

**WESTERN AUSTRALIAN**

**YEAR BOOK**

**1982**

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WESTERN AUSTRALIAN YEAR BOOK

LONG-TAILED DUNNART (*Sminthopsis longicaudata*)

It is a small animal, soft-furred and about the size of a domestic mouse but there the similarity ends. With its pointed snout, large darting eyes and sharp teeth it is an aggressive little ball of energy, by night leaping and scrambling with ease over its rocky habitat, maintaining its balance with the help of an extraordinary tail — twice the length of its combined head and body.

Despite its distinctive tail, the Long-tailed Dunnart has eluded biologists for the past century to the extent that it was classified as one of Australia's rarest marsupial mice. That is, until early in 1981 when a colony was discovered in the Gibson Desert by members of the Western Australian Wildlife Research Centre.

(The State Wildlife Authority News Service)

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# WESTERN AUSTRALIAN YEAR BOOK

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W. M. BARTLETT

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## PREFACE

This is the twentieth issue of the present series of the *Western Australian Year Book*. The old series, originally published for the year 1886 and discontinued in 1905, developed from the Blue Books of the Colonial Office, London, which contained the earlier statistical records of Western Australia.

The Year Book provides a general description of Western Australia and includes authoritative information on almost every aspect of life in the State. Together with chapters on social and economic progress, the Year Book includes information on government, geography and climate, vegetation and fauna. Considerable use is made of statistical tables to supplement the descriptive text and, where appropriate, maps are also included for illustrative purposes. Each chapter contains the latest information available at the time of manuscript preparation.

Because of the time required for editing and printing the Year Book, later data on a particular topic will often be available in mimeographed publications or on request to the appropriate section of this Office. More detailed statistics on matters treated generally in the Year Book are available in other publications. The reader is referred to the complete list of publications of the Western Australian Office which is provided at the back of this Book.

The reader's attention is drawn to the information service and library facilities provided by this Office, where all the publications of the Australian Bureau of Statistics are available for reference. Businessmen, manufacturers, primary producers, government authorities, students and the public generally are invited to make full use of these services.

I express my appreciation to the many government officials and others for their part in the preparation of material for the Year Book. Special thanks are due to the Editor of Publications (Mr G. B. McLennan, B.Ec., B.Com.), other officers of the Bureau, and Advance Press Pty. Ltd. and Sands & McDougall (Aust.) Pty. Ltd. and their staffs for their role in the Year Book project.

I wish also to acknowledge with appreciation the contribution made to the Year Book and other publications of the Western Australian Office by the previous Editor of Publications, Miss Evelyn Binns, B.A. who retired in 1981.

W. M. BARTLETT  
Deputy Commonwealth Statistician  
and  
Government Statistician



# GENERAL INFORMATION

## Symbols

The following symbols mean:

n.a.	not available
n.e.c.	not elsewhere classified
n.e.i.	not elsewhere included
n.e.s.	not elsewhere specified
n.p.	not available for separate publication (but included in totals where applicable)
n.y.a.	not yet available
p	preliminary — figure or series subject to revision
r	figure or series revised since previous issue
..	not applicable
—	nil or rounded to zero
—	break in continuity of series (where drawn between two consecutive figures or columns)

## Other forms of usage

**Rounding.** Where figures have been rounded, discrepancies may occur between sums of the component items and totals.

**Citation of Acts.** Acts of the Parliament of Western Australia are cited in italics throughout. The dates indicate the year of original enactment and the year of latest amendment.

Acts of the Parliament of the Commonwealth of Australia are cited in italics with the year of original enactment in roman type; all subsequent amendments are inferred.

## Availability of ABS publications

Information regarding the availability of ABS publications can be obtained from the Information Services Section, Australian Bureau of Statistics, 1-3 St George's Terrace, Perth, W.A. 6000, or from other ABS Offices.

All publications produced by the Western Australian Office of the ABS are described in List of Publications (Catalogue No. 1101.5) which is available free of charge from this Office.

The Catalogue of Publications issued by Central Office provides a comprehensive list of all statistical publications issued by the ABS. This is available free of charge from any ABS Office.

In many subject areas there is a considerable amount of unpublished statistical information which is available on request. Inquiries should be made to the Information Service at this Office.

## **CHAPTER I—PRE-HISTORY, EUROPEAN DISCOVERY AND EARLY SETTLEMENT**

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## CHAPTER I—PRE-HISTORY, EUROPEAN DISCOVERY AND EARLY SETTLEMENT

While details of European discovery and early settlement in this chapter of the Year Book relate mainly to the activities of European sailors, explorers and settlers, Western Australia had been inhabited by the Aborigines for many thousands of years before Europeans discovered the land.

### ABORIGINES, PRIOR TO EUROPEAN SETTLEMENT

*Contributed by*

*I. M. Crawford, M.A., Ph.D.*

*(Head of Division of Human Studies, Western Australian Museum)*

The date of arrival of the ancestors of the Aborigines remains a matter of speculation. There is no doubt that they came from South-East Asia, and the crossing would have been facilitated at a time of low sea level. Possible routes were across the Timor Sea, then a comparatively narrow channel, or through New Guinea to Cape York having previously crossed the trough at the Wallace line. The ability to cross by either route implies the ability to make some form of water craft, and it is generally held that the development of such skills postdated the evolution of *homo sapiens*. For this reason, it is held, Australia was not colonised during the earlier hominid evolution. As sea levels were generally below present level back to 120,000 years ago, the crossing or crossings may have taken place at virtually any time within that period, but it is tempting to correlate them with the very low sea levels, estimated to have occurred at about 17,000 and between 50,000-58,000 years ago, or with the not so low levels 30,000-39,000 years ago.

The earliest fully-established dates for Aboriginal occupation of Australia are associated with stone artifacts in a terrace of the Swan River near Midland. This site has been dated by the radio active carbon 14 method to about 38,000 years ago. That date is little greater than those for Lake Mungo in N.S.W., and together they imply the colonisation of Australia at the beginning of the then existing low sea level period, or during the preceding low sea level commencing roughly 50,000 years ago. Other early evidence is more equivocal. Mammoth Cave in the south-west has produced a repetitive pattern of bone breakages, an incised bone and charcoal possibly from cooking fires in deposit older than 37,000 years. The faunal remains include many extinct species (so-called 'giant fauna'). Stone artifacts from the terraces of the Murchison may also be associated with extinct fauna, and may prove to be of considerable antiquity. Other established dates of interest because of their age come from Devil's Lair (occupied 33,000 to 8,000 years ago), 26,000 years ago at a rock shelter at Newman in the Pilbara and 18,000 years ago at Miriwun Rock Shelter in the Ord Valley, Kimberley.

In the southern half of the Continent, significant additions to the stone working technology took place some 5,000-6,000 years ago, and these are reflected in the archaeological discoveries of small delicately worked tools called geometric microliths.

Aborigines had developed specialised technologies to capitalise on local and regional environments. Thus, for example, the implements from Kimberley, the Western Desert and the south-west are quite distinctive. Extensive exchange systems ensured the supply of raw materials to areas where these were deficient. Aborigines, by burning the bush had learnt to manage the land to optimise conditions for grazing animals such as kangaroos. From Kimberley down the coast to Geraldton, they ensured the continuation of root crops by replanting the growing nodes of yams and thus practised a form of incipient agriculture.

EUROPEAN DISCOVERY AND EARLY SETTLEMENT <sup>(1)</sup>

*Terra Australis Incognita*, or *Magellanica*, the unknown Southern Continent, or Great Southern Land of ancient geographers and explorers, is said to have been first discovered by the Portuguese between the years 1511 and 1529, when some vessels belonging to that nation, engaged in the exploration of the Indian Seas, driven out of their course by currents or stress of weather, accidentally drifted on to the Australian coast. The authenticity of this account is, however, doubted.

In 1567 Alvaro de Mendana sailed from Callao, in Peru, in search of the Continent believed to exist in the Southern Seas, but the only result of the expedition was the discovery of the Solomon Islands.

In 1595 Mendana again left Peru in charge of an expedition equipped for the purpose of colonising the Solomon Islands, previously discovered, and chanced on the Marquesas and Santa Cruz Islands. He died on one of the latter, the expedition returning to Peru.

The spirit of enterprise displayed by the Portuguese served, however, to encourage the Dutch East India Company, with their already established factories in Java and other parts of the Indian Archipelago, to researches in the direction of Australia. Their first object was New Guinea, where it was rumoured that gold was found. Frederick de Houtman, Governor of Amboyna (in the Moluccas), organised an expedition in 1605. Under his instructions the Dutch yacht 'Duyfken' (*Little Dove*), Commander Willem Jansz, supercargo Jan Lodewijkszoon Rosingeyn, sailed from Bantam on 18 November of that year, whence, after receiving further instructions from Jan Willemsz Verschoor, the company's President, she sailed to explore the island of New Guinea. During March in the following year she coasted along that portion of *Terra Australis* lying in the Gulf of Carpentaria to the south-west of Cape York, as far as Cape 'Keer Weer', or 'Turn Back', her commander mistaking it for the west side of New Guinea, and thus, unconsciously, making the first authenticated discovery of the long sought-for Southern Continent. These seem to be all the particulars available as the results of this expedition, and even they are doubtful, as the journal of Captain Jansz unfortunately appears to have been lost.<sup>(2)</sup>

On 21 December 1605, Pedro Fernandez de Quiros, who had been pilot under Mendana and Luiz Vaz de Torres, left Callao with three Spanish vessels in search of the supposed *Tierra Austral*, and amongst others discovered one of the islands now called the New Hebrides, to which, supposing it to be the object of their search, they gave the name of *Australia del Espiritu Santo*. Torres, in the 'Almirante', on 11 June 1606, found himself separated from de Quiros and, ascertaining that the newly discovered land was only an island, continued his search westward, passing, also unconsciously, in sight of the sought-for continent, through the Straits that now bear his name.

In 1611 certain ships going from the Netherlands to India, after doubling the Cape, followed another route than that usually adopted: they ran on an eastern course, in about 36° southern latitude, for a considerable time, and then tried to navigate to Java on a northerly course. The commander, the subsequent Governor General Hendrik Brouwer, wrote to the Directors of the East India Company concerning 'this fairway' in highly laudatory terms, as preferable to the usual course by Madagascar, which offered many dangers and objections. The new route was thenceforth prescribed to the Company's ships. As early as 1618 and 1620 the Company urged upon the Governor General of India the importance of following up the discoveries in the region

<sup>(1)</sup> Reprinted, with minor editing, from the *Western Australian Official Year Book*, 1905 (Old Series). To preserve the historical nature of the text and maintain the verbatim reproduction of the excerpts of letters or reports quoted, references to imperial measures have been retained rather than insert the current metric equivalent. Similarly monetary amounts appear in their original form in preference to existing decimal currency. <sup>(2)</sup> Dr W. G. C. Byvanck, the Chief Librarian of the Royal Library at The Hague, who kindly furnished authentic information with regard to the early Dutch voyages to Western Australia, quotes De Jonge, 'Rise of the Dutch Dominion in East India', iii., 42-4, and Lants, also P. A. Leupe, 'Voyages of the Dutch to New Holland' (in his 'Treatise on the Naval Exploits of the Dutch'). Professor Dr J. E. Heeres, of Leiden, in an abstract of valuable notes kindly made available for publication in the Year Book, gives a similar account.



of 'The Southland'. Jan Pieterszoon Coen, who was then directing the affairs of the Company in India, gave instructions, on 29 September 1622, for the ships 'Haring' (*Herring*) and 'Hazewind' (*Greyhound*) to sail, 'destined for the further discovery of the Southland'. The commanders were 'specially to inquire what minerals, such as gold, silver, tin, iron, lead, and copper, what precious stones, pearls, vegetables, animals, and fruit these lands produced; and the countries discovered were 'to be taken possession of'. Jan Carstensz was to be in command. The ships, however, for some reason did not sail on their ordained expedition. The enterprise of the Company probably found its boldest expression in that eminent navigator, Van Diemen; but in his time the Directors of the Company began to slacken in their zeal for exploration, finding the expenses too great; and gradually the idea of further colonial expansion was abandoned, thus leaving Australia to be colonised by others. At the close of the 17th century Nicolaas Corneliszoon Witsen, Burgomaster of Amsterdam and General Director of the East India Company, with a special view to the enlargement of geographical knowledge, took a diligent part in the preparations for the voyage of skipper de Vlaming. A few years later he bitterly complained of the indifference of many of his countrymen in those days, who did not 'care about curious learning from India', but 'money only'. As Professor Heeres says: 'the times of Van Diemen had failed to return; the spirit by which he was imbued no longer presided over the debates on colonial matters.'<sup>(3)</sup>

In 1616 Dirk Hartogs (Hartochsz), in command of the Dutch vessel 'Eendragt', or 'Eendracht' (*Concord*), supercargo Cornelis Buysero, outward bound from Holland to the Indies, entered Shark Bay, and gave his name to the island upon the western side of the Bay. The name 'Dor Eylandt', or 'Dorre Eylandt' (*Barren Island*) was then, or subsequently, given to the largest island at the entrance of the Bay. A tin plate nailed to a post erected at the north end of Dirk Hartogs Island remained for many years a memento of his visit. His countryman, Willem de Vlaming, who visited the island in 1697, relates that he found the plate on 4 February of that year and, taking it away with him, entrusted it to the Governor General at Batavia, who forwarded it to the Board of Seventeen Directors of the Dutch East India Company in Holland, the President of which was, at that time, Burgomaster Nicolaas Witsen. Vlaming gave a rendering of the inscription, which, translated from the Dutch, runs as follows:

'ANNO 1616, the 25th of October.— Arrived here the ship "Eendracht", of Amsterdam; the first merchant Gillis Miebaits of Liege. Dirck Hartogs, of Amsterdam, Captain. 27 Do.— Sailed for Bantam.'

On the lower part, cut with a knife, were to be read in Dutch the words:

'The Under Merchant Jan Steyn, Upper Steersman, Pieter Ledoecker of Bil. A° 1616.'

Such, at least, was the wording of the duplicate plate which he caused to be substituted for the one removed.<sup>(4)</sup> The original plate of Dirk Hartogs was discovered in 1902 by Mr J. F. L. De Balbian Verster, in the 'Rijks-Museum' (State Museum) at Amsterdam, and it was then seen that the latter part of the inscription thereon reads as follows:

'The Under Merchant Jan Stins, Upper Steersman, Pieter Dockes of Bil. A° 1616.'

Vlaming's inscription was seen by Captain Hamelin, of the French exploring vessel 'Naturaliste', in 1801; but the plate had disappeared in January 1822, when King caused a careful search to be made for it. This disappearance can be accounted for by a statement made by de Freycinet to the effect that he had removed it and deposited it for safe keeping in the Museum of the French Institute, which fact is referred to in the minutes of the Society, dated 23 March 1821. In spite, however, of this statement, a careful search subsequently at the turn of the century made by the Secretary<sup>(5)</sup> of the Institute failed to discover its whereabouts. [The plate was located by chance in 1940 and is now held by the Fremantle Branch of The Western Australian Museum — Ed.]

<sup>(3)</sup> 'The Part borne by the Dutch in the Discovery of Australia, 1606-1765', by Professor J. E. Heeres, LL.D.

<sup>(4)</sup> Dr Byvanck refers to Major's 'Introduction' to 'Early Voyages to *Terra Australis*', p. 32. <sup>(5)</sup> Dr Alfred Grandidier, who has kindly revised the portions of this historical abstract, referring to the French voyages.

Dirk Hartogs examined the coastline between south latitude 26°30' and 23°, and called the intervening country 'Eendracht's Land'.

On 11 May 1618, the ship 'Zeewolf' (*Seawolf*), from the Netherlands to India, supercargo Pieter Dirkszoon, skipper Haevik Claeszoön Van Hillegom, sighted land in southern latitude 21°20', about 'a thousand miles' (German sea miles) east of Africa.

In July of the same year a Dutch vessel called 'Mauritius', supercargo Willem Jansz, skipper Lenaert Jacobsz, touched near North West Cape, and discovered the 'Willemsrivier' (probably the Ashburton), in latitude 21°45' south.

In 1619 a fleet of eleven vessels, under the command of Frederik de Houtman, in the ship 'Dordrecht', discovered, on 29 July of that year, a reef lying off this coast, to which the name of 'Frederik Houtman's Abrolhos' was given. <sup>(6)</sup> It consists of a cluster of rocky islets and outlying reefs about forty-five miles to the west and north-west of Champion Bay. The term Abrolhos is a contraction of the Portuguese words 'abri vossos olhos', meaning in English 'Open your eyes', and was applied by the Portuguese to outlying coastal dangers. On board one of the ships of Houtman's fleet, the 'Amsterdam', was Jacob D'edel, the first merchant (supercargo), and it was after him that the district between Shark Bay and Champion Bay was named 'Edel's Land'.

In 1622 the Dutch vessel 'Leeuwin' (*Lioness*) rounded the Cape at the south-west corner of the continent which now bears her name, and examined the shore as far as what subsequently become known as King George III Sound; this portion of the continent being subsequently known as Leeuwin's or Lyon's Land.

On 5 July 1622, a boat arrived at Batavia with ten men, forming part of the crew of an English ship named the 'Trial', and on 8 July her pinnace arrived with thirty-six men. They stated that they had lost and abandoned their ship with ninety-seven men and the cargo on certain rocks situated in latitude 20°10' south, in the longitude of the western extremity of Java. These rocks were near a number of broken islands lying very far apart. They said that they had met with this accident through following the course of the Dutch ships. The yacht 'Hazewind' was selected to discover those lands, but never started. It is probable that the shipwrecked English sailors were considerably out in their statement as to the longitude of the 'Trial' or 'Tryal' rocks, which have since been located on the south-western part of the Monte Bello Reef, extending three or four miles north and south, the central and largest rock lying north, distant 5¼ miles, from the north extreme of Barrow Island.

On 22 July 1622, the Dutch ship 'tWapen van Hoorn' (*The Arms of Hoorn*), having sailed from the Texel on 22 December 1621, arrived at Batavia, and reported that she had been in extreme peril near Eendachtsland.

On 21 July 1623, the Dutch ship 'Leyden', skipper Klaas Hermansz, sighted Eendachtsland. This same ship, under the command of Daniel Janssen Cock, sighted 'The Southland' on 28 April 1626.

On 16 November 1623, the yacht 'Tortelduyff' (*Turtledove*) sailed from the Texel and, during her voyage to Batavia, where she arrived on 21 June 1624, probably discovered and named the Turtledove Shoal.

In January of the same year, 1623, an expedition under Jan Carstensz, from Amboyna, in the vessels 'Pera' and 'Arnhem', discovered Arnhem Land (Aarnems land). The skipper of the 'Arnhem', Dirck Melisz, having been killed in an attack by natives, the second mate of the 'Pera', Willem Joosten Van Coolsteerd, was appointed as his successor. 'In this discovery were found everywhere shallow water and barren coasts; islands altogether thinly populated by divers cruel, poor, and brutal natives, and of very little use to the company.' This exploration was, in April 1636, continued by Gerrit Thomaszoon Pool, who was also murdered by natives at the same spot, and Pieter Pieterszoon, in the yachts 'Klyn Amsterdam' and 'Wezel'.

<sup>(6)</sup> Dr Byvanck refers to Major's 'Introduction', p. 86, and the strictures on the passage given by P. A. Leupe, 'Treatise on the Naval Exploits of the Dutch', vol. xxvii. 1. sec. 2, p. 32.

On 16 January 1627, according to De Hondt, or 26 January to Thevenot's chart, the 'Gulde Zeepaerd' (*Golden Sea Horse*), skipper Francois Thyssen, having on board Pieter Nuyts, afterwards Ambassador to the Court of Japan, and subsequently Governor of Formosa, sighted the south coast of 'The Great South Land' near the present Cape Leeuwin, and made a close examination of the southern coastline for 1,000 miles, to Nuyts' Reef. Nuyts gave the name Nuyts Land to the country lying round what is now known as the Great Australian Bight. It was on this voyage also that the islands St Francois and St Peter in Nuyts Archipelago, off the coast of South Australia, were named.

On 22 July 1627, the Governor General of Dutch India, Jan Pieterszoon Coen, sailed from Table Bay with the ships 'Galias', 'Utrecht', and 'Texel'. The 'Galias', having broken her rudder in a gale on the night of 10 August, parted company from the other ships, and on 5 September was nearly wrecked on the coast of Eendrachtsland.

On 17 September of the same year the ship 'tWapen Van Hoorn', supercargo J. Van Roosenbergh, sighted Eendrachtsland, near Dirk Hartogs Roadstead. Fresh observations were made during each of these voyages, and the coast consequently became more accurately defined on the map.

In 1628 an expedition was equipped in Holland, bound for the East Indies. It had originally been intended that the fleet should consist of eleven vessels, but three of them, being ready to sail before the others, left Texel on 28 October, under the command of Commodore Francis Pelsart. The 'Batavia', Pelsart's ship, driven out of her course during a severe storm, was separated from the other two and having lost her reckoning, struck, on the night of 4 June 1629, on one of the islands of Houtman's Abrolhos, becoming a total wreck. The greater part of the crew and passengers, however, safely reached the shore. After vainly searching for water on the adjacent islands and the mainland opposite, Pelsart, with eight men, eventually made his way in one of the vessel's boats to Batavia, where he arrived on 5 July; here he obtained the use of a frigate called the 'Sardam', in which he returned to rescue the remainder of the castaways. On his arrival he found that during his absence a portion of the crew, under the supercargo, Jerome Cornelis, had mutinied and massacred the greater number of the passengers, intending to seize any vessel that might chance to come near the islands, and then turn pirates. Pelsart, being forewarned of this intention by some of those who had escaped from the mutineers to another island, easily captured the ringleaders, who were promptly tried and as quickly executed, two of their number being marooned on the mainland near Champion Bay. On 28 October 1629, the chief part of the silver treasure having been recovered from the wrecked vessel, the 'Sardam', with the survivors on board, sailed for Batavia. Pelsart's Journal mentions the so-called 'Jacob Remessens', 'Remens', or 'Rommer', River, in latitude 22°17'. As the modern maps show no river of any size at that point, it may perhaps be surmised that Exmouth Gulf was mistaken for the mouth of a river. It is evident that the name 'Jacob Remessens River' had been given in or before 1628.

In the same year, 1628, Captain Gerrit Fredericksz de Wit, of the homeward bound 'Vianen', ran aground off the land which is now comprised in the North-West and Kimberley Districts, and sailing along the coast for about fifty miles, gave his name to that part of Australia.

In 1629 the west coast of Australia was touched at by Dutch vessels in the neighbourhood of Dirk Hartogs Roadstead.

In 1632 the Trials were passed by Dutch ships on the outward voyage, but no fresh information of importance was gained.

In 1635, on 25 May, the ship 'Amsterdam', under Commander Wollebrand Geleynszoon de Jongh, and skipper Pieter Dirksz, sighted the 'Southland' in the neighbourhood of Shark Bay.

In 1644 Abel Janszoon Tasman, the celebrated Dutch explorer, and Franz Jacobszoon Visscher, with the yachts 'Limmen', 'Zeemeeuw' (*Sea-mew*) and 'De Brak' (*The Hound*) during a

second expedition in these seas, examined the country which was afterwards called Tasman Land, to that bordering on the extreme north-western coast line of the continent, from Arnhem Land, or what is now the Northern Territory, to Exmouth Gulf, in latitude 22°S, in this State. This comprised the country previously discovered, and named by de Wit, as well as part of Eendracht's Land — namely, the present districts of Kimberley and the North-West. Tasman appears to have landed in Carnot Bay and also in what was subsequently called Roebuck Bay, and on some of the islands in Dampier's Archipelago. He gave the name of *Nova Hollandia* or *New Holland* to the western half of the continent of Australia. The name New Holland was applied by the Dutch only to the parts of the continent lying westward of a meridian line, passing through Arnhem Land on the north and near the isles of St Francis and St Peter to the south. All that to the eastward, including the shores of the Gulf of Carpentaria, still remained as *Terra Australis*. This appears from a chart published by Thevenot in 1663, which, he says, 'was originally taken from that done in inlaid work upon the pavement of the new Stadt-House at Amsterdam'.

In the present State of Western Australia are included all the lands on the south, west, and north-west coasts then known to the Dutch as 'The Great Known South Land', as distinguished from the 'The Unknown Land', which comprised the remainder of the continent.

An exploratory voyage to the west coast of New Holland was made in 1648 by the ship 'Leeuwerik' (*Lark*), commanded by Jan Janszoon Zeeuw.

In 1656, on 28 April, the 'De Vergulde Draeck' (*The Gilt Dragon*), commanded by Pieter Albertsz, which had left Texel on 4 October 1655, was wrecked at night on a reef on the west coast in latitude 30°40', and 118 lives were lost. Leaving sixty-eight of the survivors of the wreck behind on the mainland to protect, if possible, the treasure (78,600 guilders) and merchandise, which comprised the cargo of the vessel, one of the ship's boats made for Batavia, which it duly reached; and the vessels 'Witte Valck' (*White Falcon*) and 'Goede Hoop' (*Good Hope*) were at once despatched to the rescue of the castaways and the property, unfortunately, however, without success.

In 1657 a further search made by the 'Vinck' (*Finch*), while on a voyage from the Cape to Batavia, also proved fruitless.

In 1658, on 1 January, the vessels 'Waekende Boey' (*The Watch Buoy*), commanded by Samuel Volckertszoon, and the 'Emeloort', Captain Aucke Pieterszoon Jonck, left Batavia on a similar errand, which was equally abortive. Improved charts of the west coast of Australia were, however, the result of the expedition. During the search, one of the boats of the 'Waekende Boey', being accidentally separated from her during bad weather, was thought by those on board to have been lost, and was consequently abandoned; part of its crew, however, after almost incredible sufferings from exposure, hunger, and thirst, managed to reach Java in safety.

In the same year the ship 'Elburg', commanded by Jacob Pieterszoon Peereboom, brought in further reports about the south-west coast, or 'Land van de Leeuwin', where she had been at anchor 'in latitude 33°14' south under a projecting point', probably in Geographe Bay, and where some of her crew had been ashore.

In February 1678, the ship 'De Vliegende Zwaan' (*The Flying Swan*), commanded by Jan Van der Wall, coasted the north-west of Australia on her voyage from Ternate to Batavia.

In 1688, on 5 January, the first Englishman landed on the coast of Western Australia, in the person of William Dampier, who, by the publication of further authentic information regarding 'New Holland', supplemented the accounts of Tasman's discoveries made in 1642-3, which had already been made known, in 1671 in the diary kept by the surgeon of Tasman's vessel, and subsequently in Tasman's own notes in 1674. Dampier appears to have left Brazil as supercargo in a small vessel called the 'Cygnet', commanded by a friend of his named Swan, and intended for the trade with South America; the crew, however, mutinied and became



buccaneers, and eventually Captain Swan and about forty of those who remained faithful to him were abandoned to their fate on one of the Philippine Islands. Dampier remained in the vessel which, after her extended voyage, appears to have required overhauling. Their occupation rendering an unfrequented spot desirable for the purpose, the buccaneers steered for the coast of New Holland, and on 4 January 1688, anchored in a bay in the north-western corner of King Sound, in the present West Kimberley District, now known as Cygnet Bay, where they beached the vessel and executed the necessary repairs. During their stay here (and they did not leave until 12 March) Dampier, who does not seem to have found the society of the buccaneers or their mode of life congenial, made a careful exploration of the surrounding country. He succeeded in leaving the vessel at the Nicobar Islands, from which he reached Sumatra in a canoe, and eventually, after many adventures, arrived in England. It has been pointed out as a singular circumstance that Cygnet Bay, where the 'Cygnet' was beached in 1688, was the one spot out of the whole Western Australian coast subsequently selected by the W.A.S.N. Co's steamers for scraping and cleaning their bottoms; and it certainly seems strange, unless the place was previously known, that the 'Cygnet' should accidentally have hit upon the one place on the whole coast best suited for the purpose.

In 1696 Commander Willem de Vlaming, in a vessel called the 'Geelvinck' (*Yellow Bunting*), convoying two other vessels, the 'Nyptangh' (*Pincher*), commanded by Captain Gerrit Collaert, and 'Weseltje' (*Weazel*), under Commander Cornelis de Vlaming, son of the leader of the expedition, was ordered by the Dutch East India Company to carefully examine the western coast of New Holland for traces of a vessel named the 'Ridderschap Van Holland' (*Chamber of Knights of Holland*), which had left Holland for the Dutch colonies two years previously (1694)<sup>(7)</sup> and had never reached its destination. On the morning of Christmas Day, 1696, land was sighted, and on 29 December the ships anchored off the island of Rottnest, which the next day they explored, giving it the name 'Rottenest' from the abundance of rats' (wallabies) nests found upon it. On the morning of 5 January, Vlaming landed on the mainland, probably somewhere about what is now called Cottesloe Beach, with a party of eighty-six men, fully armed, and marching eastwards, came to what is described as 'a large basin of brackish water, which we afterwards found was a river'. On the banks of this they found a hut 'of a worse description than that of a Hottentot', also footprints and other evidences of the inhabitants, of whom, however, they were unable to catch a glimpse. On the following day the party divided into three, and went in different directions — one north, one south, and the third four miles further east. On 9 January the ships were brought in and anchored close off the mouth of the river, which Vlaming himself is said to have explored for a distance of fourteen or sixteen leagues. It is mentioned that he caught some smelts, while on the surface of the water were seen numerous black swans. Of this hitherto unknown prodigy, the fabulous black swan, Juvenal's '*Rara avis in terris nigroque simillima cygno*', Vlaming captured several specimens, three of which were taken alive to Batavia. The river was named by Vlaming the Swan River (*Swaenerevier*), on 13 January, having, as it is reported, found 'neither good country nor seen anything worthy of note', the expedition proceeded slowly northwards, examining the shore carefully with the boats for traces of the lost ship, and occasionally landing and making short excursions inland. On 4 February Shark Bay was reached and carefully explored. The tin plate of Dirk Hartogs was discovered and, leaving a somewhat similar memorial of their own visit, the ships, on 12 February, proceeded as far as North West Cape, from which, on 21 February, they steered a direct course to Batavia. Burgomaster Nicolaas Witsen complained that Vlaming, being addicted to drink, did not make such a thorough exploration of the country as he was instructed to do.

In 1699 Dampier — who, since his arrival in England, had published accounts of his previous adventures and discoveries in New Holland — was sent by William III in the

(7) Leupe, p. 360.

'Roebuck', under an Admiralty Commission, to make further explorations on the north-west coast of that country, and to solve, if possible, the question as to whether it was a continent or, as was then generally supposed, only a succession of islands. On 1 August 1699, he entered and named Shark Bay and here he spent eight days in a fruitless search for water. Frequent further attempts for a like purpose, as he proceeded slowly northward up the coast, were also of no avail, and only once was water obtained in a sufficient quantity to replenish his supply. So greatly disgusted was he with the extreme sterility and waterless aspect of the coastal country — he never appears to have explored any distance inland — that he abandoned the object of his mission and proceeded straight to New Guinea. His unfavourable comments on the barren appearance of the land and its wretched poverty-stricken inhabitants — whom he described as 'the miserablest people in the world' — militated strongly against further investigation being made, and from that time to 1770 — when Cook, landing at Botany Bay, discovered and took possession of the more fertile regions of the eastern coast — Australian exploration, so far at all events as England was concerned, appears to have been neglected. During this voyage Dampier discovered and roughly charted the Dampier Archipelago, and added much to the knowledge of the habits and customs of the Aborigines and the natural history of the country. He described the kangaroo as 'a strange creature like a racoon, which used only its hind legs, and, instead of walking, advanced by great bounds or leaps, of twelve or fifteen feet at a time'.

In March 1705, a small Dutch exploring squadron of three vessels, the 'Vossenbosch' (*Foxwood*) under Maarten Van Delft, 'De Wayer' (*The Fan*) under Andries Rooseboom of Hamburg, and 'Nieuw Holland' under Pieter Hendrikszoon of Hamburg, left Timor to explore the north-western coast of New Holland, and an improved chart of Tasman's explorations was made.

In 1711 a Dutch vessel named the 'Zuytdorp' (*The South Village*) is said to have been wrecked on the Abrolhos Islands.

In 1727, on 9 June, a Dutch vessel, commanded by Jan Steyns, supercargo, Jan Nebbens, the 'Zeewyck', so named after a small fishing village in Holland, was wrecked on a reef off the Houtman Abrolhos, near the island to which, in 1840, Captain Stokes gave the name of Gun Island, from the fact of his finding a small brass three-pounder gun on it, with other relics of the wrecked vessel. Leaving the island on 26 March 1728, the remainder of the crew of the 'Zeewyck', eighty-two in all, taking with them ten chests of treasure valued at 315,836 florins, reached Batavia in safety, on 21 April, in a small boat built out of fragments of the wreck. A boat previously despatched in charge of the upper steersman, Pieter Langeweg, with a crew of eleven, was never heard of again. Numerous relics of the wreck have since been discovered, including pieces of ordnance, cannon balls, clay pipes, broken gin bottles, tumblers, wine glasses, iron lamps, snuff-box, etc. and several silver and copper coins bearing date 1720 and 1722.

Later in the eighteenth century, *inter alia* in 1755 and 1765, the west coast of Australia was again visited by Dutch ships, but the information gained by these visits is unimportant.

On 18 March 1772, Captain de St Alouarn, in the flute 'Le Gros Ventre', anchored off Cape Leeuwin. After him the St Alouarn Islands were named by d'Entrecasteaux, in December 1792.

In 1791, on 1 April, Captain George Vancouver, who had previously served as a midshipman under Cook, left Falmouth in H.M.S. 'Discovery', accompanied by Captain Broughton, in H.M.S. 'Chatham', on his way to north-west America. On 26 September he arrived at Lyon's Land, off Chatham Island, situated close to the mainland off Point Nuyts, about one hundred miles south-east from Cape Leeuwin. Making a careful survey of the coast as he proceeded eastward, on the night of 28 September he anchored in a sound, to which he gave the name of King George the Third Sound. Landing on 29 September, the birthday of the then Princess Royal, after whom the inner harbour was named, he formally took possession of the

country from the land seen north-westward of Cape Chatham, so far as he might explore its coasts. Here he remained until 11 October, being especially minute in his survey and examination of its outer harbour, and the adjacent country. Before leaving he deposited on Point Possession a bottle containing a parchment record of his visit, and a similar one on Seal Island. Continuing his voyage, adverse weather greatly interfered with his exploration of the coast which, at Termination Island, he eventually quitted for America. Archibald Menzies was naturalist to the expedition.

In 1792 a French expedition of two vessels, one 'La Recherche', commanded by Antoine Raymond Joseph de Bruni Chevalier d'Entrecasteaux, and the other called 'L'Esperance', Captain Huon de Kermadec, appeared on the south-western coast, looking for traces of Count Jean Francois La Perouse who, early in 1788, had left Sydney with the vessels 'Boussole' and 'Astrolabe', the latter commanded by Captain de Lange, and whose fate remained a mystery for nearly forty years, until 1825, when Captain Peter Dillon, of H.M.S. 'Research', discovered remnants of the wrecks on Vanikoro, or Matlikoro, an island to the north-west of the New Hebrides, being the southernmost of the Santa Cruz group. D'Entrecasteaux died on board his ship 'La Recherche' on 20 July 1793. Monsieur Labillardiere was naturalist to the expedition.

In 1800, on 27 August, Chr. Dixon, ship 'Elligood', was in Oyster Harbour, King George Sound. He probably removed Vancouver's bottle and record memorandum from Seal Island.

In 1801, on 18 July, Captain Matthew Flinders left Spithead in the 'Investigator', the old 'Xenophon', a sloop of 334 tons. He reached, on 6 November, what he denominated Cape Leeuwin, as being the south-western and most projecting 'part of Leeuwin's Land', and commencing from there to King George III Sound, where he arrived on 9 December, he explored the intermediate coast, charted Princess Royal Harbour, established friendly relations with the Aboriginal inhabitants, and subsequently carefully examined the whole of the southern coast of the continent as far as Bass Straits. On board the 'Investigator' was Robert Brown, the well-known naturalist; also William Westall, the famous painter; whilst John Franklin, who afterwards became Governor of Van Diemen's Land, and finally ended his career as the celebrated, but unfortunate, Arctic explorer, was one of her junior lieutenants. Flinders' search for Vancouver's record bottles was unsuccessful, but he discovered on the east side of Oyster Harbour a garden and a piece of sheet copper inscribed 'August 27, 1800. Chr. Dixon — ship Elligood'. He also placed a record bottle on Seal Island. He left the Sound on the morning of 5 January 1802. Flinders readopted the original name of the continent *Terra Australis*, 'to include New South Wales, New Holland, and the adjacent isles, including that of Van Diemen'.

In the British Patent to the first governor of New South Wales a meridian nearly corresponding to the ancient line of separation between *New Holland* and *Terra Australis* was made the western limit of that colony, and was fixed at 135°E. longitude, 'from which the British Territory extends eastwards to the islands of the Pacific or Great Ocean: its northern limit is at Cape Yorke; and the extremity of the southern Van Diemen's Land is its opposite boundary'. In 1814, upon Captain Flinders' suggestion, the continent received its name of Australia, 'as being', as he said, 'more agreeable to the ear, and an assimilation to the names of the other great portions of the earth'.

In 1801-3 an exploration of the Western Australian coast made by a French expedition of three vessels — the 'Geographe', commanded by Commodore Nicolas Baudin; the 'Naturaliste', by Captain Hamelin; and a small vessel of thirty tons, called the 'Casuarina', under Lieutenant Louis Claude Desaulses de Freycinet. After a brief preliminary visit they proceeded to Timor; then returning southward, they anchored off the mouth of the Swan River (Riviere des Cygnes) which, between 17 and 22 June 1801, they explored, probably to a short distance beyond the junction of the Helena River, intending to trace the source of the main stream. The leader, M. Heirisson (an *Enseigne de vaisseau*), was however, reluctantly obliged to abandon the latter object, owing to their provisions running short. The name of one of their party being Moreau,

the name Moreau Inlet was given to the Canning River, and that of their leader to the Heirisson Islands, on which the present Perth Causeway is constructed, where they first caught sight of the black swans. They appear to have climbed Mount Eliza, and described the view obtained from there as particularly striking and beautiful. The change of soil about the present site of Guildford was noticed, and its fertility favourably commented upon. Eating, as previously Vlaming's men had also done, of the *zamia* nut, which they described as a fruit like a chestnut, some of them did not fail to experience the sickness which it subsequently causes. At the point where they abandoned their upstream journey, a distance, so it is stated, of about twenty leagues from its mouth, the river is described as being narrow, and only about seven or eight feet deep, the water being still salt. The vessels engaged on this expedition examined, so far as possible, the whole of the Western Australian coast, made a survey of Princess Royal Harbour, and took especially minute notes of the coast and land in the vicinity of the Swan River, and at Rottne Island, where they landed, and of the salt lakes which they called *Etangs Douvailedaily*, whilst the species of wallaby they found there received the name of *peramele a long nez*. Further, they explored Shark Bay and also some of the islands about Admiralty Gulf. M. Leschenault, the celebrated botanist, after whom the Leschenault Estuary, near Bunbury, and Cape Leschenault, near the Moore River, were called, was attached to this expedition, as was also M. Francois Peron, the zoologist, from whom Point Peron, south of Fremantle, received its name, whilst M. Bailly was the mineralogist. According to Captain King, 'Peron and Lesueur in Baudin's voyage extended their inquiries chiefly among the branches of zoological research; but in that expedition each department of Natural History had its separate collector, and the names of Leschenault, de la Tour, Riedle, Depuch, and Bailly will not be forgotten'.

In 1818, Louis de Freycinet, this time as captain of the 'Uranie', was again exploring off the western and north-western coasts. A minute geographical survey of Shark Bay, called by the French 'la baie des Chiens Marins', was this time completed by M. Duperrey. An account of this voyage is given by Gaudichaud, the botanist, in his 'Voyage Botanique autour du monde'.

In 1818-22, Lieutenant Phillip Parker King, in the first place in the colonial cutter 'Mermaid', eighty-four tons, and secondly in the brig 'Bathurst', 170 tons, both vessels having been specially purchased for the purpose in Sydney, carried out a careful survey of the greater part of the western coast from King George III Sound to Cambridge Gulf, and continuing along the northern coast. King's instructions from the Admiralty were to explore the yet undiscovered coast of New Holland and to complete, if possible, its circumnavigation, also to examine minutely all gulfs and openings in the northern coast for any river on that part likely to lead to an interior navigation of the continent. Mr Allan Cunningham was the botanical collector of the party, and one of the two masters' mates was Mr John Septimus Roe, afterwards the first Surveyor General of the Swan River Colony. King's charts and sailing directions still formed the basis of those in use a century later. He died a Rear Admiral in 1855.

In 1820, the 'San Antonio' (Captain Hemmans), an American trading brig, visited King George Sound, probably in search of water, sometime in the month of December.

In June 1825, the French vessels, 'Thetis' and 'Esperance', commanded respectively by De Bougainville and du Camper, were cruising about the southern coast. As it was at that time strongly suspected that France, recognising the maritime strength derived from the possession of suitable colonies, desired to found a settlement in Australia, Lieutenant-General Sir Ralph Darling, then Governor of New South Wales, acting under instructions from the Earl of Bathurst, (to whom, however, in his despatch of 10 October 1826, he reported unfavourably on King George Sound and Shark Bay for settlement, offering the opinion that the French would find it difficult to maintain themselves on so barren a coast) sent Major Lockyer, of the 57th Regiment, with a detachment of the 39th Regiment, and a party of convicts, numbering all told about eighty, to found settlements at Western Port and the Sound. The expedition, consisting of H.M.S. 'Fly' (commanded by Captain F. A. Wetherall) and the Colonial Government brigs

'Amity' (commanded by Lieutenant Festing) and 'Dragon', sailed from Sydney on 9 November 1826. The 'Amity' reached King George Sound on 25 December and the proposed settlement was established.

The troops and convicts stationed at King George Sound were, however, about four years afterwards withdrawn by order of the Home Government and the settlement was annexed to that on the Swan River by proclamation dated 7 March 1831.

In 1826, Captain James Stirling, R.N., when commanding H.M. frigate 'Success', was ordered to New South Wales on a special service which the monsoon prevented him from at once undertaking. He pointed out to Governor Darling the advantages of Swan River for settlement, and was consequently authorised in the meantime to explore that part of Western Australia which King, on the ground that it had already been visited by the French, had omitted from his survey. On 17 January 1827, having on board Mr Charles Fraser, the Colonial Botanist of New South Wales, he sailed from Sydney with a view to make up the French survey deficiencies and to examine the country in the vicinity of the Swan River. The result of his mission was detailed in a report <sup>(8)</sup> forwarded by Captain Stirling to His Excellency General Darling on 18 April 1827.

Both Captain Stirling and Mr Fraser evidently were greatly impressed with the capabilities of the newly examined country, the latter making the following entry in his journal:

'In delivering my opinion on the whole of the lands seen on the banks of the Swan, I hesitate not in pronouncing it superior to any I have seen in New South Wales, Eastward of the Blue Mountains, not only in its local situation, but in the many existing advantages which it holds out to settlers, viz.:

- 1st. The evident superiority of the soil.
- 2nd. The facility with which settlers can bring their farms into a state of culture from the open state of the country, the trees not averaging more than ten to the acre.
- 3rd. The great advantage of fresh-water springs of the best quality, and consequent permanent humidity of the soil—two advantages not existing Eastward of the the Blue Mountains.
- 4th. The advantage of water carriage to their own doors, and the non-existence of impediments to land carriage.'

The favourable report made by Captain Stirling, backed up by the glowing description given by Mr Fraser, induced General Darling to recommend the Home Government to at once establish a settlement.

To Captain James Stirling, who appears to have conveyed the recommendation in person to England, the charge of organising the expedition was entrusted by the English Government.

No commission was at that time issued to Captain Stirling as Lieutenant-Governor of Western Australia, who instead received a letter of appointment, bearing date 30 December 1828; the earliest commission issued to him was that appointing him to be Governor and Commander-in-Chief, which was dated 4 March 1831. The reason for the adoption of this course is explained in the despatch <sup>(9)</sup> from Secretary Sir George Murray, addressed to him on the same date as the first letter of appointment, and instructing him as to the course to be followed in the formation of the then proposed settlement.

In 1829, on 2 May, Captain Chas. H. Fremantle, of H.M.S. 'Challenger', who, under instructions from the Admiralty, had been despatched from the Cape of Good Hope on 20 March of that year by Commodore Schomberg, of the Indian Squadron, for the purpose, anchored off the mouth of the Swan River and, hoisting the British flag on the south head, took formal

<sup>(8)</sup> The 'Narrative of Operations' from the report is shown in the *Appendix* of the 1974 Year Book. <sup>(9)</sup> For despatch in full, see the *Western Australian Year Book*, 1902-04, (Old Series), p. 16.

possession in the name of His Majesty King George IV of 'all that part of New Holland which is not included within the territory of New South Wales'.

Exactly one month later, on 2 June, the hired transport 'Parmelia', 443 tons, J. H. Luscombe, commander, arrived in Cockburn Sound, having on board Lieutenant-Governor Stirling, his family and other intended settlers, numbering in all seventy. Six days later, on 8 June, her consort H.M.S. 'Sulphur', arrived with a detachment (Light Company No. 2) of the 63rd Regiment, consisting of three subalterns, one staff officer, two sergeants, three corporals, one bugler and forty-six men, under the command of Captain F. C. Irwin. Having left a party of about half its strength to protect the stores, settlers, etc. on Garden Island, the remainder of the force, on 17 June, disembarked, and encamped on the north bank of the Swan subsequently named Rous Head, relieving the party of seamen and marines from the 'Challenger', which had been left to protect the British flag planted there by Captain Fremantle during the preceding month. With the landing of the immigrants from the 'Parmelia', the history of Western Australia, as a British Colony, begins.

An interesting account of the arrival of the first settlers was contained in a despatch sent by Captain Fremantle to the Admiralty, from Trincomalee, on 8 October 1829. <sup>(10)</sup>

The names which were originally given to the most prominent features on the western coast are still in most instances retained and serve to perpetuate the memory of many of the earliest explorers, their vessels, and the principal officers of their crews.

Directly the intention of the Imperial Government to establish the Swan River Settlement became known, a proposal was, on 4 November 1828, made by a syndicate consisting of the following gentlemen — Mr Thomas Peel, Sir Francis Vincent, Bart., Mr Edward W. H. Schenley and Colonel T. Potter Macqueen, M.P., to send out and settle in the neighbourhood of the Swan River 10,000 of His Majesty's subjects from England, Ireland and Scotland and to find them in provisions and every other necessity usually allowed to emigrants; also to bring to the settlement 1,000 head of horned stock and to arrange for three small vessels to subsequently run between Sydney and Swan River, as occasion might require; the undertaking to be completed within four years. In payment of their expenses, estimated at £30 per head of the emigrants brought over, they expressed their willingness to take free grants of land, at a valuation of 1s 6d per acre, and they further promised to provide proper surveyors for the purpose of locating to every male not less than 200 acres of land from the quantity they were to receive. The object of the proposed settlement was stated in the following words:

'It is well known that the soil of Swan River, from its moist state, is better adapted to the cultivation of tobacco and cotton than any other part of Australia. Both of these articles are intended to be cultivated upon a large scale; as also sugar and flax, with various important articles of drugs for which the climate is peculiarly adapted to their growth.

The undersigned are satisfied, that should they succeed in sending home to the mother country that produce which at this moment the Government are indebted to powers which it would be their policy to suppress, were they in condition so to do, they will have forwarded not alone the views of His Majesty's Government, but effected a national good which neither time nor circumstances can erase from the annals of British history.

Their grazing operations will go very extensively into the rearing of horses for the East India Trade, with the most important establishment of large herds of cattle and swine, for the purpose of supplying His Majesty's or other shipping with salt provisions, as the proximity of salt mines, of the best description, holds out a great inducement towards its success.'

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<sup>(10)</sup> For despatch in full, see *Appendix* of the 1976 Year Book.

Owing to the delay which occurred in the Colonial Office in coming to a mutually satisfactory arrangement as regards the terms upon which the immense free grant of land asked for was to be made, three members of the syndicate withdrew from it, leaving only Mr Thomas Peel who, on 28 January 1829, again addressed the Colonial Office, stating that he was desirous of carrying on and completing the project by himself on the terms contained in a letter from the Colonial Office to the syndicate as originally composed, dated 6 December 1828, which read as follows:

'I am directed by Secretary Sir George Murray to acquaint you, in answer to your memorial dated the 14th of last month, that the terms upon which the free grants of land will be made in the proposed settlement of Western Australia are those contained in the paper, a copy of which I enclose. His Majesty's Government, however, are desirous that the experiment should not be made, in the first instance, upon a very large scale, on account of the extensive distress which would be occasioned by a failure in any of the objects expected from the undertakings; and they therefore consider it their duty to limit the grant which you request to a maximum of one million of acres. Half a million of these will be allotted to you as soon as possible after the arrival of the first vessel taken out by you, which may contain not less than four hundred persons of both sexes, in the proportions of not less than five female to six male settlers; and if you shall have covered this grant by investments, in accordance with the enclosed terms, before the expiration of the year 1840 the remaining half-million will be allotted to you by degrees, as fresh importations of settlers and capital shall be made, in accordance with the terms already mentioned. But in order that you may suffer no ultimate loss by any reasonable retardation of your investments, His Majesty's Government intend that the allowance of forty acres for every £3 invested shall not be reduced on your second half-million of acres, although your claim to such second half-million may not arise before the expiration of next year, which is the period limited to other settlers applying for free grants. But they will reserve your claim at the original rate of 1s 6d per acre until the expiration of the year 1840, after which time no part of your grant will be held binding upon which the whole required sum of 1s 6d per every acre shall not have been actually invested. A convenient allotment of land will be reserved for the town and harbour, for public buildings, and for the accommodation of future settlers; and a priority of choice to the extent of one hundred thousand acres will be allowed to Captain Stirling, whose surveys and reports of the coast have led to the formation of the settlement. The remaining land will be chosen by the settlers in the order of their arrival; those who arrive together drawing lots for the priority of choice.'

The enclosure was a copy of the old terms of settlement on the Swan River, worded as follows:

'Although it is the intention of His Majesty's Government to form a settlement on the western coast of Australia, the Government do not intend to incur any expense in conveying settlers, or in supplying them with necessaries after their arrival.

Such persons, however, as may be prepared to proceed to that country, at their own cost, before the end of the year 1829, in parties comprehending a proportion of not less than five female to six male settlers, will receive grants of land in fee simple (free of quit rent) proportioned to the capital which they may invest upon public or private objects in the Colony to the satisfaction of His Majesty's Government at home, certified by the Superintendent or officer administering the Colonial Government, at the rate of forty acres for every sum of

£3 so invested, provided they give previous security; first, that all supplies sent to the Colony, whether of provisions, stores, or other articles which may be purchased by the capitalists there, or which shall have been sent out for the use of them or their parties on the requisition of the Secretary of State, if not paid for on delivery in the Colony, shall be paid for at home, each capitalist being to be held liable in his proportion, and, secondly, that in the event of the establishment being broken up by the Governor or Superintendent, all persons desirous of returning to the British Islands shall be conveyed to their own home at the expense of the capitalists by whom they may have been taken out. The passages of labouring persons, whether paid for by themselves or others, and whether they be male or female, provided the proportion of the sexes before mentioned be preserved, will be considered as an investment of capital, entitling the party by whom any such payment may have been made to an allowance of land at the rate of £15, that is, of two hundred acres of land for the passage of every such labouring person over and above any other investment of capital.

Any land thus granted which shall not have been brought into cultivation or otherwise improved or reclaimed from its wild state, to the satisfaction of Government, within twenty-one years from the date of the grant, shall, at the end of the twenty-one years, revert absolutely to the Crown.

All these conditions with respect to free grants of land, and all contracts of labouring persons and others, who shall have bound themselves for a stipulated term of service, will be strictly maintained.

It is not intended that any convicts, or other description of prisoners, be sent to this new settlement.

The government will be administered by Captain Stirling, of the Royal Navy, as Civil Superintendent of the Settlement; and a Bill, in the nature of a civil charter, will be submitted to Parliament in the commencement of its next session.' (Dated 5 December 1828.)

It is worthy of note that, when shortly after new regulations were drawn up, only ten years were allowed under these for bringing land into cultivation.

Invested capital, according to the regulations, was to comprise:

1. Stock of every description;
2. All implements of husbandry and other articles applicable to the purposes of the productive industry, or necessary for the establishment of the settler on the land where he is to be located;
3. The amount of any half-pay or pension received from Government.

Under the word 'persons', it was distinctly understood no children under ten years of age were to be included.

Selection licences were granted to settlers on proof of value of property imported, but the fee simple could not be obtained until proof was given that the sum of 1s 6d per acre had been expended in the cultivation of the land or in other solid improvements.

All land granted was to be within three years cultivated or otherwise improved, or reclaimed from its wild state, to a fair proportion of at least one-fourth, or the owners would be liable to the payment of 6d per acre into the public chest; and should the land, at the end of a further seven years, still remain in an unimproved state, it was then to revert absolutely to the Crown.

After the year 1830 fresh conditions were to be made as to the disposal of land.



The tempting offer made by the Home Government of grants of land, large and small, in proportion to the amount of property introduced, attracted many holders of capital, the consequence being that extensive tracts of the best land were granted to purely speculative persons.

As regards Mr Thomas Peel, it remains to be stated that he failed to carry out the greater portion of his contract, the very first emigrants whom he brought out giving him endless trouble by desertion and otherwise, so that years passed in litigation and vain efforts at settlement. Finally he made a formal application to the Governor, on 25 September 1834, for a grant of land of 250,000 acres on conditions of general improvement. In compliance with this request he was granted, on 25 November following, the fee simple of the land subsequently known as Cockburn Sound Location No. 16, 'in consideration of certain location duties performed to the satisfaction of Governor Stirling'.

The first vessels to sail for the Swan River Settlement were H.M.S. 'Sulphur', having on board a detachment of the 63rd Regiment of Light Infantry, and the hired transport 'Parmelia', which carried the emigrants and the principal part of their belongings. Leaving England on 13 or 14 February, they arrived in the Colony on 8 June and 2 June 1829, respectively.

Closely following the 'Sulphur' and 'Parmelia' a number of vessels arrived, rapidly adding to the little band of settlers and introducing the livestock necessary for colonisation. [A list of these vessels with brief details of their cargoes and number of passengers carried was given in the *Appendix* of the 1975 Year Book — Ed.]

The following is a list of passengers who embarked on board the 'Parmelia'.

Names	Designations	Ages of children	Names	Designations	Ages of children
Capt. Stirling, R.N.	Lt Governor		Mr James Drummond	Agriculturist	
Mrs Ellen Stirling	his wife		Mrs Sarah Drummond	his wife	
Andrew Stirling	their son	3 years	Thomas Drummond	their son	18 years
Frederick H. Stirling	their son		Jane Drummond	daughter	16 years
(a)			James Drummond	son	15 years
William Stirling	his nephew		John Drummond	son	13 years
George Mangles	Stock Superin- tendent		Johnson Drummond	son	9 years
George Eliot		11 years	Euphemia Drummond	daughter	3 years
Thomas Blakey	servants to Lt Governor		Elizabeth Gamble	servant	
Sarah Blakey			Mr Charles Simmons	Surgeon	
John Kelly			Mr Tully Daly (b)	Asst Surgeon	
Elizabeth Kelly			Mrs Jane Daly	his wife	
Mr P. Brown	Col. Secretary		Jessie Jane Daly (b)	their daughter	8 years
Mrs Caroline Brown	his wife		Joseph T. Daly	son	6 years
MacBride Brown	their son	2 years	Henry John Daly	son	4 years
Ann Brown	daughter	6 months	Edward N. Daly	son	2 years
Richard Evans	servants to Brown		Eliza Rose Daly	daughter	2 months
Margaret McLeod			Jas. Elliott	servants to Daly	
Mary Ann Smith			Patrick Murphy		
Mr James Morgan	Storekeeper		Alex. Fandam	Cooper	
Mrs Rebecca Morgan	his wife		Mary Fandam	his wife	
Rebecca Morgan	their daughter	12 years	William Hoking	Artificer	
James Morgan	son	11 years	Mary Hoking	his wife	
Ann Shipsey			Jno. Hoking	their son	14 years
Commander M. J. Currie, R.N.	Harbour Master		Wm Hoking	son	12 years
			Mary Hoking	daughter	10 years
			Thos Hoking	son	8 years

Names	Designations	Ages of children	Names	Designations	Ages of children
Mrs Jane Currie	his wife		David Hoking	son	6 years
Frederick Ludlow	servants to Currie		Charles Hoking	son	2 years
Mildred Kitts Ludlow			Thos Davis	Smith	
Jane Fruin			Catherine Davis	his wife	
Mr John S. Roe	Surveyor		Jno. Davis	their son	3 years
Mrs Matilda Roe	his wife		Charlotte Davis	daughter	2 years
Charles D. Wright			John Davis	his nephew	13 years
Mr Henry C. Sutherland	Asst. Surveyor		James C. Smith	Boatbuilder	
Mrs Ann Sutherland	his wife		Sarah Smith	his wife	
Mr W. Shilton	Clerk to Col. Secretary		H. W. Reveley (c)	Civil Engineer	
			Amelia Reveley (c)	his wife	

(a) Born at sea. (b) Drowned in Table Bay (Cape of Good Hope), on 25 April 1829. (c) Embarked at Cape Town.

Reporting on the progress of the Colony, in a despatch dated 20 January 1830, Sir James Stirling mentions that two townsites had been laid out, one to be named Perth and the other Fremantle; and that the country extending between the sea and the mountains fifty miles southward from Perth had been thrown open for location.

As regards the composition of the population of the early settlement, he complains that, whilst 'amongst the heads of families there is a great majority of highly respectable and independent persons, there is in the working class a great variety', some having been carefully selected, but the greater part being the outcasts of parishes recommended to their employers by parish officers and possessing habits of the loosest description, the natural consequence being great inconvenience to their masters and endless trouble to the authorities. He had, therefore, been obliged to appoint a magistracy and a body of constables to maintain order, since which drunkenness and similar evils had been less frequent.

Another source of trouble was that many of the settlers were persons entirely unprepared for the hardships inseparable from initial colonisation, whose consequent disappointment and discouragement had created and spread a feeling of depression and general despondency amongst their fellows. From this depression the active and stout-hearted were gradually recovering and there was no reason to take a gloomy view of the future; but it would be necessary to contradict the reports of 'certain individuals who have seen only the sea beach, and have stated broadly that there is no good soil' to be found in the Colony.

The climate, it is said, was proving 'favourable to health in an uncommon degree'.

Amongst other items of interest, it is mentioned that a decent place of worship had been erected, owing principally to the energy of the Venerable Archdeacon Scott, a visitor to the Colony.

It was proposed to establish towns on the Murray River, on Cockburn Sound and on the Swan, at the site of the present town of Guildford.

Commenting on the stock and the prospects of the settlement in this direction, it is stated that 'the country as it is will certainly sustain a considerable number' of cattle, horses and sheep, 'as there is both food and water at the present season (January), the driest and worst of the year'. Attention is also drawn to the fact that the class of stock introduced was particularly good.

The rivers and coasts abounded in fish and offered facilities for fish-curing and the establishment of a whale fishery, as 'the coast is visited between the months of May and November by a multitude of whales'. The boat-building industry was being vigorously pursued

and already forty boats had been built for transport purposes on the river. A statement in the report, which reads curiously at the present time, is that workmen had not been able to work between the hours of 10 a.m. and 3 p.m. during the months of December and January, on account of the heat.

The following interesting statistical information is added.

Since 1 June 1829, twenty-five ships had arrived and there were then 850 persons resident and 440 non-residents in the settlement. The value of the capital etc. introduced, for which land was claimed, amounted to £41,550; land had already been allotted to the extent of 525,000 acres, the locations actually effected numbering thirty-nine; and, finally, there were in the settlement horned cattle to the number of 204, horses 57, sheep 1,096 and hogs 106.

In a further despatch of 18 October 1830, it is stated that 'the progress of the settlement, although not unopposed by many adverse circumstances, had been as rapid as could have been expected or desired', as 'a greater increase would have probably been disadvantageous to the welfare of the settlement whilst struggling in its infancy'. Unfortunately, 'although no doubt existed as to the salubrity of the climate and country, much sickness had been experienced and deaths in consequence had been very numerous'. These, however, are attributed to 'circumstances of a temporary nature attendant on the commencement of a colony'.

Exploration of the country and coast had been carried on as far as means available had admitted.

The natives in general had been harmless, except in two cases, one being in Perth, where, in May 1830, an affray occurred which led to the military being called out; whilst in the Murray district they had been so repeatedly troublesome — in one instance a young man having been murdered at the entrance of the Murray River — that a military guard had to be placed there.

Up to 31 December 1830, there had arrived in the Colony as nearly as can be reckoned, without counting the detachment of troops and their families in the 'Sulphur', 'Norfolk' and 'James Paterson', about 1,767 persons, with stock as follows: horses 101, cattle 583, sheep 7,981, pigs 66, goats 36 and a variety of poultry, including turkeys, ducks, geese, fowls and pigeons, and also a few dogs.

The value of the property introduced upon which land was claimed between 1 September 1829 and 30 June 1830, amounted to £73,260 8s 3½d, equal, at 1s 6d per acre, to 976,805 acres of freehold land, whilst miscellaneous property inapplicable to the improvement of land had been imported to the value of £21,021 2s 7d, making a total value of £94,281 10s 10½d.

To show how rapidly and prodigally all the best land was taken up, a late arrival wrote, on 12 November 1830, just five months after the first settlement of the Colony: 'The only land available for present purposes is on and near the banks of the rivers (*viz.*, the Swan and Canning). All this is now allotted on both sides of each river, almost to their source'; and, writing again on 8 December in the same year, he said 'All the lands up the Swan and Canning have been long since granted, but some of the grantees have left the Colony, and their land may be resumed by the Government if not occupied at the expiration of the year.'

There being no made roads, and the bush tracks consisting solely of dry, heavy sand, water carriage was the one means of transport for produce and the only way to obtain land, in an accessible position, suitable for farming purposes, was for the recent arrival to take over a portion of a block already granted, guaranteeing to the owner to perform sufficient location duties on the part taken to secure the whole grant, when the remainder of the property in all probability was left permanently unimproved.

Many of the early arrivals were persons totally unqualified for a settler's life, especially as the pioneers of a new settlement.

Arriving also as they did during the most inclement season of the year, exposed to the elements and utterly unaccustomed to encounter the hardships and privations incident to their

new life, in most cases totally ignorant of agriculture and unused to poverty and isolation, there is little wonder that the first reports which reached their friends in England were of a gloomy and discouraging description.

Numerous persons, indeed, left the Colony in disgust, but retained possession of the immense tracts of land granted to them; so that those who arrived afterwards were unable to obtain land in favourable localities and the population was in this way thinly scattered over a wide area, the best of the land being unprofitably locked up.

Gradually, also, it was discovered that the expectations entertained as to the fertility of the soil had been far too sanguine; food became scarce and pastoral and agricultural operations languished from want of capital to stock and till the lands. Sheep and cattle went blind or dropped dead in a mysterious way, from eating a (at that time unknown) poison plant and at last it became apparent that the infant settlement could only with great difficulty support itself independently of extraneous aid. On the top of all this came serious troubles with the natives — life was threatened, houses were robbed, crops rooted up and stock speared; and the abandonment of the Colony was at one time seriously contemplated.

But the settlers as a body struggled manfully on, maintaining (to quote Governor Stirling's despatch to Sir George Murray, G.C.B., the then Secretary of State for the Colonies), 'a cheerful confidence in the qualities of the country and a general belief in its future prosperity'.

A few years later, in a despatch of 29 August 1836, a suggestion is made that experiments on a limited scale should be encouraged in the northern parts of the Colony in the production of cotton and sugar, through the instrumentality of Bengalese or Chinese labour, the success of which, it is stated, would mean that 'Great Britain might render herself in a short time independent of the United States and other foreign slave-holding countries for her supply of cotton, the regular importation of which, at low prices, has become indispensably necessary to the daily support of a large portion of her population'.

With such an abundant extent of country applicable and available for the production of sugar, cotton and other inter-tropical products and possessing from its geographical position the advantage of being readily able to secure the class and mass of labour required, it is argued that, given only the transport facilities for obtaining the necessary supplies and labour, with the aid of skill, capital and the benefit of British protection, the sugar or cotton grower, if once successfully established, might defy competition even with those countries which still employed slave labour and, possibly, by thus rendering slavery unprofitable, eventually assist towards its extinction.

The condition of the Colony about that time is graphically described (Despatch No. 218 of 15 October 1837) in a statistical report forwarded to the Colonial Office, which contained full particulars concerning its geography and other natural characteristics, a brief census of its population and much other useful and interesting information.

The discovery of copper ore by Captain King in the vicinity of Camden Bay is mentioned as being not unlikely to lead to other important mineralogical discoveries.

Governor Stirling's opinion of the capabilities of the soil, based upon personal observation and experience, is neither over-sanguine nor yet wholly unfavourable and is perhaps best given in his own words:

'The surface of the country generally is covered with those substances which are technically called earths, in contradistinction to soils. Of the latter, as far at least as relates to those of a vegetable origin, a very small portion exists, and that only on moist grounds. The extreme drought of the climate and the summer conflagrations appear to prevent the growth of succulent plants, as well as any great accumulation of soil from decayed vegetation. But although the country is not remarkable for richness of soil, it is favourable in other respects to farming purposes. In its natural state there is scarcely any part which does not produce

some description of plant, and its defects appear to be of that class which art, aided by climate, will be enabled hereafter to overcome. . . . Upon a general view of that portion of the territory which has fallen within my own knowledge, I am under the necessity of saying that a very large portion of its surface, extending probably to three-fifths of the whole, is poor and comparatively unprofitable, and unlikely to be cultivated, or to yield any return except in timber, until a dense population and low wages, aided by abundance of cattle, bring it into use.

The best districts at present known are those on the Avon, the Hotham, the Williams, Arthur, Beaufort, and South-East River, together with portions of country adjacent to the Swan, the Murray, the Harvey, Brunswick, Preston, Capel, and Vasse.

It is to be remembered, however, that these remarks apply only to the very small part of this vast country which has been as yet explored, and that in the progress of settlement circumstances are continually arising to give value to lands, which, while wages are high and roads wanting, are not of the slightest value.'

He again calls attention to the possibilities of the northern parts of the Colony for sugar and cotton growing, but points out that 'Experiments in these branches of industry are, however, beyond the means of the numbers of the colonists at present', adding that he ventured to anticipate 'that the estimation of the Colony in the eyes of the public will be gradually enhanced the longer this peculiarity in its natural qualifications is considered and examined.'

The following are some of the more important particulars which are further contained in the report:

The number of town allotments granted in Perth to 30 June 1837 was 422; that of suburban allotments, 15; miles of fencing completed, 35, valued at £5,600; the number of houses built, about 350, valued at £30,000; the value of suburban improvements was estimated at £4,000, that of gardens at £2,000, of mills at £3,000 and of public works at £15,000. A similar valuation of Fremantle public and private property amounted to a total of £28,000. The aggregate of the corresponding amounts for Guildford, Albany, Augusta, Kelmscott, York, Peel Town, Busselton and Kings Town, together with Perth and Fremantle, was about £93,000. The population of Perth numbered 590, that of Fremantle 387, of Swan River District 524, of Canning River District 41, York 65, Plantagenet 170, Murray 17, Augusta 32 and Vasse 21; in addition to these there were the military who, with their womenfolk and children, numbered 185; the total population therefore numbered 2,032. Of the non-military population, 506 were married and 1,341 single. The total of 2,032 comprised 914 males over fourteen years of age, 368 males under fourteen years, 430 females over fourteen and 320 females under fourteen. The total population in 1832 had been 1,510 and the increase was mostly due to the excess of births over deaths. The deaths during the preceding twelve months had been at the rate of 1 in 200. Of the adult male population no less than 449 were engaged in agricultural pursuits. At the end of 1836 there had been about 1,380 acres under wheat, the total land in crop being about 2,100 acres. Sheep numbered 8,528, horned cattle 829, horses 216, pigs 819, and goats 1,286. The wheat produced during the year amounted to 22,104 bushels. The estimated value of improvements on rural grants was £75,000. The total number of acres granted to 30 June 1837 was 1,524,004. The exports during the year amounted to £6,720, of which £2,400 represented wool and £3,200 oil, mostly probably the product of the whale fishery. The total wealth of the Colony was estimated at £360,000, producing, with the labour of the community, after deducting its subsistence, a clear annual accumulation of capital to the extent of £72,000. The revenue of the Colony for the year was £4,586. As regards labour, the wages for general labourers were about 5s per day, but artificers earned from 8s to 10s. Labour was still scarce and, although the Colony was self-supporting and money seemed to be abundant, the apparent wheat-growing, wine-growing, and

fruit-growing capabilities of the soil could not as yet be taken advantage of to any great extent, on account of the difficulty experienced in obtaining suitable workmen. That money was abundant was proved by the fact that a joint-stock bank which had been recently established, discounting bills at 12½ per cent per annum and allowing depositors an interest of 5 per cent, was principally working with deposits to the value of £4,000 and had so far only had occasion to call up £1,250 of its nominal capital of £10,000. The public expenditure for the year ended March 1837 had been £10,753, whilst the payments in connection with the troops, provisions, etc. amounted to £11,022. It was foreseen that considerable expenditure would be necessary in the near future, there being as yet practically no made roads. Perth and Fremantle town lots were then sold at the rate of £5 per acre. In 1832 the sale of rural Crown land had come into operation and in 1834 this had been made applicable to town allotments. During the first three years of the settlement, property in livestock, implements, provisions, apparel, furniture, etc. had been imported to the value of about £120,000. Since then, it was estimated, such importation had been increased by about £100,000, whilst the probable value of re-exported property was £20,000. The total outlay of the Crown to 31 March 1837, on behalf of the Swan River Settlement, had been £145,167. It was adduced as proof of a fairly satisfactory moral condition of the population that, during the eight years of the Colony's existence, not a single sentence of death had been required to be passed. As a further indication of progress it was mentioned that, in addition to the *Government Gazette*, two newspapers were in existence — one, the *Perth Gazette*, having already existed some years, whilst the other, the *Swan River Guardian*, had been established in 1836, 'as the friend of the people and the corrector of abuses'.

For a time the Colony continued to progress steadily, if slowly. Its development was once more, however, retarded by the discovery of the rich goldfields of Victoria, and again it seemed probable that it would be entirely deserted. Happily, however, for the Swan River Settlement, the goldfields of the eastern Colonies subsequently ceased to possess the extraordinary fascination they formerly did and Western Australia, at the turn of the century, with extensive goldfields of her own, her vast area of agricultural and pastoral lands, her timber, and numerous other undeveloped resources, offered an attractive prospect for the capitalist or the industrious and thrifty immigrant.

# CHAPTER II — PHYSICAL FEATURES, CLIMATE, FLORA AND FAUNA

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## CHAPTER II — PHYSICAL FEATURES, CLIMATE, FLORA AND FAUNA

### Area and Coastline of Australia

The area of the States and Territories and the length of the coastline of Australia were determined in 1973 by the Division of National Mapping of the Department of National Resources by manually digitising these features from the 1:250,000 map series of Australia. Consequently, only features of measurable size at this scale were considered. About 60,000 points were digitised at an approximate spacing of 0.5 kilometres and these points were joined by chords as the basis for calculation of areas and coastline lengths by computer.

The approximate high water mark coastline was digitised and included all bays, ports and estuaries which are open to the sea. In these cases, the shoreline was assumed to be where the seaward boundary of the title of ownership would be. Rivers were considered along similar lines but the decisions were rather more subjective, the digitised line being across the river where it appeared to take its true form. In mangroves, the shoreline was assumed to be on the landward side.

Areas and lengths of coastline determined by the foregoing methods are given in the following table. The Division of National Mapping is also progressively revising areas of local government authorities but has not yet completed this work. For this reason, areas given for statistical divisions do not add to the total area shown for the State.

State or Territory	Present area	Percentage of total area	Length of coastline (a)
	sq km		kilometres
New South Wales	801,600	10.43	1,900
Victoria	227,600	2.96	1,800
Queensland	1,727,200	22.48	7,400
South Australia	984,000	12.81	3,700
Western Australia	2,525,500	32.87	12,500
Tasmania	67,800	0.88	3,200
Northern Territory	1,346,200	17.52	6,200
Australian Capital Territory	2,400	0.03	(b)
<b>AUSTRALIA</b>	<b>7,682,300</b>	<b>100.00</b>	<b>36,800</b>

(a) These measurements are broadly on a 'direct' basis but, even so, they must be regarded as approximate only. (b) Australian Capital Territory. Jervis Bay area included in New South Wales.

### Part 1 — Physical Features and Geology

*Contributed by*

*Rex T. Prider, B.Sc., Ph.D., F.G.S., M.Aust.I.M.M.*

*(Emeritus Professor of Geology, University of Western Australia)*

The development of any country depends on its natural resources and the industry of its people, and there can be few more important investigations for any country than those dealing with the productive capacity of its territory. Natural resources — be they power, mineral, or soil resources — are dependent entirely on the climate, physical features and geology. Looking at



the pattern of development of Western Australia we see that for nearly seventy years after the foundation of the Swan River Colony in 1829 agricultural production barely kept pace with the requirements of the small population. The gold discoveries in the 1890s, however, led to a period of rapid expansion and Western Australia became one of the major gold-producing areas of the world, and with this increase in mining production there was a corresponding expansion of the agricultural and pastoral industries. We are now experiencing an expansion of our secondary industries. Today, with the realisation of the base metal mineral potential of Western Australia — the proven deposits of iron ore, nickel, bauxite, black sands, oil and natural gas and the high probability of further discoveries — we are in another period of unprecedented development. Mineral discoveries of the past decade in Western Australia stimulated the mining industry not only in Western Australia but throughout the whole of Australia. The Western Australian mineral discoveries of the late 1960s were accompanied by a corresponding increase in our secondary industries and the opening up of formerly sparsely populated areas, particularly in the Pilbara. Western Australia has, to date, been deficient in power resources, but this deficiency will be remedied by the development of large natural gas reserves discovered near the southern margin of the North-West Shelf. In each of these phases of development we can see the dominating influence of the geological environment so that geology, from being relatively unknown and the Cinderella of the sciences, has now become known to all.

The nature of the rocks underlying any region is one of the major factors controlling topography, soil, and mineral resources. The latter is self-evident. The soil, on which we are so dependent, was formed by the weathering of the underlying rocks and many of its characters are due to the parent rock material. Much research has been carried out into trace element deficiencies in soils and the application of the new knowledge has produced astounding results as far as land utilisation is concerned. At first it would seem fantastic to think of the underlying rocks being in any way responsible for malnutrition of stock, but when it is demonstrated that the malnutrition is due to the lack of some minor element in the fodder which is due to its deficiency in the soil, a deficiency which, in its turn, is due to the absence or relative absence of such elements from the parent rocks from which the soil was derived, the significance of the geological environment becomes evident. Topography which is important in connection with land utilisation, water conservation, power (hydro-electric) resources, and in affecting climate, soil erosion, coastal erosion, transport routes, harbours, and so on is also dependent to a great extent on the nature and structure of the underlying rocks.

It is appropriate therefore that we should consider here the physical features and geology of Western Australia since they, together with the climate, are the primary controls of our soil, mineral, water and power resources, on which our existence and future development are entirely dependent.

### PHYSICAL FEATURES

In the broadest way this State can be divided into two physical regions: (i) a tableland (the *Great Plateau*) in various stages of dissection occupying the whole of the interior of the State; (ii) a low-lying narrow strip (the *Coastal Plains*) running almost continuously along the coast from near Albany to Broome. A third physical region, the *Scarplands*, separating the Coastal Plains from the Great Plateau, may be distinguished. This, although only a narrow belt, is a significant one in the southern part of the State because of its importance in connection with the water conservation schemes on which the metropolitan area, the mining fields in the vicinity of Kalgoorlie, the intervening agricultural and pastoral districts, the irrigation areas on the coastal plains south of Perth, and more recently the wheat belt along the Great Southern Railway, are dependent.

#### The Great Plateau

The Great Plateau which occupies more than 90 per cent of the area of the State varies considerably in elevation. In its highest parts (in the north-west) it attains a height of

approximately 1,200 metres above sea-level. The greater part is, however, below the 600-metre contour and its average elevation is of the order of 300 to 450 metres above sea-level. Although there is this considerable variation in level the changes are so gradual that the plateau character of the country is not obscured and for the most part it may be regarded as having a vast, gently undulating surface. Occasional hills (monadnocks, which are remnants of a previous cycle of erosion) rise above the general surface of the plateau.

The Great Plateau may be conveniently subdivided into an area of exterior drainage (where there are definite rivers which flow to the sea), an area of interior drainage (where such water as flows passes into inland basins), and two areas of no surface drainage but which, if they had drainage, would belong to the exterior drainage system. The area of exterior drainage can be marked out by connecting the source of the streams which flow to the sea and if this is done it will be seen that the width of the exterior drainage belt varies considerably. Thus in the Kimberley and North-West Divisions some of the rivers are hundreds of kilometres long, but in the south-west part of the State many of them are comparatively short. The areas of no surface drainage are in the north of the North-West Division along the Eighty Mile Beach from the mouth of the De Grey River to the north of Broome, and on the Nullarbor Plain in the south-eastern corner of the State. The remainder of the country forms the interior drainage area.

In the area of exterior drainage the dominant feature of the extreme south-west and the northern part of the plateau is a reticulate pattern of rather deeply-incised watercourses. In the southern part of the State these deeply-incised watercourses where they pass from the plateau to the coastal plains are of great significance (as has already been mentioned) in connection with water supply schemes. Elsewhere in the State the marginal portion of the Plateau is drained by rivers that flow to the sea only at times of exceptional rainfall and, speaking in the most general way, have courses at right angles to the coast.

The area of interior drainage is arid and practically riverless. Small creeks run from the higher parts of the country but they either disappear on the extensive flats or reach the shallow basins which are termed salt or 'dry' lakes, the term 'dry' being used since these so-called lakes are free from water except after fairly heavy or long-continued rain. These 'lakes' are generally elongated, narrow, and often winding salt-encrusted flats arranged in long, more or less connected streams. After heavy rain they are covered with a thin layer of water and, after unusually heavy rain, water has been known to flow southwards from one to another of the 'lakes' of a string, except towards the western margin of the plateau where the drainage is to the west. It is evident that these elongated 'lakes' are the remnants of an old river system developed during a more humid period. The salt lakes are of some economic significance since, on the evaporation of the water, common salt and other substances such as gypsum are deposited on the floor of the lake. The gypsum, which crystallises earlier than the common salt, is generally blown from the damp surface of the dried-up lake and deposited as dunes of 'seed gypsum' on the leeward (eastern) side of the lake. These dunes are utilised, for example at Lake Seabrook north of Yellowdine, as a source of gypsum for plasters. Common salt, which separates later, forms a crust on the floor of the lake when it has been completely dried up and such salt deposits are exploited, for example at Lake Lefroy near Widgiemooltha. In a few of the Western Australian salt lakes, such as Lake Champion, significant deposits of alunitic clay (a potential source of potash) have been discovered. More important potash deposits occur in some coastal lakes, such as Lake MacLeod, north of Carnarvon.

Over a large portion of the interior drainage part of the Great Plateau there are extensive sand-plain soils overlying a hard laterite ('ironstone') layer, which is of the order of up to four and a half metres in thickness, below which lies an intensely weathered zone from which most of the nutrient elements so important for plant growth have been leached. These more recent geological formations will be discussed in the section of this Part dealing with geology, but we may note here the significance of this lateritic profile (sandy soils near the surface, 'ironstone' about a metre below, and completely kaolinised rocks still deeper) so far as soil fertility is

concerned. This lateritic profile is the result of long-continued weathering processes which have resulted in almost complete leaching of the valuable nutrients and as a result soils developed in any part of this profile are generally very poor in character. It is only where erosion has cut through the lateritic profile and still younger soils have been formed by weathering of the underlying rocks that the better soils are found. Recent studies of trace element deficiencies indicate, however, that much can be done with these 'light' soils by the addition of small quantities of suitable trace elements such as copper and molybdenum.

The areas of no surface drainage include the Eucla Division and portions of the Eastern Division of the State. This area is occupied largely by flat-bedded, nearly horizontal limestones of the Nullarbor Plain and the drainage here is sub-surface in character by subterranean streams through caverns in the limestone. The Nullarbor Plain is an extensive monotonously level plain standing about 180 metres above sea-level. The Western Australian part of the Nullarbor Plain is bordered to the south by a narrow coastal plain but further east, at the head of the Great Australian Bight, in South Australia, this coastal plain is absent and the southern edge of the Plain is truncated by cliffs which rise almost sheer for sixty to 120 metres above sea-level.

The hills of the Great Plateau are of two kinds, ridged and table-topped. In the southern half of the State the ridged hills, a few of which rise as much as 450 metres above their surroundings, are generally elongated in a NNW direction, reflecting in their trend the structure of the underlying rocks. The table-topped hills are seldom more than sixty metres above the general level. They are capped with a sub-horizontal layer of laterite ('ironstone') and bounded by low cliffs, in many places undercut, which are known in Western Australia as 'breakaways'. The table-topped hills are relics of erosion of a former laterite-covered peneplain (the *Darling Peneplain*) which was uplifted in Pliocene times to form the Darling Plateau and has subsequently been subjected to erosion under semi-arid conditions. The ridged hills on the other hand are elongated monadnocks which, being cored by resistant rocks such as jasper bars, withstood erosion and so rise above the general level of the remnants of the laterite-covered Darling Plateau.

The Great Plateau slopes down very gradually to the south and west. The downward slope to the south is interrupted by a narrow broken chain of rugged hills, the Stirling and Mount Barren Ranges which rise to heights of from 300 to 1,100 metres above sea-level. The western margin of the Plateau is, in the south, formed by the 'Darling Range' which, being merely the dissected margin of the Plateau, is much better called the *Darling Scarp*. This Darling Scarp is clearly defined between latitudes 31° 30' S and 33° 30' S, *i.e.* between Moora and Donnybrook, but it is difficult to recognise farther north or south. In the Kimberley Division the mountain ranges are the relics of erosion between the deeply-incised rivers and in this region the highlands of the Plateau terminate abruptly along a steep, deeply-indented coastline.

### **The Coastal Plains**

Bordering the Great Plateau are the Coastal Plains which vary in width. The *Swan Coastal Plain* which extends from the neighbourhood of Perth to near Busselton averages about twenty-four kilometres in width and is divisible into the following belts: a narrow band of moving sand dunes along the coast; a zone, averaging five or six kilometres wide, of sandy limestone which rises in places to heights of thirty to sixty metres above sea-level; a zone five or six kilometres wide of loose sand fixed by vegetation; and, abutting against the Scarp which forms the western margin of the Plateau, a zone of clayey soils of about the same width. A strip of low plain extends along the coast at intervals as far north as King Sound and coastal plains of some width occur near Port Hedland and Exmouth Gulf. A narrow plain fronts the cliffs of the Great Australian Bight for some distance and also occurs in other places along the south coast.

The coastline of Western Australia, some 12,500 kilometres in length, is broken by capes between Wyndham and Broome, between Port Hedland and Shark Bay, and between Cape Naturaliste and Israelite Bay. The intervening parts are comparatively featureless.

It has only been possible here to briefly outline the principal physical features of Western Australia and for a fuller description of the physiography of this State the reader should consult J. T. Jutson's 'Physiography (Geomorphology) of Western Australia' (*Geol. Surv. West. Aust. Bull.* 95).

## GEOLOGY

About two-thirds of Western Australia is occupied by the ancient Australian Precambrian Shield which is composed of a complex of igneous, metamorphic and sedimentary rocks formed more than 600 million years ago. Most of our mineral deposits of economic importance, except coal, oil, natural gas and water and superficial deposits such as lateritic iron ore and bauxite deposits and black sand and other alluvial accumulations, occur in these Precambrian rocks. The remainder of the State is occupied by sedimentary basins in which Palaeozoic and later sediments are developed. It is in these younger sedimentary basins that artesian water, coal, oil and natural gas are likely to occur. Finally there are still younger superficial deposits—laterites, salt-lake deposits, shallow groundwater, and soils on which much of the economy of this country depends. It will be convenient therefore, in outlining the geology of the State, to consider it under the three main headings:

- (a) The Precambrian basement;
- (b) The sedimentary basins;
- (c) The superficial deposits;

The distribution of the solid rocks (omitting superficial deposits) is shown in the accompanying map.

### The Precambrian Basement

This includes the Archaean and Proterozoic rocks. The Archaean is a complex of crystalline igneous and metamorphic rocks, dominantly granites and gneisses with minor amounts of schistose metamorphosed acid and basic volcanics and sedimentary formations. In places, particularly in the North-West and Kimberley Divisions, this Archaean complex is overlain unconformably by sedimentary and volcanic rocks of Proterozoic age which generally do not exhibit the extensive metamorphism so characteristic of the older Archaean complex. The time-boundary between the younger Precambrian (Proterozoic) and older Precambrian (Archaean) is approximately 2,200 million years ago. Within the different areas occupied by the Precambrian rocks the same generalised sequence can be distinguished.

In the Kimberley the oldest rocks are metamorphosed igneous and sedimentary rocks intruded by granite and carrying in places auriferous and base metal ore deposits, and these are overlain by un-metamorphosed sediments with basic igneous intrusives. The Precambrian age of all these rocks is evidenced by the fact that in the east Kimberley they are overlain by sedimentary rocks containing fossils of Cambrian age. This is the only area in Western Australia where the Precambrian age of the rocks of this crystalline complex can definitely be proved on stratigraphical evidence alone. In the southern part of the State we find a similar sequence of crystalline schists with intrusive granites and by lithological correlation (which is not a very sound method) we assume that they are Precambrian although they cannot actually be traced through from the Kimberley. We do know that in the Carnarvon Basin these gneisses, schists and granites are older than the Devonian, which unconformably overlies them, and in the Perth Basin they are older than the Permian. During recent years the Precambrian age of these rocks has been confirmed by actual age determinations based on the decay of radioactive elements which occur in them. This work indicates that the bulk of the massive granitic intrusions of the southern part of the State and in the Pilbara crystallised from a molten state some 2,700 million years ago. Some, however, such as those in the vicinity of Albany and along the south coast, are much younger, being emplaced approximately 1,100 million years ago.

The Precambrian sequence in the North-West appears to be the most complete that is present in Western Australia. This region consists of the Pilbara Block to the north and the



Median Belt to the south, separating the Pilbara Block from the Yilgarn Block. The Pilbara Block consists mainly of Archaean igneous and metamorphic rocks with small areas of unconformably overlying Proterozoic sedimentary rocks. The Median Belt on the other hand is made up mainly of Proterozoic sedimentary rocks, with a few comparatively small inliers ('islands') of Archaean rocks. This Median Belt consists, structurally, of two large Lower Proterozoic sedimentary basins: the Hamersley Basin overlapping the Pilbara Block to the north and the Nabberu Basin overlapping the Yilgarn Block to the south. The central part of this Median Belt is occupied by Middle to Upper Proterozoic sediments, which overlie the Lower Proterozoic sedimentary rocks of the Hamersley Basin to the north and the Nabberu Basin to the south.

The Precambrian sequence in the Pilbara Block and Median Belt, from oldest to youngest, is as follows.

The *Warrawoona Group*, which consists mainly of greenstones and green schists which, prior to intense folding and metamorphism after their deposition, were submarine basaltic lavas and tuffs, with thin interbedded chemically deposited sedimentary rocks (chert, jaspilite and banded iron formations). Conformably overlying the basaltic volcanics is a sedimentary succession (the *Gorge Creek Group*) of banded iron formation and clastic sediments (sandstone, shale and conglomerate). The banded iron formation of this group is the parent material of important iron ore deposits such as those of Mount Goldsworthy. Clastic sedimentary rocks unconformably overlying the Warrawoona volcanics in the eastern Pilbara form the *Mosquito Creek Beds*. These are thought to probably correlate with the Gorge Creek Group further west. The sedimentary assemblage of the Gorge Creek Group is unconformably overlain by acid volcanics (part of the *Whim Creek Group*) which, at Whim Creek, are the host rocks of the copper-lead-zinc deposits. All of these rocks have been intruded by granitic igneous rocks, the older gneissic granitic rocks being formed about 3,100 million years ago, and the younger massive granites approximately 2,700 million years ago. The older volcanic and sedimentary successions carry auriferous ore-bodies, possibly genetically related to the younger intrusive granites. End-stage products of these younger granites are the very coarse-grained pegmatites which are important carriers of tantalum (in tantalite), beryllium (in beryl), lithium (in spodumene and lepidolite), and tin (in cassiterite). All of these rocks in the North-West — the Warrawoona and Mosquito Creek Successions and the granites intrusive into them — are therefore of Archaean age and have been called the *Pilbara System*. These Archaean rocks have been intruded by north-south trending basic dykes emplaced approximately 2,300 million years ago. These dykes do not penetrate the overlying Lower Proterozoic sediments, but may be feeders of some of the basic volcanics of the lower part of the Lower Proterozoic sequence. Still younger sedimentary rocks such as conglomerates, sandstones, shales and banded iron formations with interbedded basic igneous rocks, were deposited unconformably on the highly-folded, granite-intruded Pilbara System. This thick succession consists of a number of distinct groups. The three lower groups (the *Fortescue*, *Hamersley* and *Wyloo Groups*) are of Lower Proterozoic age as the youngest (the Wyloo Group) is intruded by granite aged approximately 1,700 million years. The two upper groups (the *Breshnahan* and *Bangemall Groups*) are of Middle and Upper Proterozoic age, respectively. Of these Proterozoic rocks the Hamersley Group is most important economically since most of the iron-ore deposits of the Hamersley and Ophthalmia Ranges such as those of Mount Tom Price, Mount Newman and Paraburdoo occur within, or have been derived from, the thick jaspilites (banded iron formations) within this group. Except in occasional narrow belts marginal to the Archaean blocks, the Proterozoic rocks have not suffered the intense folding that affected the older rocks and consequently they are generally flat-dipping to horizontally bedded un-metamorphosed sediments. Such sediments cover very extensive areas in the North-West (see Geological Map of Western Australia on previous page) and they are similar in many respects to the flat-dipping Proterozoic sediments which cover the plateau country of the north Kimberley.

Coming to the southern half of the State we find a similar sequence to that in the North-West. In the part of the Precambrian Shield extending south of latitude 26° S (the Yilgarn Block) the oldest rocks that are recognised are the greenstones of the various gold-mining fields which occur in comparatively narrow belts elongated in a general NNW direction (see following map). These greenstones, which are for the most part metamorphosed basaltic lavas, contain interbedded ultrabasic lavas and jaspilites and are overlain by metamorphosed sedimentary rocks which contain accessory zircon (with radiogenic ages approximating 3,300 million years) derived from pre-existing rocks. About 3,000 million years ago, the greenstones and metasedimentary rocks were intensely compressed into tightly closed folds with NNW-trending axes. During this period of intense earth-movement, granitic magma concordantly intruded these older rocks or alkaline solutions permeated them, converting them into granitic gneisses which occupy most of the southern half of Western Australia. This System of rocks has been called the *Kalgoorlie-Yilgarn System*. From the mining point of view, the greenstone and metasedimentary parts of this System are most important since the auriferous ore deposits of the main mining fields are confined to it, as are the known nickel deposits. It also contains, in the jaspilites, important iron-ore deposits such as those of Koolyanobbing in the Yilgarn. Subsequently, at about 2,700 million years ago, granite magma was again intruded as in the North-West, so the Kalgoorlie-Yilgarn System in the southern half (the Yilgarn Block) of the State appears to be the equivalent of the Pilbara System of the Pilbara Block. This completes the Archaean sequence. The Proterozoic is represented by a narrow strip of slightly altered, steeply-dipping sedimentary rocks along the Darling Scarp and flat-dipping sediments on top of the older crystalline rocks of the western part of the Yilgarn Block as at Watheroo, Yandanooka and the Billeranga Hills near Morawa. Proterozoic igneous activity is represented by Early Proterozoic layered complexes and Late Proterozoic basic dykes. The former (probably comparable to the north-south suite of the Pilbara Block), aged 2,420 million years, take the form of basic-ultrabasic layered complexes, such as the large east-west dykes of the Norseman-Laverton greenstone belt which have some prospects for the occurrence of nickel and chrome deposits. The latter are dolerite dykes which intruded all of the Precambrian rocks about 550 million years ago. They occur throughout the Precambrian Shield but are most abundant near its western margin where some are quarried and crushed for road metal.

The strip of country south of, and including, the Stirling Range, and extending in an east-north-easterly direction to the Fraser Range (east of Norseman) and thence in a north-easterly direction into Central Australia, differs from the previously described Yilgarn Block. In it the regional trend is east-west compared with the north-north-westerly trend of the Yilgarn Block. It consists of a belt of crystalline schists and gneisses (exposed along the south coast) intruded by granite (as at Albany and Esperance). These crystalline rocks are very similar to the granitic gneisses of the Yilgarn Block, but the massive granites were intruded much later — approximately 1,100 million years ago, compared with the 2,700 million years age of the late-Archaean granite intrusives of the Yilgarn Block. These crystalline rocks are overlain unconformably by still younger low-grade metasedimentary phyllites and quartzites (originally mudstones and sandstones) comprising the *Stirling Range Beds*. Both the granite-intruded basement and the *Stirling Range Beds* are intruded by dolerite dykes, similar to those of the Yilgarn Block. Although the granites of this South Coast Province are much younger than those of the Yilgarn Block, it is thought that the *Stirling Range Beds* and the intrusive dolerite dykes are comparable with the Proterozoic sediments and dolerites of the Yilgarn Block.

There is a comparatively narrow strip of crystalline metamorphic rocks along the western margin of the Perth Basin and wrapping around the northern margin of the Yilgarn Block. The southern part extending from Cape Leeuwin to Cape Naturaliste is a belt about twenty kilometres wide of isoclinally folded gneisses, with a regional NW trend, which have a radiogenic age of 650 million years, while the part extending northerly from Geraldton through the Northampton Mineral Field consists of NW-striking metasedimentary granulites and gneisses

containing segregation pegmatites aged about 1,000 million years and intruded by basic dykes comparable to the Late Proterozoic dykes of the main part of the Shield. Recent work by the Geological Survey of Western Australia indicates that metamorphic rocks along the northern margin of the Yilgarn Block are most probably metamorphosed Bangemall (*i.e.* Upper Proterozoic) sediments. It is evident, therefore, that the main Yilgarn Archaean Block is almost completely ringed with metamorphosed Proterozoic rocks.

Putting together the information available throughout the State, we conclude that the oldest rocks found in Western Australia belong to the older part of the Archaean Era. It is a great succession of rocks, generally much metamorphosed, which is called the Kalgoorlie-Yilgarn System in the southern part of the State and the Pilbara System in the north-west region. In the early part of Kalgoorlie-Yilgarn (Pilbara) times there was much volcanic activity which took the form of eruptions of ultrabasic, basic and intermediate lavas, tuffs, and breccias. Many of the basic lavas, as judged from the pillow structures they contain, were submarine extrusions. These volcanic rocks were penetrated, shortly after their extrusion, by intrusions from the same magma. Similar events must be occurring now in the interior of great volcanic masses like Etna or Hawaii. In later Kalgoorlie-Yilgarn times, the dominant process was sedimentation, so that the earlier volcanic rocks, with the minor associated bands of sediment, became overlain by a great thickness of sandy and clayey sediments. These sediments must have been derived from some land mass composed of rocks of pre-Kalgoorlie-Yilgarn (pre-Pilbara) age but this, possibly the oldest of all rock assemblages, has apparently not yet been found in Australia or any other part of the World.

After the accumulation of these older Archaean lavas and sediments came a period of intense earth-movement during which the rocks were, in most places, tightly folded and regionally metamorphosed. The folding (about 3,000 million years ago) was accompanied by widespread granitic intrusions, some of which consolidated into primary gneisses whereas others soaked into the pre-existing rocks, penetrating them along bedding planes, joints, and other fractures, and so forming hybrid granitic gneisses by granitisation.

Where they were not affected by this First Granite Invasion, the volcanic rocks of the Kalgoorlie-Yilgarn and Pilbara Systems were regionally metamorphosed, in some places very strongly into dark-coloured schists, in others only very slightly. Similarly, the sedimentary rocks of the Kalgoorlie-Yilgarn and Pilbara Systems, where they have escaped granitisation, are in some places only slightly regionally metamorphosed slates and phyllites, in others they are highly metamorphosed and converted into various types of schist and quartzite.

All the Archaean rocks described above were invaded by the 'Younger' Granite, which, unlike the 'Older' Granite, formed well-defined intrusions many of which are stocks, though smaller offshoots from the same magma, in the form of 'porphyry dykes', occur at nearly every mining centre. These events occurred after the folding but before Proterozoic times. Any of the Archaean rocks in Western Australia may contain ore-bodies yielding gold and other minerals of economic value containing metals of economic value such as tin, tantalum and tungsten. It seems likely that many of these ore-deposits were formed at the time of the Second Granite Invasion which, from radioactive age determination studies, occurred about 2,700 million years ago. Important iron-ore deposits also occur in the Archaean rocks at many localities, for example at Mount Goldsworthy in the Pilbara, Talling Peak in the Yalgoo Goldfield, and Koolyanobbing, Bungalbin and many other localities in the North Yilgarn. These are all sedimentary banded ironstone deposits which are interbedded with the basaltic lavas and sedimentary rocks of early Archaean age. In many places there are important manganese deposits associated with these banded iron formations. A rich nickel deposit discovered in ultrabasic Archaean rocks at Kambalda near Kalgoorlie in 1966, has now become an important source of nickel. Base metal ore deposits, such as nickel, cobalt and chromium, are generally associated with ultrabasic igneous rocks. Ultrabasic rocks are intrusive into or interbedded with the older Archaean volcanic and metasedimentary rocks of the Kalgoorlie-Yilgarn System



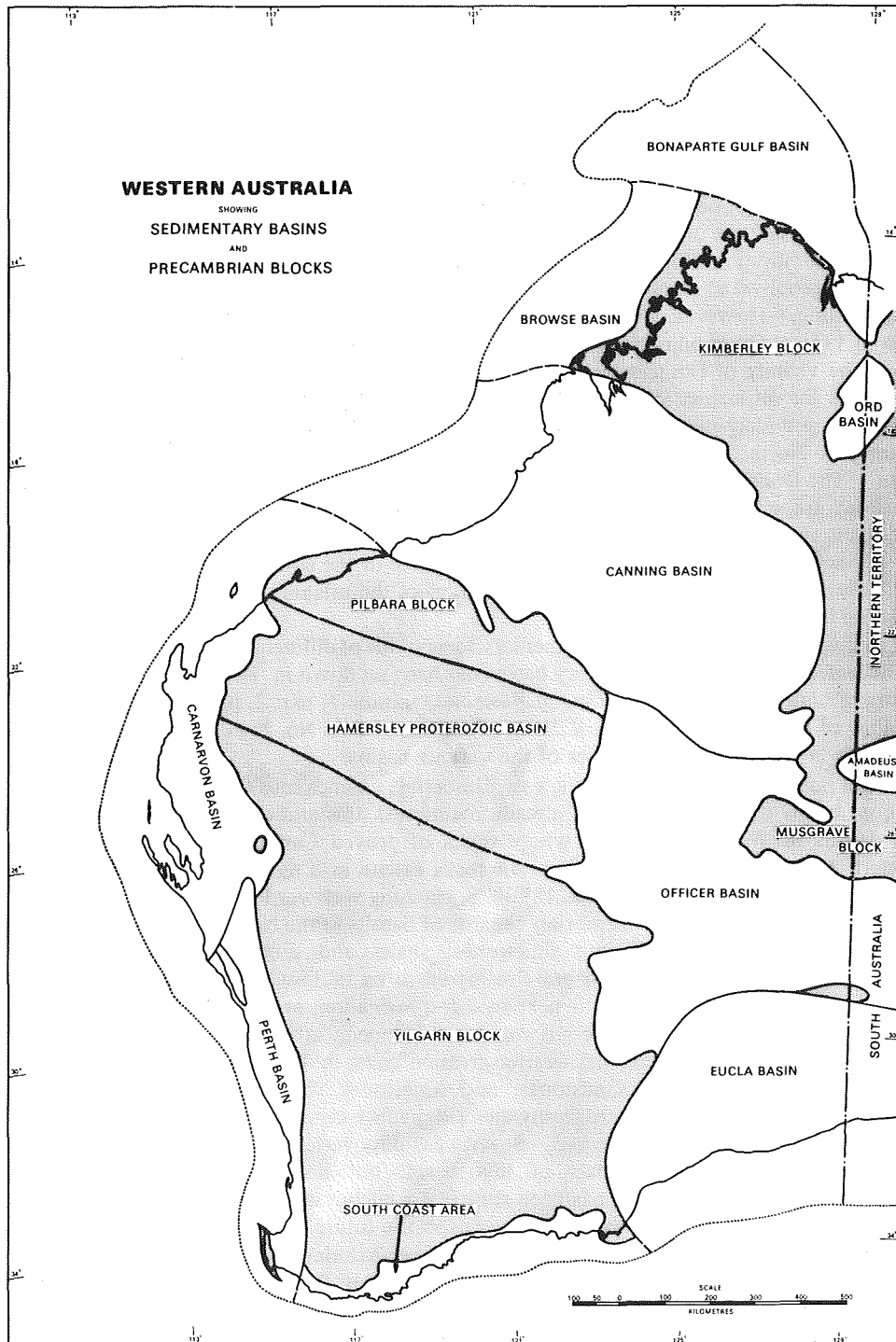
in the country between Norseman and Laverton, and important nickel deposits have been discovered, evaluated, and are now being exploited at localities such as Kambalda and Scotia near Kalgoorlie, Mount Windarra near Laverton and Mount Keith near Agnew. Between 2,300 and 2,400 million years ago basic dykes (N-S in the Pilbara Block and E-W in the Yilgarn Block) were intruded.

Finally, in Proterozoic times we had the deposition, under shallow-water conditions, of conglomerates, sandstones, shales and banded iron formations, another period of volcanic activity yielding basaltic lava flows and three periods of granite intrusion (at 1,700 million years ago in the Pilbara, 1,100 million years ago along the south coast and 600 million years ago in the Paterson Range, east of the Pilbara Block). Other than in a few narrow belts and a peripheral belt around the Yilgarn Block, these rocks have not suffered the intense earth movements which affected the older rocks, and so are practically un-metamorphosed. Important blue asbestos deposits in these rocks have been exploited at Wittenoom Gorge in the Hamersley Range of the West Pilbara. The asbestos deposits occur in banded ironstone formations which also contain large iron-ore deposits. The well-known iron-ore deposits of Cockatoo and Koolan Islands in Yampi Sound, which have been exploited since 1951, are metasedimentary deposits of Late Proterozoic age. Although the Proterozoic rocks cover extensive areas in the northern parts of the State they have largely been stripped off the southern half by erosion. The final episode in the Precambrian history of this State was the widespread intrusion of dolerite dykes approximately 550 million years ago. Small lead and copper deposits are closely associated with these dolerite intrusions in the Northampton Mining Field, where the discovery of a lead deposit at Geraldine in 1848 led, in 1852, to the first commercial metal mining operations in Western Australia.

### **The Sedimentary Basins**

There are five major post-Proterozoic sedimentary basins in Western Australia and the adjoining continental shelf as shown in the following map — the *Bonaparte Gulf Basin* in the north-east part of the Kimberley Division extending into the Northern Territory, the *Canning Basin* of the west Kimberley, the *Carnarvon Basin* of the North-West, the *Perth Basin* extending from lat. 29° S to lat. 33° S and the *Eucla Basin* occupied by the Nullarbor Plain. All of these basins have offshore extensions as shown in the following map. Large areas of the Central Division are covered by sediments of the *Amadeus Basin* of Central Australia and the shallow *Officer Basin*. In the east Kimberley, the *Ord Basin*, with a sequence beginning with basaltic volcanics of Cambrian age, extends into the Northern Territory. In addition to these major basins there are smaller basins such as that at Collie and scattered areas where sediments, which are dominantly lacustrine in nature, have been deposited. In these sedimentary areas we find sediments ranging from Lower Palaeozoic to Pleistocene in age. These sediments of Palaeozoic and later age are, as a rule, less disturbed than those of Precambrian times and many are abundantly fossiliferous. Therefore, there is a sure means of correlating formations even in widely separated places, and so our knowledge of the history of these sedimentary areas is more detailed than that of the much altered, highly folded, un-fossiliferous Precambrian rocks of the basement.

Apart from the superficial deposits the economic significance of these basins is confined to their possibilities for the occurrence of artesian water, coal, oil and natural gas. A prime requisite for the occurrence of artesian and sub-artesian water is the occurrence of interbedded strata of varying porosity and permeability. These conditions are met in a number of the sedimentary basins in Western Australia and the development of the pastoral industry in the arid or semi-arid parts of these basins has been largely dependent on the occurrence of artesian water. In the metropolitan area, artesian bores are an important source of water supplies, although these deep, pressure-water bores have become, of recent years, of secondary importance to the shallow groundwater of the Wanneroo and Jandakot Mounds. Coal deposits are also confined to areas of sedimentary rocks and occur in the Permian rocks of several of the



POST-PROTEROZOIC SEDIMENTARY BASINS AND PRECAMBRIAN BLOCKS OF WESTERN AUSTRALIA  
(PRECAMBRIAN AREAS STIPPLED)

minor basins, namely the *Collie*, *Wilga* and *Irwin River Basins*, and in the Lower Jurassic sediments of the Perth Basin (at Eneabba, where a seam thirty metres thick has been found at a depth of 1,800 metres in a borehole sunk in search of oil, and is indicated in shallow shot-holes in the Hill River area). Up to 1966 the coal deposits of the lacustrine Permian beds of the Collie Basin constituted the only power source in Western Australia, since oil of commercial significance had only then been proved and the gently undulating topography combined with low rainfall make the hydro-electric resources insignificant. So far as oil is concerned the first occurrence of flow oil in Australia was encountered in Rough Range Bore No. 1, in the Carnarvon Basin, late in 1953. This discovery of flow oil resulted in an increase in the rate of geological exploration of all the major sedimentary basins. The results of extensive geological mapping, geophysical surveys and exploratory drilling for oil have to date been rather disappointing. However, a commercial field was proved at Barrow Island off the north-west coast in 1966. Other oil occurrences have been located at various localities in the Perth Basin, e.g. in the vicinity of Dongara and this indicates the presence of suitable source material and conditions for oil formation and preservation. Moreover, oil search drilling operations have located some widely-spaced important finds of natural gas at Dongara and Gingin in the Perth Basin, and North Rankin and Goodwyn in the offshore part of the northern Carnarvon Basin. The Dongara gasfield is now being exploited for the metropolitan area of Perth and the industrial areas further south. The possibilities of locating other commercial oilfields and gasfields in the Carnarvon, Canning and Perth Basins are by no means exhausted and the search is being actively continued both on land and offshore in the continental shelf area. Intensive feasibility studies concerned with the exploitation of the offshore gasfields of the North West Shelf are at present under way.

A detailed description of the sedimentary formations of different ages, from the Cambrian to the Recent, in the various sedimentary basins has been set down in 'The Stratigraphy of Western Australia' (*Journal Geological Society of Australia*, volume 4, part 2, pp. 1-161, 1958) and 'The Geology of Western Australia' (*Geol. Surv. West. Aust. Mem. No. 2*, 1975). It is proposed here merely to indicate the main features of the various basins.

The *Bonaparte Gulf Basin*, in the east Kimberley, extends into the Northern Territory and offshore below the Timor Sea. As already mentioned, this and the nearby *Ord Basin* are the only basins in Western Australia where rocks of proved Cambrian age are exposed. On Western Australian territory the Cambrian rocks extend as a narrow belt along the interstate border between lat. 16° 15' S and lat. 18° 30' S, reaching westward from the border for twenty-four to 120 kilometres. The Cambrian consists of basalts at the base of the sequence, overlain by Middle Cambrian fossiliferous limestones, shales and sandstones. There is a small development of sandstones which are considered to be of Lower Ordovician age, following which there is a big time gap and the next youngest formations are sandstones and limestones of Upper Devonian and Lower Carboniferous age. Upper Carboniferous and Lower Permian formations are absent, the next marine transgression being in the Middle Permian when a thick sequence of conglomerates, sandstones, and limestones was deposited. The only other sedimentary rocks in this basin are freshwater sediments (siltstones, marls and cherts containing freshwater fossils) of late Tertiary age. Several gas discoveries and a single oil discovery have been made in the offshore part of this basin, but none is commercially viable at present. However, exploration has been sufficiently encouraging to suggest that the basin has reasonable prospects for commercial discoveries in the future.

The *Canning Basin* (formerly named the Desert Artesian Basin), in the west Kimberley, extends from the coast between Derby and the De Grey River in a south-easterly direction almost to the 128° meridian. The north-east or Fitzroy part of this basin consists of a comparatively narrow and shallow section (the Lennard Shelf) flanking the Precambrian land mass to the north, and a deep trough (the Fitzroy Trough) estimated, from aeromagnetic geophysical surveys, to contain a thickness of the order of 6,000 metres of sedimentary strata

ranging in age from Ordovician to Triassic. It was in this area that bores seeking oil were first drilled in Western Australia, following the discovery in 1919 of traces of oil in a water bore on Gogo Station. The larger Canning Desert portion, the South Canning Basin, is covered by a relatively thin Mesozoic and Permian sequence, but geophysical work followed by some deep drilling has indicated that there are deep depressions in this area, the deepest of which is the Kidson Sub-basin, which has a basement approximately 6,000 metres below the surface.

The oldest Palaeozoic sediments in the Fitzroy portion of the basin are richly fossiliferous limestones of Ordovician age outcropping near Price's Creek. These are overlain by Devonian reef limestones, sandstones and conglomerates, followed by Carboniferous sandy limestones. These in turn are followed by a thick Permian sequence of sandstones (of marine glacial origin deposited from floating ice), fossiliferous calcareous shales and limestones, and Upper Permian fossiliferous ferruginous siltstones and sandstones. All of these formations dip gently in a general south-westerly direction towards the centre of the basin but these regional dips are interrupted by local folding. Shale and sandstone beds of Triassic age occur in the Fitzroy Trough section of the basin. The youngest rocks in this area are igneous extrusive lava flows and intrusive sheets, dykes, and volcanic necks which have been found intruding all rocks of the sequence from the Precambrian granitic basement to the youngest sediments (Triassic) present. These igneous rocks, from direct geological evidence, are of post-Triassic age, and radioactive age determinations made in 1959 indicate that they were intruded 180 million years ago (*i.e.* in Jurassic times) although more recent dating studies indicate they were emplaced in Early Miocene times (approximately 20 million years ago). This is one of the two areas in the whole of Western Australia where post-Cambrian igneous activity is known. It is interesting to note the occurrence of a small lead deposit in Devonian limestone at Narlarla in the Napier Range. This is the *only* primary metallic ore deposit of post-Proterozoic age known in Western Australia and it may be genetically related to the Jurassic igneous activity or may have been deposited from sea water by organisms during Devonian times. In 1978, diamonds were found in 'kimberlitic' plugs probably related to these Jurassic igneous rocks, and evaluation of these deposits is now taking place to determine their commercial viability.

In the Canning Desert section of the basin the Palaeozoic rocks are not well exposed and the greater part of this portion of the basin (where not obscured by superficial unconsolidated sands) is occupied by Mesozoic sediments ranging in age from Lower Jurassic to Lower Cretaceous. The deep depressions in the floor of the South Canning Basin are filled with Palaeozoic sediments as proved by the first deep oil test well (Kidson No. 1) which was abandoned at 4,431 metres in Lower Ordovician limestone. There is no evidence in the entire basin of any marine transgression after Lower Cretaceous times.

The basin extends some 320 kilometres offshore to the coral islands of the Rowley shoals where some wells have been sunk in the search for oil. Drilling in search of oil and gas both onshore and offshore has to date proved disappointing, and no commercial discoveries have yet been made.

The *Browse Basin*, a wholly offshore basin, is situated offshore from the North Kimberley Precambrian Block. It contains a thick sequence (at least 12,000 metres) of Carboniferous to Tertiary sediments. The first well drilled in this basin was in 1971, when Scott Reef No. 1 (drilled in an atoll rising from the continental slope about 400 kilometres north-west of Derby) made a major gas/condensate discovery at depths between 4,296 and 4,389 metres. Other wells, drilled to date, on the continental shelf part of the basin have been dry.

The *Carnarvon Basin* (formerly called the North-West Artesian Basin) has been the most intensively studied of the major sedimentary basins in Western Australia. It extends along the west coast from near Dampier as far south as the mouth of the Murchison River, the maximum width of the basin being 200 kilometres at the latitude of Carnarvon. In this basin the eastern portion up to eighty kilometres wide is occupied by a thick sequence of marine Palaeozoic sedimentary rocks ranging in age from Middle Devonian to upper Middle Permian, all of which

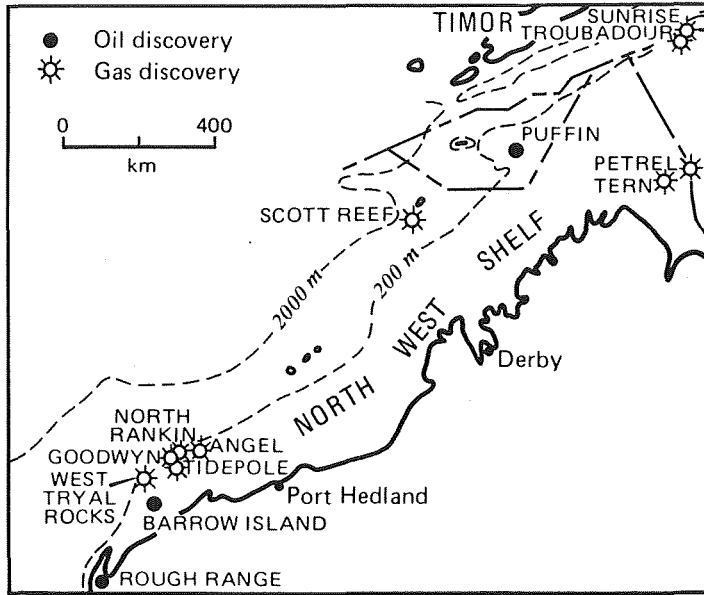
have a westerly regional dip. This Palaeozoic sequence which consists of fossiliferous Devonian limestones and sandstones, Carboniferous limestones and Permian marine glacial beds, limestones, sandstones, and shales, is almost entirely marine in origin. In the Carnarvon Basin we have the only wholly marine Permian sequence in Australia, and without doubt one of the thickest marine Permian sequences in the world.

No rocks of Silurian age were known from the western half of the Australian continent until 1957 when a bore sunk by West Australian Petroleum Pty. Ltd. at Dirk Hartog Island in Shark Bay encountered limestones of Silurian age underlain by sandstones which are now correlated with the reddish sandstones which outcrop in the lower reaches of the Murchison River.

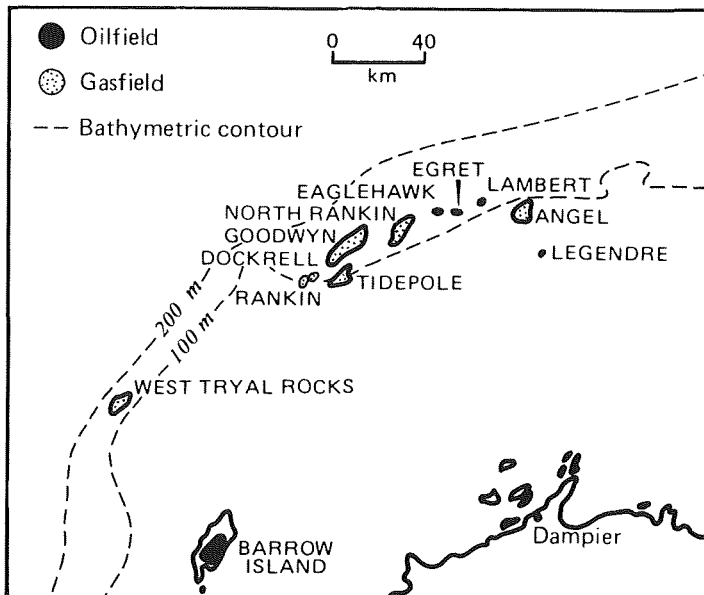
To the west the Permian rocks are unconformably overlain by Cretaceous sandstones, shales, marls and limestones attaining a total thickness of 600 metres. It is the basal formation, the *Birdrong Sandstone*, of the Cretaceous sequence that is the oil sand encountered in Rough Range Bore No. 1. Another Cretaceous formation, the *Windalia Formation*, is one of the important oil reservoirs of the Barrow Island Oilfield. The Cretaceous rocks outcrop in a north-south belt averaging eighty kilometres wide between the Palaeozoic and Precambrian rocks on the east and the Tertiary limestones to the west. The only other Mesozoic formation exposed at the surface in this basin is a Jurassic sandstone eight metres thick. However, a deep well (Cape Range No. 2) drilled in search of oil at Exmouth Gulf, after passing through the base of the Cretaceous at 1,130 metres, entered the Lower Jurassic which extended to the depth of 4,624 metres at which the bore was discontinued, thus proving a thickness of at least 3,494 metres of Lower Jurassic strata in this area. It is apparent that there is a marked thickening of the Mesozoic formations from east to west in this area. The westernmost belt of the Carnarvon Basin is occupied by Tertiary strata, mainly limestones, which are well exposed in the Rough and Cape Ranges of the Exmouth Gulf area. These limestones, which range from Lower Miocene to Pliocene in age, total 365 metres in thickness and are discontinuously overlain by Pleistocene and Recent beds approximately 135 metres thick. Marine Tertiary sediments which are so well developed along the western margin of the basin extend as a thin discontinuous formation unconformably over the Permian beds of the eastern part of the basin, indicating that in Upper Eocene times the sea transgressed practically the whole of the Carnarvon Basin.

The sedimentary rocks of the Carnarvon Basin were affected by earth movements at various times. Even the youngest of the Tertiary rocks have been thrown into gentle folds which are significant so far as the search for oil is concerned because, in addition to having suitable conditions for the formation and preservation of oil, suitable structures are necessary for its concentration into local areas (oil 'pools'). So far as structure is concerned, the general picture of the Carnarvon Basin is the gentle westerly regional dip of the Palaeozoic sediments of the eastern half of the basin and the gentle dome and basin folding of the western half.

Offshore extensions of the northern part of the Carnarvon Basin have proved to be economically important, for it is here that the Barrow Island Oilfield is situated. A number of Permian to Recent epicontinental basins lie offshore between the coast and the edge of the Continental Shelf, extending north from North West Cape to the Browse Basin. It is in this area that the rich gas fields (North Rankin, Goodwyn and Angel) of the North West Shelf are situated. These major gas/condensate discoveries, shown in the accompanying sketch maps, were made in the period 1971-3. North Rankin is the largest and with estimated reserves of 242,700 million cubic metres of gas and 29 million cubic metres of condensate is the first field planned for development. Total proved and probable recoverable reserves of the four potentially economic fields are estimated at more than 410,000 million cubic metres of gas and 57 million cubic metres of condensate. Current major exploration interest in the Carnarvon Basin is now centred on the Exmouth Plateau, west of the Rankin Platform, but no finds have resulted to date. This is a major faulted uplift, in water 800 to 2,000 metres deep, and the stratigraphy resembles that of the Rankin Platform.



Oil and gas discoveries and bathymetry of the North-West Shelf (above) and the offshore northern Carnarvon Basin (below) (from Playford, in Prider 1979, by courtesy University of Western Australia Press).



The *Perth Basin* (formerly called the Coastal Plain Artesian Basin) is a narrow elongated basin on the western border of Western Australia extending from Geraldton in the north to Cape Leeuwin in the south. At Geraldton it is about fifty kilometres wide and is flanked both to the west and east by Precambrian crystalline rocks (mainly gneisses). The maximum width of the basin is approximately eighty kilometres at Watheroo and it narrows again to the south being approximately fifty kilometres wide in the sunland between Busselton and Augusta. At this southern end it is again flanked both to the east and west by Precambrian rocks. The surface of the basin is mostly covered by Recent sands but occasional outcrops of rocks as old as the Permian occur in places. The only evidence available regarding the structure, thickness and age of the sediments in the basin is that provided by geophysical surveys, some deep bores sunk in the search for oil and a number of water bores up to 730 metres deep in the metropolitan area. Gravity surveys indicate that there is a very considerable thickness of sediments, perhaps exceeding 9,000 metres, and it is probable that in this basin we have a complete succession from the Younger Proterozoic (*Cardup Group*), which outcrops along the Darling Scarp, to the Recent sands. Other than the Proterozoic of the Darling Scarp, the oldest sediments exposed are the gently folded Permian marine sediments of the *Eradu* and *Irwin River Basins* at the north end of the main basin. The Permian sediments of the Irwin River area have a total thickness of 1,200 metres and vary from marine glacial beds at the base (as in the Carnarvon and Canning Basins) through fossiliferous marine shales and limestones to lacustrine sandy sediments with coal seams in the upper part of the sequence. Marine and continental Jurassic limestones and sandstones outcrop east of Geraldton and Jurassic beds, overlain by Cretaceous chalks and greensands, occur near Gingin and Dandaragan. In the southern part of the Perth Basin the oldest rocks exposed (if we except the Permian of the separate minor *Collie Basin* which is situated well to the east of the Darling Scarp in a glacially-gouged trough) are the Cretaceous *Donnybrook Sandstones*.

In the vicinity of Perth, artesian bores to a maximum depth of 730 metres expose a sequence varying from Jurassic sandstone at depth, through Cretaceous and Paleocene shales. The *King's Park Shale* of Paleocene (older Tertiary) age is overlain by Pleistocene aeolian sandstones of the *Coastal Limestone Formation*, the base of which is approximately thirty metres below sea-level. There is therefore a big gap in the succession here between the Paleocene and Pleistocene. Many boreholes have been sunk in the north-central part of the basin in the course of oil search operations. Boreholes near the coast (at Jurien Bay and Beagle Ridge) struck Precambrian crystalline basement rocks at comparatively shallow depths of 1,024 metres and 1,481 metres. The sediments thicken further inland, as evidenced by the increasing depth to the Precambrian basement in Cadda No. 1 (2,744 metres), Woolmulla No. 1 (2,810 metres) and Arrowsmith No. 1 (3,420 metres). Very thick sedimentary sequences have been disclosed by Eneabba Bore No. 1 (which bottomed in Lower Triassic at 4,179 metres) and Gingin No. 1 (in Lower Jurassic at 4,544 metres). Some deep wells have been drilled to the south of Perth, namely Pinjarra No. 1 which bottomed in Upper Triassic sandstone at 4,572 metres; in the far south (near the south coast), Sue No. 1 which encountered Precambrian granulites at 3,054 metres; near Perth, Cockburn No. 1 which was abandoned at 3,054 metres in Lower Jurassic sandstone; Whicher No. 1, near Busselton, which reached a depth of 4,653 metres in Permian sandstone before being abandoned; and Blackwood No. 1, abandoned at 3,334 metres in Permian sediments. The first offshore well in the Perth Basin (Quinns No. 1), spudded in on 10 October 1968 at a location approximately thirty-two kilometres north of Rottnest Island, was drilled to a depth of 2,209 metres without finding hydrocarbons. Some oil was found in a second offshore well (Gage Roads No. 1), drilled to a depth of 3,660 metres, approximately fourteen kilometres north-west of Rottnest Island.

Oil search operations in the Perth Basin have led to the discovery of significant oil and gas in the vicinity of Dongara near the northern end of the Basin and gas at Gingin, about eighty kilometres north of Perth. These discoveries, now proved as gasfields, are supplying natural gas

to the metropolitan area and industrial areas south as far as Pinjarra. In late 1980 there were significant gas finds at Woodada, approximately fifty kilometres north-west of Eneabba. The other materials of economic significance in the Basin are coal, groundwater, limestone from the Pleistocene Coastal Limestone which is used as a source of lime and as building stone ('Cottesloe Stone'), and sand and clays for building materials. In addition, the Coastal Limestone contains picturesque caves of tourist attraction such as those of Yanchep, Yallingup and Margaret River.

The only evidence of igneous activity in the Basin is the Cretaceous basalt of the sunkland between Bunbury and Cape Gosselin on the south coast.

Very little is known about the structure of this basin. It is bounded to the east by a large fault or monoclinial fold. The evidence available indicates that the main structural character of the deeper part is a regional dip to the east (of  $15^{\circ}$  to  $20^{\circ}$ ) traversed by north-south trending faults with down-throws to the west. There is an unconformity (Upper Jurassic to Lower Cretaceous) at a depth of approximately 600 metres above which the Cretaceous and Tertiary sediments are almost horizontal.

The *Eucla Basin* occupying the Nullabor Plain, in the south-eastern corner of the State, is occupied at the surface by marine fossiliferous Middle Tertiary (Miocene) limestones with a marginal belt of Lower Tertiary (Eocene) limestones. The Tertiary rocks lie on sandstones and shales of probable Cretaceous age, which in turn overlie the Precambrian crystalline rocks. Little is known of the details of the stratigraphy and structure of the Eucla Basin since the beds are very flat-lying and have only been penetrated by water bores in a few places such as Madura near the coast and Loongana on the Trans-Australian Railway. The Madura bore is artesian but bores along the Trans-Australian Railway have only yielded sub-artesian water (*i.e.* the water will rise under pressure only part of the way to the surface). The oil prospects of this basin are poor because of the comparatively small thickness (600 metres) of the sediments and the absence of suitable folded structures to form oil traps.

The *Officer Basin* covers an extensive area of about 300,000 square kilometres in the Eastern Division of the State and extends into South Australia. It consists of Proterozoic sediments with a comparatively thin cover of the order of 1,000 metres of Permian glacial and Cretaceous sediments. One well drilled in this basin in 1966 entered presumed Proterozoic rocks at shallow depth and was abandoned. Since then, there has been no significant exploration and prospects for oil or gas are believed to be very low.

The south coastal area, known as the *Bremer Basin*, has a thin Tertiary sequence of about 200 metres overlying basement Precambrian gneisses and, because of the thin sedimentary sequence and limited area, petroleum prospects are considered to be very poor.

The *Collie Coal Basin*. Of the minor basins and isolated occurrences of post-Proterozoic sediments, Collie, since it is the only operating coalfield in Western Australia, is the only one which will be considered here. It is situated approximately 160 kilometres SSE from Perth, and has an area of about 260 square kilometres. Actually it is made up of two basins separated by a sub-surface granitic ridge. It is composed of sandstones and shales with interbedded coal seams and is surrounded by Precambrian rocks. The coal measures, of Permian age, are of the order of 600 metres in thickness of which approximately forty metres is coal. The actual contact between the Permian coal measures and the Precambrian granitic basement has nowhere been seen at the surface but has been encountered in deep drill holes in various parts of the Basin. Such drill holes reveal that Permian mudstone containing granite pebbles lies on an ice-planed surface of the Precambrian granitic rocks. This suggests that the Collie Basin, formerly considered to be a block of the Permian downfaulted into the Precambrian basement, is actually a glacially-gouged trough formed by terrestrial glaciation in the Permian and since filled with Permian lacustrine sediments. Coal occurs at three horizons and the seams, which average two metres in thickness, persist over fairly long distances. From the associated plant fossils these coal measures appear to be comparable in age with those of the upper part of the Permian



sequence at the Irwin River near the northern end of the Perth Basin. There is another similar basin, containing Permian coal measures, the *Wilga Basin*, of about fifty square kilometres extent, approximately thirty kilometres SSE of Collie. There may be other small glacially-gouged Permian basins in the southern part of the State, which are yet unknown. [An early history of the discovery of coal and other minerals in the Colony of Western Australia was published in the *Western Australian Year Book* for 1900-01, page 76. See also the history of the Department of Mines in the 1977 Year Book. Ed.]

### The Superficial Deposits

Over a great part of the State fresh rock outcrops are comparatively sparse. Most of the country is covered by highly-weathered rocks, laterite, drift sand, soils, and, in the arid salt lake country, by calcrete and thin evaporite deposits.

*Laterite.* In the southern half of the State the remnants of the Darling Plateau are covered by a thin layer up to three to five metres thick of a reddish-brown rock composed of spherical pebbles tightly or loosely cemented together by a lighter-coloured earthy matrix. This material in its poorly consolidated state is popularly referred to as 'ironstone gravel' and when strongly cemented as 'ironstone'. This rock, called laterite, although it covers large areas, is purely superficial and wells or bores sunk in it pass within a few metres into highly weathered country rock which may extend down for distances up to thirty metres before encountering fresh unweathered rock. This laterite crust and the underlying highly weathered country rock were developed on a gently undulating surface during a period of warmer, more humid, climatic conditions. These tropical conditions probably existed in Late Tertiary (Pliocene) times when a great part of Western Australia had been reduced by long-continued erosion to a peneplain lying close to sea-level, or soon after, when this peneplain had been uplifted to form the *Darling Plateau*. This uplift, judged by the elevation of the laterite-capped hills and the occurrence of fossiliferous marine Eocene sediments 270 metres above sea-level at Norseman, was of the order of 300 metres. On the Great Plateau, remnants of this Darling Plateau are evidenced by the table-topped hills so characteristic of much of the Plateau country. The significance of the laterite profile and the soils developed from the laterite and associated weathered rocks has already been mentioned. Economically, the laterite is important for road-making materials and in a few places (such as Wundowie) as an iron ore. The main constituents of the laterite are the insoluble products of intense rock weathering — iron oxide, alumina and silica. In many places the alumina content is sufficiently high to call them bauxite. Bauxites are the main source of aluminium, and the bauxitic laterites of the Jarrahdale and Del Park-Huntly areas in the Darling Range near Perth are being exploited as aluminium ore. Bauxite deposits further south, near Wagerup, are now being developed for mining.

The mid-Tertiary land surface of the southern half of Western Australia on which the laterite profile was developed at a time when this country was subjected to a tropical climate extends into the northern part of the State. In the Hamersley Iron Province of the North-West Division this old land surface truncated the Lower Proterozoic banded iron formations of the Hamersley Group. At and below this old land surface (the *Hamersley Surface*) which can be traced without tectonic break from sea-level to elevations of 1,200 metres, there was a secondary concentration of the iron of the Lower Proterozoic rocks resulting in extensive rich iron-ore deposits which make this area one of the richest iron provinces in the world. Some of the iron ore deposits, such as the pisolitic limonite deposits capping mesas along the Robe River, are iron-rich laterites. Such deposits have been mined at Pannawonica, and extensive unexploited deposits occur at Deepdale, further downstream.

In the far south-west of the State sub-surface hard pan formations consisting of ferruginous sandstone are a potential source of low-grade iron ore.

*Soils and drift sands.* Western Australia, an area of 2,525,500 square kilometres extending from lat. 13° 44' S to lat. 35° 08' S, although having little variety in its broad physical features,

has very considerable variation in climates from the tropical areas of summer rainfall in the north through a central and inland province of low rainfall to the temperate areas of winter rainfall in the south. Moreover, throughout this enormous area there is very considerable variation in the nature of the country rocks. The nature of the soils developed is dependent on these two factors — climate and parent rock — so it will be apparent that there will be very considerable variation in the soils over this extensive area. L. J. H. Teakle has recognised the following major soil zones of Western Australia:

1. Grey, yellow and red podsolised, or leached, soils of the temperate sclerophyll forests.
2. Red-brown earths of the eucalyptus-acacia woodlands.
3. Grey and brown calcareous, solonised soils of the low rainfall eucalyptus woodlands — ('mallee' soil zone of Prescott).
4. Red and brown acidic soils of the acacia semi-desert scrub — mulga, etc.
5. Brown acidic soils of the spinifex semi-desert steppes of the north-west.
6. Pinkish-brown calcareous soils of the Nullarbor Plain desert shrub steppes.
7. Pinkish-brown calcareous soils of the acacia semi-desert scrub, mallee and salt bush-blue bush zone.
8. Brown soils of the tropical woodlands, savannahs and grasslands.
9. Red sands of the central desert sandhills — spinifex with desert acacias, desert gums and mallees (*Eucalyptus spp.*).

Each of these major soil zones may be subdivided into one or more soil regions and the reader is referred to a paper 'A Regional Classification of the Soils of Western Australia', by L. J. H. Teakle (*Jour. Roy. Soc. West. Aust. XXIV*, pp. 123-95) for details concerning the soil characteristics of these various zones and regions.

There are considerable areas of Western Australia covered by drift sand which may be in the form of parallel red sand dunes or, in the southern part of the State, extensive sandy plains. The latter have been generally considered to be residual from the weathering of granite and to have suffered little or no transport. These sand plains are often underlain by lateritic material and they probably represent the leached zone of the laterite profile. The youngest of the drift sand deposits are the coastal sand dunes.

Coastal sand deposits are of considerable economic importance. At various places along the south and west coasts there are beach sand deposits in which there is a natural concentration of heavy minerals such as zircon, monazite, xenotime, rutile and ilmenite. Such deposits are at present being exploited at Capel and Bunbury for their ilmenite content, which is valuable because of its low chrome content. The other heavy minerals such as zircon, monazite and xenotime are also being exported overseas. Similar deposits have been discovered at Eneabba (approximately thirty kilometres inland at 240 kilometres north of Perth) — deposits which have been evaluated and are now being exploited.

Many soils are residual accumulations resulting from the weathering of rocks *in situ*. Where the parent rocks contain weather-resistant minerals such as gold and cassiterite, these minerals will be preserved in the residual soils. Such residual accumulations are called eluvial deposits. Most of the so-called 'alluvial' gold deposits of Western Australia are not true alluvials (which are deposits from running water), but are residual eluvial deposits. The distinction between eluvial and alluvial deposits is important in prospecting.

**Calcrete.** Throughout the arid and semi-arid parts of inland Western Australia, former stream channels are now represented by elongate areas of calcrete deposition or by elongate salt lakes. Calcrete is chemically-deposited calcium carbonate. These calcretes, because they contain networks of solution channels, have a high permeability and therefore are aquifers in which underground water may occur. Such groundwater has been of considerable significance in the establishment of mining communities in outback arid areas. In calcretes of some areas (such as Yeelirrie, south of Wiluna), uranium deposits have been formed from circulating waters

draining areas of weathering Precambrian rocks, mainly granites, which contain small amounts of uranium-bearing minerals. Such secondary uranium deposits are of potential economic significance.

*Salt lake deposits.* These, together with the coastal sand deposits, represent the youngest of the geological formations developed — indeed they are in course of formation at the present time. They are evaporite deposits resulting from the evaporation of lake waters in the areas of internal drainage. Soluble salts produced by rock weathering are leached out by rain and running water and transported by streams to these lakes. During the long dry summers most of these lakes dry up and the soluble salts are deposited, yielding accumulations of gypsum and common salt. In a few of these inland lakes hydrated potassium aluminium sulphate (alunite), which is a valuable source of potash for fertilisers, has been formed but its actual mode of formation has not yet been satisfactorily explained.

Valuable potash reserves occur at Lake MacLeod, north of Carnarvon. This 2,700-square kilometre coastal lake contains brines rich in potash salts (which are the last salts to crystallise on the evaporation of sea water) saturating the mud of the lake floor. Attempts have been made to exploit these deposits, but to date without success, the only production from Lake MacLeod being sodium chloride.

Solar salt (sodium chloride) is at present being produced at several localities in the north-west, such as Port Hedland, Exmouth Gulf, Lake MacLeod and Shark Bay, where a combination of low-lying flat topography and shallow marine embayments (such as Useless Loop in Shark Bay) with hot dry climate resulting in high evaporation are the ideal conditions for crystallisation of sea water salts. The production of such solar salt amounted to approximately 4.3 million tonnes in 1979-80. In localities such as Shark Bay, where the waters are abnormally saline, other rocks — limestones — are in course of formation. The Shark Bay area has proved a very fruitful area for research on the formation of various limestones and the information being derived from the study of these presently forming rocks has helped in the interpretation of the significance of such deposits which formed in past geological times.

*Groundwater.* Shallow groundwater, one of the most recent accumulations, has become of major importance in Western Australia, particularly in the arid areas of the developing mining areas of the Pilbara, and in supplementing the surface-conserved waters used in the Perth Metropolitan Area. In the Pilbara, the development of the vast iron ore resources has depended largely on the exploitation of shallow underground water supplies. Port Hedland obtains its water mainly from colluvium beneath the coastal plain, which is periodically replenished by river floods. Other coastal towns obtain their water supplies from Millstream, where a mass of cavernous calcrete, some forty kilometres long and up to twelve kilometres wide, occupying the former course of the Fortescue River, forms a highly productive shallow aquifer. The inland mines and towns of Newman, Pannawonica, Paraburdoo and Tom Price, obtain the bulk of their water from river alluvium and calcrete aquifers, although some groundwater comes from fractured volcanic rocks in some places. In the Perth metropolitan area there are two distinct types of groundwater — the deep, confined, pressure (artesian and sub-artesian) water occurring in Mesozoic bedded sedimentary rocks and shallow unconfined, water-table groundwater in the superficial formations consisting of a complex sequence of sand, limestone and clay up to ninety metres thick. It is the latter type that has been most extensively exploited over recent years by both the Government Water Supply Department and household bores throughout the coastal plain section of the Metropolitan Area.

## Conclusion

From the foregoing summary of the geology of Western Australia we see that, although nowhere do we find the complete geological succession, somewhere in the State there are deposits representative of every Period. The geological history of Western Australia begins with the basaltic igneous activity of the Early Archaean some 3,000 million years ago, followed

by sedimentation, intense mountain building activity and associated granitisation and granite intrusions. In post-Archaeon times there is a record of sedimentation throughout all the main geological periods. Igneous activity ceased in the Lower Palaeozoic and only recurred during the late Mesozoic, yielding the basaltic lavas of the far south-west and the volcanic rocks of the west Kimberley. By mid-Tertiary times much of Western Australia had been reduced by denudation to a gently undulating peneplain land surface on which, under tropical climatic conditions, there was an extensive development of laterite which in places constitutes valuable bauxite and iron-ore deposits. Geological processes are continuing and at the present day rocks and soils are still in the process of formation.

A more complete description of the geology of Western Australia is contained in 'The Geology of Western Australia' (*Geol. Surv. West. Aust. Mem. No. 2, 1975*).

### The Mineral Deposits

In the foregoing pages mention has been made in various places of the mineral deposits on which the development of Western Australia has been so dependent. These deposits are directly related to geology — the nature of the rocks and their structural relationships — of the areas in which they occur. One would not, for example, look for coal, oil or natural gas in the crystalline Precambrian Shield, nor for gold or nickel deposits in the sedimentary basins that have been described. Moreover, in spite of the fact that the nickel deposits occur in Older Precambrian rocks, not all of these rocks are potential hosts for nickel deposits — they are only likely to occur in the ultrabasic rocks which constitute a very small fraction of one per cent of the Older Precambrian rocks. The following tabulated statement summarises the sequence of events represented in the geological history of Western Australia and the mineral deposits associated with each. This table, read in conjunction with a geological map of any area, will indicate the economically important deposits which could possibly occur in that particular geological environment.

#### GEOLOGICAL EVENTS AND MINERAL DEPOSITS IN WESTERN AUSTRALIA (a)

Era	Main geological events	Economic mineral deposits
CAINOZOIC	15. Weathering and erosion (Present day)	Beach sand deposits, salt, gypsum, sands and clays, peat, alluvial and eluvial deposits (gold, tin, diamonds, etc.), groundwater, uranium in calcrete areas.
	14. Sedimentation (Pleistocene and Recent)	Ilmenite and other black sand minerals, limestone
	13. Peneplanation (mid-Tertiary) and laterite formation	Bauxite Iron and manganese ores Alluvial tin and gold Clays
	12. Sedimentation (older-Tertiary)	Artesian water
MESOZOIC	11. Sedimentation (with Cretaceous basalt outflows and Jurassic volcanic pipes)	Artesian water Oil and gas, coal Basalt for aggregate stone Diamonds in Jurassic pipes
PALAEOZOIC	10. Sedimentation, earth movements, periods of erosion	Coal Oil and gas
PROTEROZOIC	9. Basic igneous intrusions	Road metal (blue metal) Lead, zinc and copper
	8. Sedimentation and minor granitic magma intrusions	Iron ore (of Yampi Sound) Alluvial gold (of Nullagine and Patterson Range)
	7. Chemical sediments (banded iron formations)	Iron ore and blue asbestos (in Hamersley Basin)

GEOLOGICAL EVENTS AND MINERAL DEPOSITS IN WESTERN AUSTRALIA (a) — *continued*

Era	Main geological events	Economic mineral deposits
ARCHAEAN	6. Pegmatite and quartz vein formation from end-stages of granitic intrusions	Tin, tantalum, tungsten, beryllium, lithium, uranium minerals. Gold and silver in early Archaean country rocks (1 and 2)
	5. Intrusion of granitic magma (2,700 million years ago)	Aggregate and building stone
	4. Granitisation — conversion of all pre-existing rocks into granitic rocks — contemporaneous with intense folding, fracturing, and metamorphism of pre-existing rocks approximately 3,000 million years ago	Aggregate and building stone
	3. Intrusion of basic magma forming stratiform layered basic/ultrabasic igneous complexes	Nickel, copper and chromium in ultrabasic rocks
	2. Sedimentation with minor periods of acid volcanic activity	Copper in acid volcanics
	1. Eruption of submarine basaltic lavas and chemical deposition of banded ferruginous cherts	Iron ore

(a) A geological map of Western Australia appears at the beginning of this Part.

### Current Geological Investigations in Western Australia

While much is known about the geology and mineral resources of Western Australia, there is still much to be learned. The foregoing summary account of the geology of Western Australia is based on work carried out in the past, which has increased in tempo during the last decade because of the discovery of important oil, gas and metal-bearing mineral deposits.

At present, geological work in Western Australia is being carried out by the following bodies.

1. The Geological Survey Branch of the Department of Mines of Western Australia, which is engaged in regional geological mapping, special investigations of varied character concerned with groundwater resources, mineral deposits, and engineering geology problems, and problems arising daily, which require geological advice to the public. The major results of the Geological Survey's operations are published annually in the Annual Report of the Department of Mines of Western Australia, in Bulletins issued at irregular intervals and in four-mile or 1 : 250,000 scale geological maps with explanatory notes, which are also issued at irregular intervals. The initial phase of the 1 : 250,000 scale geological mapping of the entire State has been completed and re-mapping of appropriate areas is now being carried out along with more detailed mapping of economically significant areas on 1 : 100,000 and 1 : 50,000 scales.
2. The Geology Department of the University of Western Australia. Research projects are undertaken by members of staff and research students, varying from mapping and petrological-mineralogical projects concerned with the Precambrian rocks which make up the greater part of the State and their associated ore deposits, through petrological and palaeontological work on rocks from the various sedimentary basins, to studies of present-day marine sedimentation. The results of such investigations are published in various scientific periodicals, both in Australia and overseas.
3. Oil exploration companies. Such companies have carried out geological and geophysical surveys of the various sedimentary basins and some offshore areas, and

- are presently engaged in deep-drilling programmes. Attention is now being given to drilling in the offshore continental shelf areas of the Bonaparte Gulf, Browse, Canning, Carnarvon and Perth Basins.
4. Mineral exploration companies. Following the discovery of important nickel deposits at Kambalda and Scotia near Kalgoorlie, and, subsequently, at Mount Windarra near Laverton, and other localities, many Australian and overseas exploration companies became engaged in base metal exploration, particularly in the Norseman to Laverton belt of Precambrian greenstones. The recent increase in the price of gold has stimulated exploration in the various greenstone belts in which auriferous deposits are known to occur, and the discovery of diamonds in the Kimberley Division has led to exploration for diamonds throughout the State.

The continued efforts of these institutions and exploration companies are adding much to our knowledge of the geology of the western third of the Australian continent.

### **Seismicity of Western Australia**

It had been generally considered that Western Australia was a stable block free of seismic activity in the form of earthquakes but this idea was shattered by the occurrence, on 14 October 1968, of a major earthquake centred near Meckering, 135 kilometres inland from Perth. This earthquake, of magnitude 6.9 on the Richter Scale, completely wrecked the town and most farm houses in the vicinity; alarmed numerous residents of Perth; caused minor damage to many buildings in the Perth Metropolitan Area; was felt within a radius of about 640 kilometres; and made people realise that Western Australia was not as stable as was previously thought. On 2 June 1979, another earthquake of magnitude 6.0 on the Richter Scale, resulted in the destruction of the small town of Cadoux, 215 kilometres NE from Perth. Other major earthquakes, such as the Meeberrie earthquake of 29 April 1941 (of magnitude 7.5 on the Richter Scale, the most severe earthquake yet recorded on the Australian continent) and the more recent submarine earthquake of 23 April 1979, of magnitude 7 on the Richter Scale, which originated on the edge of the continental shelf about 260 kilometres NNW of Broome, have tended to pass without much notice since they either occurred in less densely populated areas or were of low intensity. Records show (according to Everingham in a report of the Bureau of Mineral Resources, Geology and Geophysics, *Seismicity of Western Australia*) that there were forty-seven Western Australian earthquakes of local magnitude greater than 3.5 (Richter Scale) recorded in the period August 1959 to June 1965, and 210 less intense earthquakes during the same period.

Most of the recorded minor earthquakes have originated in the Yandanooka-Cape Riche belt of country about 480 kilometres long by fifty kilometres wide, which lies just within the western margin of the crystalline Precambrian Shield. Indeed, all except five of the 210 recorded minor earthquakes of the period 1959 to 1965 originated in this narrow belt which is parallel to the regional geological structure of the older Precambrian rocks of the southern half of Western Australia. It was in this belt that the severe earthquakes at Meckering (on 14 October 1968) and Cadoux (on 2 June 1979) had their origin.

The major fault structure of Western Australia is the Darling Fault which forms the western margin of the Precambrian Shield and the eastern margin of the Perth Basin. It extends meridionally from the south coast for about 1,000 kilometres. It is considered that the total west block downward movement on this fault has been of the order of 9,000 metres to 12,000 metres. In spite of the fact that there is a major negative gravity anomaly over the Perth Basin causing this region to be isostatically unbalanced, no earthquakes have been recorded which originated on this fault — indeed there is no geological evidence of any movement on the Darling Fault for a least one million years. The October 1968 movement on the Meckering Fault indicates that the Precambrian Shield is in a state of compression and would support a hypothesis that the Darling Fault, instead of being a westerly-dipping tension structure with downthrow to the west as commonly thought, is more probably an easterly-dipping compression structure with

the east (continental) block thrust up over the Perth Basin. This would explain the observed stability of the Perth Basin which should, according to the gravity measurements, be a very unstable area. Instead of rising, as it should because of the major negative gravity anomaly, it is being held down by the overthrust continental block.

As has been indicated, the Meckering earthquake has drawn attention to the possibility of earthquake occurrence in south Western Australia and for the necessity to consider this factor when designing large structures. Calculations have been made from records during the period 1960 to 1969 to give an approximate idea of the order of earthquake frequency in the south-west corner of the State. These have indicated that an earthquake of magnitude greater than 6.5 would occur once every fifty years, and one of magnitude greater than 5.5 every ten years, but these figures are thought to be pessimistic because records kept since 1840 suggest a lower average frequency and the data used for these calculations are swamped by the foreshocks and aftershocks of the Meckering earthquake.

#### FURTHER SOURCES OF INFORMATION ON THE GEOLOGY OF WESTERN AUSTRALIA

##### Physical features

JUTSON, J. T. 'The physiography (geomorphology) of Western Australia'. *Geol. Surv. West. Aust. Bull.* 95, 1934.

GENTILI, J. '*Western Landscapes*'. University of Western Australia Press (Sesquicentenary Series), Nedlands, 1979.

##### General geology

BROWN, D. A. and others. *The Geological Evolution of Australia and New Zealand*. Pergamon Press, Oxford, 1967.

CLARKE, E. de C. and others. *Elements of Geology for Australian Students*. University of Western Australia Press, Nedlands, 1967.

McWHAE, J. R. H. and others. 'The Stratigraphy of Western Australia'. *J. Geol. Soc. Aust.*, vol. 4, pt 2, 1958, pp. 1-161.

GEOLOGICAL SURVEY OF WESTERN AUSTRALIA. 'The Geology of Western Australia', *Geol. Surv. West. Aust. Mem.* No. 2, 1975.

##### Geology of specific areas

GEOLOGICAL SURVEY OF WESTERN AUSTRALIA. *Annual Reports, Bulletins and 4-mile geological maps with explanatory notes*.

COMMONWEALTH BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS. *Bulletins and Records*.

##### Meteorites

RIDE, W. D. L. and NEUMANN, A. (ed.). 'Catalogue of Western Australian meteorite collections'. *Special Publ. W. Aust. Mus.*, No. 3, Perth, 1965.

##### Minerals

SIMPSON, E. S. *Minerals of Western Australia* (3 volumes). Government Printer, Perth, vol. 1, 1948, vol. 2, 1951, vol. 3, 1952.

##### Ore deposits

KNIGHT, C. L. (ed.). 'Economic Geology of Australia and Papua New Guinea — 1. Metals, and 4. Industrial Minerals and Rocks'. *Australas. Inst. Min. Metall. Monograph Series*, No. 5, 1975 and No. 6, 1976.

GEOLOGICAL SURVEY OF WESTERN AUSTRALIA. *Mineral Resources Bulletins*.

PRIDER, R. T. '*Mining in Western Australia*'. University of Western Australia Press (Sesquicentenary Series), Nedlands, 1979.

##### Seismicity

EVERINGHAM, I. B. 'Seismicity of Western Australia'. *Commonw. Bur. Min. Resour. Geol. Geophys. Report* 132, 1968.

## *Chapter II— continued*

### **Part 2 — Climate and Meteorology**

*(Contributed by the Western Australian Regional Office of the Bureau of Meteorology)*

Western Australia is the largest State in the Commonwealth, extending from latitude 13° 30' S to 35° 08' S, and from longitude 113° 09' E to 129° E. It stretches a distance of about 2,400 kilometres in a north-south direction and about 1,600 kilometres west-east. A little more than one-third of the State lies within the tropics, while the remainder extends southward to the temperate zone.

Because of its large size and its latitudinal position, Western Australia has entirely different climates in its northern and southern parts, while in the central regions there is a gradual change from the tropical climate of the north to the typical Mediterranean climate of the south.

Most of the State is a plateau between 300 and 600 metres above mean sea-level and there are no outstanding mountain ranges. Where the edge of the plateau forms the Darling Range along the southern part of the west coast, it exerts a marked influence on the rainfall, causing a rapid increase from the coastal plain to the higher land. Elsewhere the effect of topography is less marked and its main influence is seen in the general decrease of rainfall with increasing distance from the coast.

#### **PRESSURE SYSTEMS**

Weather during the year is controlled largely by the movement of the anticyclonic belt (high pressure systems with anti-clockwise winds) which lies in an east-west direction across the continent for about six months of the year.

In winter this system moves northward, bringing clear skies with fine sunny days and easterly winds to the tropics. With this northward movement, westerly winds on the southern side of the anticyclones extend over the southern part of the State, bringing with them cool cloudy weather and rain. In mid-winter the northern fringe of the 'Roaring Forties' extends to Western Australia and there are frequent westerly gales in the south coastal belt.

These westerly winds are maintained by a series of depressions (low pressure systems with clockwise winds), which move eastward well south of the Western Australian coast, and others which originate in the Indian Ocean and move south-eastward past Cape Leeuwin. The extent to which westerlies affect the State depends largely on the intensity and the position of these depressions.

Towards the end of winter the anticyclonic belt moves southward, and the westerlies are confined more to the lower south-west and the south coastal districts. By summer the anticyclonic belt has moved so far south that its axis is off the south coast and easterly winds prevail over most of the State.

During this summer period the midday sun is at a high elevation in the tropics and the continual heating leads to the development of a monsoonal depression over this region. Wind circulation round this system causes easterlies on its southern or inland side, but in the coastal districts north-east from Onslow, and in parts of the Kimberley, westerlies prevail. Winds in both the north and the south of the State are then in the opposite direction to those prevailing during the winter.

As the sun moves northward again the anticyclonic belt follows it. The monsoonal depression over the tropics dissipates and westerlies again gradually extend northward to the southern part of the State.



During the northern 'Wet' season (from about December to March), occasional cyclones, known locally as 'willy willys', bring strong winds and rain to the tropics. They originate generally in the Timor Sea or off the north-west coast and often move first in a south-westerly direction parallel to the coast and later in a south-easterly direction.

They frequently move inland between Broome and Onslow but occasionally travel further westward before curving to the south-east and moving inland over the west coast. Others fade out at sea without ever crossing the coast. Those that move inland usually commence to dissipate soon after crossing the coast, but occasionally they move right across the State, passing into the Southern Ocean and moving off towards Tasmania.

These storms are often extremely violent and have on occasions almost completely wrecked towns on the north-west coast, while a cyclone which struck a pearling fleet off the Eighty Mile Beach in 1887 caused the loss of twenty-two vessels and 140 lives.

However, despite the damage which they cause, the storms are of great benefit to the pastoral regions on account of the heavy and widespread rain which generally accompanies them. The heaviest fall ever recorded in one day in Western Australia, 747 millimetres, was received at Whim Creek from a cyclone in 1898.

### RAINFALL

The moist rain-bearing winds in this State are in general from a westerly direction. The easterlies, having come from the dry inland parts of Australia, usually bring fine weather and clear skies.

Because of this the highest rainfall occurs in the winter months in the south of the State, and in the summer months in the north. In between these areas there is a gradual change from one rainfall regime to the other.

From the map showing the wettest six-monthly period of the year, it can be seen that the summer rainfall area extends southward from the Kimberley to the Trans-Australia Railway, where there is a rapid change to the winter rainfall regime of the south coast. However, the difference between summer and winter totals decreases southward, and the southern part of this region is one of almost uniform average rainfall.

Proceeding northward from the winter rainfall area of the south-west of the State, the wet period occurs earlier during the year. Across a belt Carnarvon-Menzies-Eucla, there is a more rapid change, and this belt divides the winter rainfall area from that which receives most of its rain in the first six months of the year. Further north, the change is more gradual but continuous and in the Kimberley most of the year's rainfall is received in the summer months which, in the southern parts of the State, are the driest of the year.

The mean annual rainfall for Western Australia is shown on the map later in this Part.

The following table shows the average rainfall and number of wet days, the highest and lowest monthly totals, and the highest daily fall for various centres.

#### RAINFALL AT REPRESENTATIVE CLIMATOLOGICAL STATIONS

*(Stations are arranged from north to south in three groups: Coastal, Wheat Belt and Other Inland)*

Reporting station and characteristic	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
<b>COASTAL</b>													
<i>Wyndham</i> —													
Rainfall — Average (mm)	195	165	120	27	8	5	4	1	2	11	46	108	692
Highest (mm)	717	523	447	515	88	120	133	21	35	85	142	292	1,431
Lowest (mm)	0	14	0	0	0	0	0	0	0	0	1	7	365
Highest one day (mm)	308	150	318	440	69	113	48	19	35	57	90	110	440
Wet days — Average number	13	11	9	3	1	1	0	0	0	2	6	10	56

RAINFALL AT REPRESENTATIVE CLIMATOLOGICAL STATIONS — *continued*

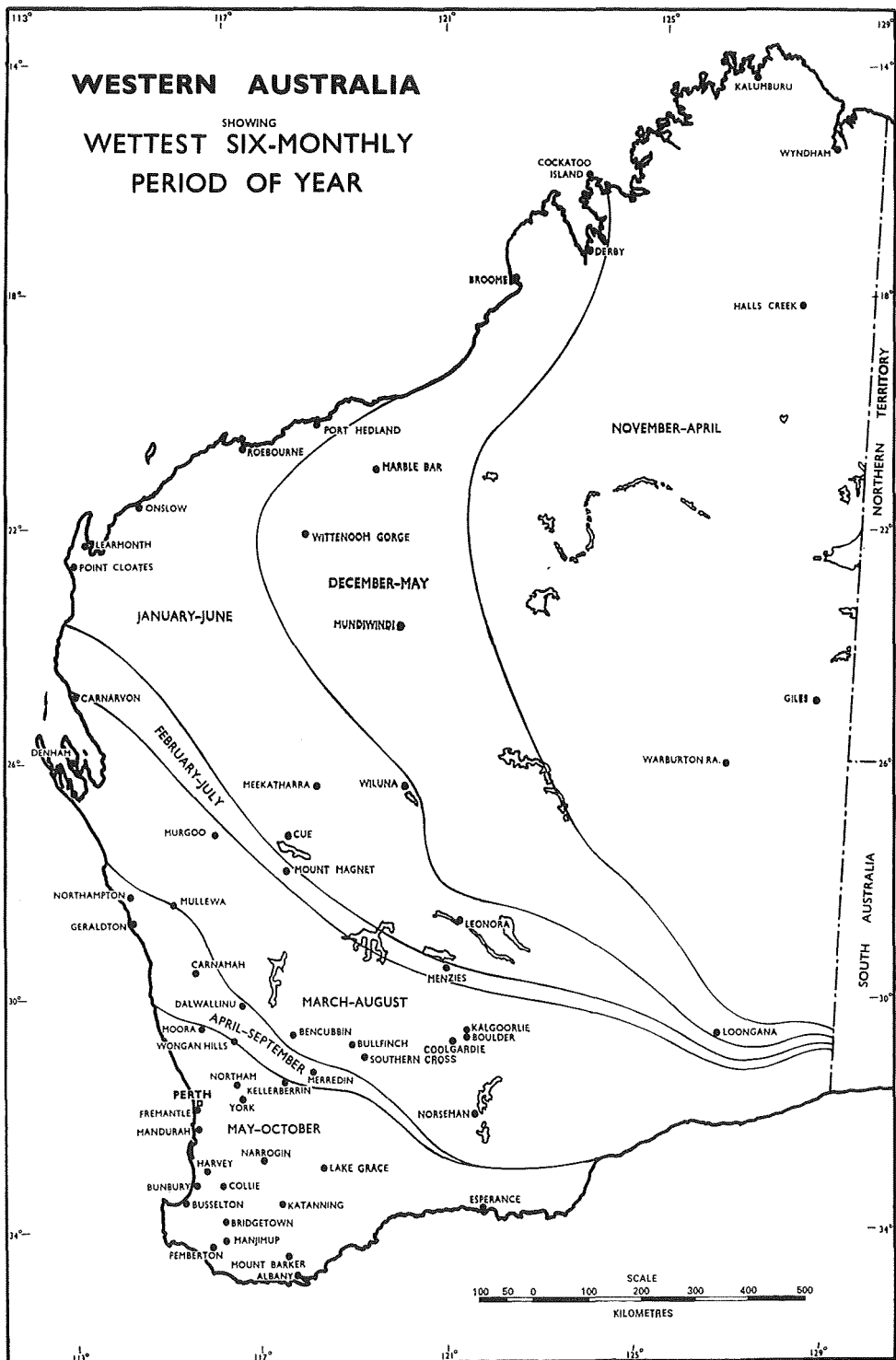
Reporting station and characteristic	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
<i>COASTAL — continued</i>													
<i>Broome —</i>													
Rainfall — Average (mm)	150	158	94	25	36	23	6	1	2	2	8	32	537
Highest (mm)	825	427	439	226	176	208	72	23	24	28	50	279	1,228
Lowest (mm)	7	8	1	0	0	0	0	0	0	0	0	0	139
Highest one day (mm)	351	140	204	107	119	127	55	9	13	15	37	210	351
Wet days — Average number	11	10	8	3	3	2	2	1	1	1	1	4	47
<i>Port Hedland —</i>													
Rainfall — Average (mm)	61	91	36	24	31	20	9	4	1	1	3	23	304
Highest (mm)	454	360	251	352	170	125	81	35	4	8	67	219	627
Lowest (mm)	0	0	0	0	0	0	0	0	0	0	0	0	47
Highest one day (mm)	387	329	152	111	156	53	46	22	3	7	59	169	387
Wet days — Average number	5	7	4	2	4	3	2	1	1	1	1	2	33
<i>Roebourne —</i>													
Rainfall — Average (mm)	66	63	67	32	29	31	14	5	1	1	2	10	321
Highest (mm)	368	325	408	552	225	309	135	98	40	31	31	129	1,060
Lowest (mm)	0	0	0	0	0	0	0	0	0	0	0	0	3
Highest one day (mm)	213	169	234	146	168	134	57	44	23	29	17	97	234
Wet days — Average number	3	4	4	1	3	3	2	1	0	0	0	1	22
<i>Onslow —</i>													
Rainfall — Average (mm)	25	46	51	21	44	43	19	9	1	1	2	3	265
Highest (mm)	261	539	415	279	259	183	222	107	25	27	56	61	999
Lowest (mm)	0	0	0	0	0	0	0	0	0	0	0	0	15
Highest one day (mm)	158	356	283	157	117	111	76	62	17	21	30	38	356
Wet days — Average number	2	3	3	2	4	4	2	2	0	0	0	1	23
<i>Carnarvon —</i>													
Rainfall — Average (mm)	19	25	16	12	42	50	51	18	4	6	4	1	248
Highest (mm)	157	149	93	89	195	161	180	51	19	38	81	4	556
Lowest (mm)	0	0	0	0	0	1	0	0	0	0	0	0	75
Highest one day (mm)	52	78	77	76	95	96	82	35	11	15	7	4	96
Wet days — Average number	2	3	2	3	6	8	8	5	3	3	1	1	45
<i>Geraldton —</i>													
Rainfall — Average (mm)	7	12	14	27	76	116	101	66	30	19	8	6	482
Highest (mm)	53	131	89	100	282	286	243	131	81	109	47	59	843
Lowest (mm)	0	0	0	1	0	34	32	11	0	0	0	0	220
Highest one day (mm)	36	69	88	48	62	109	72	59	39	71	17	51	109
Wet days — Average number	2	2	3	7	10	15	15	13	9	7	4	2	89
<i>Perth — Bureau —</i>													
Rainfall — Average (mm)	8	12	20	45	124	183	174	137	80	55	21	14	873
Highest (mm)	55	166	145	149	308	476	425	318	199	200	71	81	1,338
Lowest (mm)	0	0	0	0	14	55	61	12	9	1	0	0	508
Highest one day (mm)	44	87	77	67	76	99	76	74	47	50	39	47	99
Wet days — Average number	3	3	4	7	14	17	18	17	14	11	6	4	118
<i>Bunbury —</i>													
Rainfall — Average (mm)	10	11	23	46	131	185	175	126	81	55	25	14	882
Highest (mm)	86	103	91	175	288	412	417	302	201	195	84	80	1,365
Lowest (mm)	0	0	0	0	10	73	49	21	0	5	0	0	484
Highest one day (mm)	66	86	66	61	79	82	95	62	58	39	38	27	95
Wet days — Average number	3	3	4	8	14	18	20	18	14	11	7	4	124
<i>Albany —</i>													
Rainfall — Average (mm)	18	21	29	73	97	95	132	103	78	86	45	32	809
Highest (mm)	68	62	85	127	192	224	204	174	133	172	117	97	966
Lowest (mm)	3	4	7	41	54	45	55	52	43	38	6	5	628
Highest one day (mm)	43	36	33	52	40	38	43	44	44	53	28	19	53
Wet days — Average number	9	8	11	16	17	19	23	21	19	16	11	9	179
<i>Esperance — Post Office —</i>													
Rainfall — Average (mm)	18	20	28	45	82	101	107	97	71	55	28	23	675
Highest (mm)	133	120	125	176	179	274	240	211	174	146	145	81	1,003
Lowest (mm)	0	0	0	2	20	28	24	19	11	13	0	0	438
Highest one day (mm)	60	37	42	126	52	106	55	48	116	43	51	44	126
Wet days — Average number	5	5	7	10	15	16	17	16	13	12	7	6	129

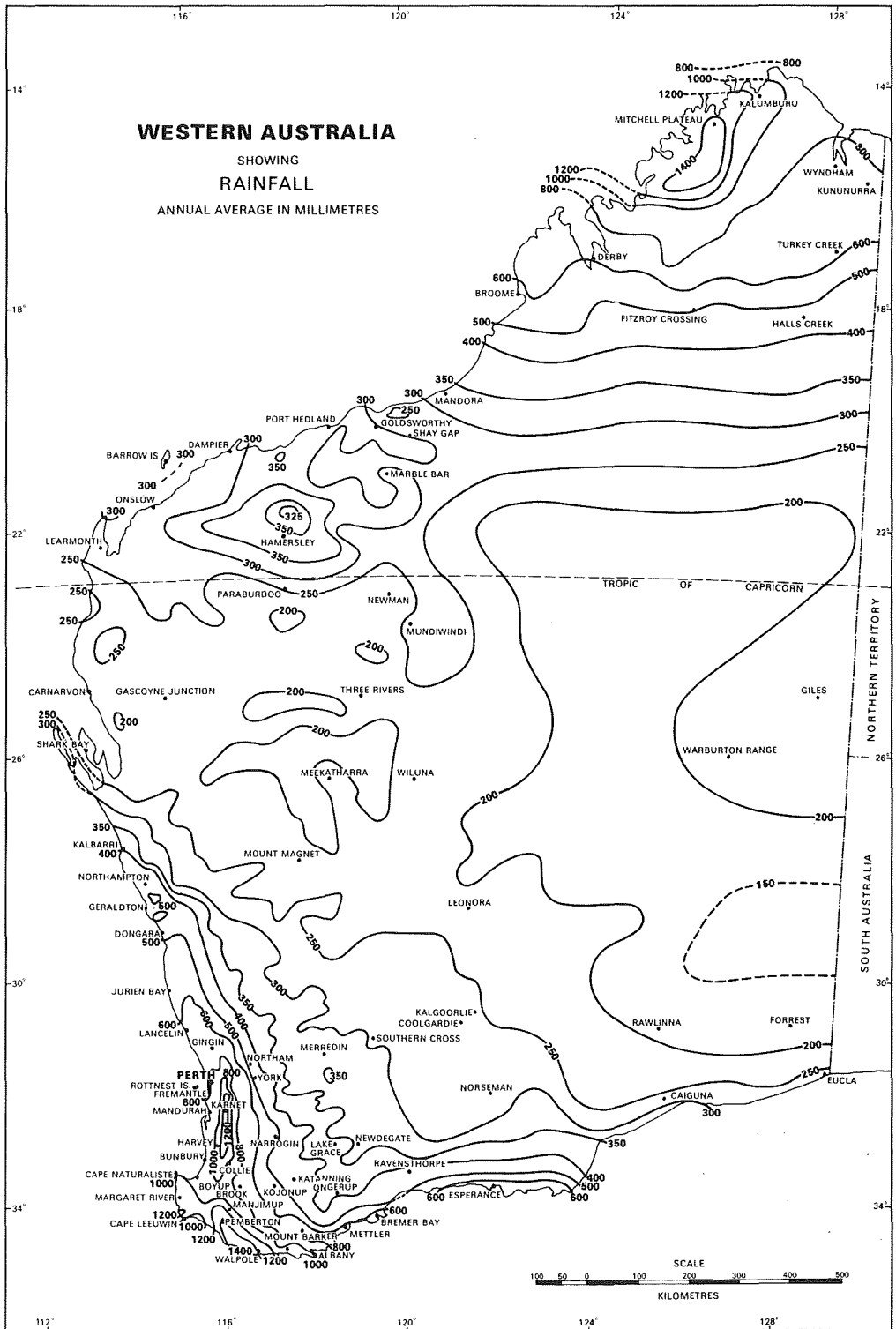
RAINFALL AT REPRESENTATIVE CLIMATOLOGICAL STATIONS — *continued*

Reporting station and characteristic	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
<i>COASTAL — continued</i>													
<i>Eucla</i> —													
Rainfall — Average (mm)	15	16	21	27	32	27	23	24	19	18	17	13	252
Highest (mm)	95	182	127	205	104	155	62	82	85	74	67	116	453
Lowest (mm)	0	0	0	0	0	3	0	3	1	1	0	0	52
Highest one day (mm)	54	115	51	41	75	36	26	31	40	33	28	49	115
Wet days — Average number	3	4	5	7	9	10	10	9	7	6	5	4	79
<i>WHEAT BELT</i>													
<i>Carnamah</i> —													
Rainfall — Average (mm)	11	14	23	23	52	83	72	54	29	18	10	8	397
Highest (mm)	103	103	180	121	170	231	188	192	84	73	91	56	782
Lowest (mm)	0	0	0	0	2	21	14	12	1	0	0	0	204
Highest one day (mm)	97	78	153	89	74	61	43	79	33	40	71	50	153
Wet days — Average number	2	2	3	6	8	13	14	11	8	6	3	2	78
<i>Wongan Hills</i> —													
Rainfall — Average (mm)	11	15	22	24	55	81	72	52	27	20	10	8	397
Highest (mm)	70	111	166	81	188	220	174	131	97	66	43	59	675
Lowest (mm)	0	0	0	0	0	17	8	8	2	0	0	0	161
Highest one day (mm)	69	80	81	62	64	70	41	34	37	36	32	57	81
Wet days — Average number	2	2	3	5	8	12	13	11	7	6	3	2	74
<i>Kellerberrin</i> —													
Rainfall — Average (mm)	11	13	23	22	44	59	55	42	27	19	11	13	339
Highest (mm)	87	127	152	110	119	163	123	100	76	77	68	67	661
Lowest (mm)	0	0	0	0	0	15	11	3	2	0	0	0	172
Highest one day (mm)	52	108	103	58	40	53	38	40	24	37	33	57	108
Wet days — Average number	2	2	4	5	8	12	13	11	8	6	3	2	76
<i>Southern Cross</i> —													
Rainfall — Average (mm)	14	19	23	22	33	41	39	30	19	16	14	11	281
Highest (mm)	113	137	169	128	119	183	107	88	106	79	75	72	577
Lowest (mm)	0	0	0	0	0	5	11	1	0	0	0	0	118
Highest one day (mm)	63	84	61	44	55	43	36	31	25	55	51	40	84
Wet days — Average number	3	3	4	5	8	10	11	9	6	5	3	2	69
<i>Merredin</i> —													
Rainfall — Average (mm)	11	12	23	23	42	55	55	39	25	20	13	13	331
Highest (mm)	77	80	161	114	132	135	127	86	86	75	69	93	565
Lowest (mm)	0	0	0	0	1	6	9	1	0	0	0	0	130
Highest one day (mm)	66	66	83	60	49	59	45	34	45	30	37	49	83
Wet days — Average number	2	2	4	5	8	11	13	10	7	5	3	2	72
<i>Northam</i> —													
Rainfall — Average (mm)	8	12	20	23	57	86	86	62	37	25	10	9	435
Highest (mm)	56	190	189	88	148	233	221	170	129	100	41	66	711
Lowest (mm)	0	0	0	0	1	10	20	3	3	0	0	0	194
Highest one day (mm)	41	116	126	75	65	57	51	33	31	58	32	50	126
Wet days — Average number	2	2	3	6	10	15	16	14	11	8	4	2	93
<i>Wandering</i> —													
Rainfall — Average (mm)	9	13	22	35	82	122	119	94	63	45	18	14	636
Highest (mm)	56	244	122	121	195	368	324	270	192	129	65	106	1,051
Lowest (mm)	0	0	0	0	11	25	34	14	8	1	0	0	297
Highest one day (mm)	49	138	104	51	61	85	69	53	40	43	48	64	138
Wet days — Average number	3	3	5	7	13	16	18	16	14	11	6	4	116
<i>Narrogin</i> —													
Rainfall — Average (mm)	9	16	22	30	67	93	92	69	48	34	16	13	509
Highest (mm)	69	237	128	121	167	300	243	185	121	123	77	95	741
Lowest (mm)	0	0	0	0	10	25	25	16	7	2	0	0	269
Highest one day (mm)	50	115	114	63	68	71	81	42	36	38	38	50	115
Wet days — Average number	2	3	4	6	11	14	16	13	11	8	5	2	95
<i>Katanning</i> —													
Rainfall — Average (mm)	11	16	24	32	63	82	79	63	47	38	20	16	491
Highest (mm)	87	225	134	162	148	214	174	173	123	115	98	74	782
Lowest (mm)	0	0	0	1	7	21	22	13	4	5	0	0	273
Highest one day (mm)	64	126	70	106	59	70	38	44	37	50	55	55	126
Wet days — Average number	3	4	4	7	13	16	18	16	13	11	6	4	115

RAINFALL AT REPRESENTATIVE CLIMATOLOGICAL STATIONS — *continued*

Reporting station and characteristic	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
<b>OTHER INLAND</b>													
<i>Halls Creek</i> —													
Rainfall — Average (mm)	144	121	54	24	13	4	6	3	5	16	32	67	489
Highest (mm)	501	369	163	162	105	87	69	49	85	87	175	208	791
Lowest (mm)	14	3	2	0	0	0	0	0	0	0	1	4	250
Highest one day (mm)	202	124	95	88	30	36	48	42	37	30	97	120	202
Wet days — Average number	13	11	8	3	2	1	1	1	1	3	6	10	60
<i>Marble Bar</i> —													
Rainfall — Average (mm)	71	74	51	20	24	25	12	5	1	4	9	37	333
Highest (mm)	310	235	389	241	187	165	134	35	14	116	62	243	742
Lowest (mm)	0	0	0	0	0	0	0	0	0	0	0	0	72
Highest one day (mm)	146	121	305	125	91	105	63	32	24	84	61	150	305
Wet days — Average number	7	7	4	2	2	2	2	1	0	1	2	4	34
<i>Mundiwindi</i> —													
Rainfall — Average (mm)	44	44	46	22	21	22	9	7	3	7	11	26	262
Highest (mm)	321	325	267	180	121	205	70	53	61	93	71	160	816
Lowest (mm)	0	0	0	0	0	0	0	0	0	0	0	0	26
Highest one day (mm)	133	71	175	80	56	123	43	39	34	53	58	114	175
Wet days — Average number	6	5	5	3	3	3	2	2	1	1	3	4	38
<i>Warburton Range</i> —													
Rainfall — Average (mm)	24	27	22	22	20	20	11	11	4	11	17	24	213
Highest (mm)	177	149	181	111	91	99	54	72	25	102	83	95	691
Lowest (mm)	0	0	0	0	0	0	0	0	0	0	0	0	35
Highest one day (mm)	58	78	101	77	66	42	22	50	24	45	47	61	101
Wet days — Average number	3	3	3	3	4	3	2	2	1	2	3	4	33
<i>Meekatharra</i> —													
Rainfall — Average (mm)	31	29	27	17	24	37	25	12	4	5	11	7	229
Highest (mm)	129	142	166	65	72	156	166	56	21	18	94	25	420
Lowest (mm)	0	0	0	0	0	0	0	0	0	0	0	0	66
Highest one day (mm)	103	57	54	37	37	61	62	23	13	25	82	24	103
Wet days — Average number	5	4	4	4	5	7	6	3	2	1	2	3	46
<i>Laverton</i> —													
Rainfall — Average (mm)	22	22	32	21	23	23	14	13	6	7	14	15	212
Highest (mm)	142	144	122	205	124	126	66	85	67	50	152	152	452
Lowest (mm)	0	0	0	0	0	0	0	0	0	0	0	0	66
Highest one day (mm)	75	87	67	54	52	40	21	41	44	49	91	71	91
Wet days — Average number	3	3	4	3	5	5	4	3	2	2	3	3	40
<i>Kalgoorlie</i> —													
Rainfall — Average (mm)	23	32	23	23	26	33	27	20	15	14	15	12	263
Highest (mm)	186	308	143	99	110	186	83	65	98	70	70	41	488
Lowest (mm)	0	0	0	0	0	2	5	4	0	0	0	0	108
Highest one day (mm)	154	178	70	70	45	57	28	40	44	26	65	25	178
Wet days — Average number	3	4	4	6	7	9	9	7	6	4	4	3	66
<i>Rawlinna</i> —													
Rainfall — Average (mm)	14	16	19	19	19	19	14	16	12	14	13	13	188
Highest (mm)	210	123	85	114	81	131	58	155	85	64	81	117	497
Lowest (mm)	0	0	0	0	0	0	0	0	0	0	0	0	79
Highest one day (mm)	100	73	48	58	31	38	25	66	72	31	65	49	100
Wet days — Average number	2	3	3	3	5	5	5	4	4	3	3	3	43
<i>Collie</i> —													
Rainfall — Average (mm)	13	14	25	50	133	193	191	147	103	71	29	16	985
Highest (mm)	85	178	105	183	270	474	440	414	249	213	90	81	1,467
Lowest (mm)	0	0	0	4	15	58	52	31	15	2	1	0	605
Highest one day (mm)	74	106	84	63	62	91	69	73	58	49	36	32	106
Wet days — Average number	4	3	5	10	17	20	22	20	17	14	8	5	145
<i>Manjimup</i> —													
Rainfall — Average (mm)	19	19	33	65	139	183	185	150	109	81	45	25	1,053
Highest (mm)	92	117	138	194	269	332	320	323	257	165	122	78	1,761
Lowest (mm)	0	0	1	9	26	86	43	49	24	9	3	0	650
Highest one day (mm)	79	44	89	77	79	83	50	54	59	53	49	32	89
Wet days — Average number	5	5	7	11	17	20	21	20	16	14	10	7	153





RAINFALL AT REPRESENTATIVE CLIMATOLOGICAL STATIONS — *continued*

Reporting station and characteristic	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
<b>OTHER INLAND — <i>continued</i></b>													
<i>Pemberton —</i>													
Rainfall — Average (mm)	21	18	40	87	159	209	234	169	119	94	57	38	1,245
Highest (mm)	80	86	128	213	337	365	391	388	214	189	158	92	1,712
Lowest (mm)	1	1	5	10	36	118	130	84	45	13	6	3	802
Highest one day (mm)	60	30	77	53	77	59	68	51	45	44	45	42	77
Wet days — Average number	7	6	8	12	18	20	23	20	18	16	12	9	169
<i>Mount Barker —</i>													
Rainfall — Average (mm)	22	24	37	57	86	100	108	94	82	74	42	30	756
Highest (mm)	179	179	129	234	243	209	261	173	157	160	155	87	1,095
Lowest (mm)	1	1	4	4	16	43	22	33	18	16	3	1	431
Highest one day (mm)	105	72	57	139	69	68	72	48	45	54	64	44	139
Wet days — Average number	8	7	10	13	17	19	21	20	18	16	11	10	170

ANNUAL RAINFALL AT REPRESENTATIVE STATIONS  
(Millimetres)

Station	1975	1976	1977	1978	1979	1980	Long-term average (a)
Albany (Meteorology Office)	800	966	796	961	812	728	809
Broome	500	945	298	1,216	339	745	537
Bunbury	667	857	653	800	608	831	882
Carnamah	491	221	251	487	204	(b)	397
Carnarvon	485	139	174	188	87	323	248
Collie	788	764	751	790	637	(b)	985
Esperance (Meteorology Office)	687	637	520	561	706	564	675
Eucia	(b)	(b)	274	378	254	275	252
Geraldton	479	281	320	560	431	366	482
Halls Creek	835	496	632	538	357	769	489
Kalgoorlie	420	129	154	211	187	321	263
Katanning	437	480	406	382	340	471	491
Kellerberrin	276	286	209	292	263	196	339
Laverton	(b)	(b)	(b)	(b)	(b)	(b)	212
Manjimup	946	1,022	898	1,053	894	924	1,053
Marble Bar	379	345	338	467	393	798	333
Meekatharra	442	139	70	170	114	302	229
Merredin	337	310	216	462	305	212	331
Mount Barker	735	745	701	767	771	676	756
Mundiwindi	(b)	185	136	(b)	213	(b)	262
Narrogin	484	468	448	550	375	537	509
Northam	466	437	323	372	(b)	291	435
Onslow (Post Office)	(b)	209	181	179	126	537	265
Pemberton	1,120	1,124	1,008	1,168	1,011	1,115	1,245
Perth (Bureau of Meteorology)	682	711	608	923	560	847	873
Port Hedland	393	258	322	411	178	479	304
Rawlinna	231	118	77	259	150	196	188
Roebourne	280	291	196	316	116	357	321
Southern Cross	336	201	238	381	200	246	281
Wandering	556	571	480	563	406	612	636
Warburton Range	(b)	(b)	(b)	351	(b)	(b)	213
Wongan Hills	423	387	261	354	293	265	397
Wyndham	822	607	846	674	(b)	922	692

(a) Number of years of record used to calculate the long-term average varies from station to station.

(b) Records incomplete.

## TEMPERATURE

The hottest month in Western Australia is November in the Kimberley, December a little further south and January near the Tropic of Capricorn. In the tropics temperatures generally rise from July, the coldest month, to November. In some places further rises occur, but in others the onset of the 'Wet' prevents this further rise and there is a slight fall. As the rains cease at these latter places temperatures commence to rise again and there is another minor peak in March or April. After this there is a general fall until July.

South of the tropics the hottest month is January, except in coastal districts where February is hotter. The coldest month is again July.

The most consistently hot place in the State is Wyndham, where the mean maximum throughout the year is 34.6°C and the mean minimum for the coldest month is 18.9°C. At Marble Bar the yearly mean maximum of 35.4°C is higher, but mean minimum temperatures are consistently lower, falling to 11.4°C in the coldest month. The mean maximum at this centre is the highest in Australia, exceeding 37.8°C in the five months from November to March inclusive. There are often long spells of hot weather in this region and during one period, from 31 October 1923 to 7 April 1924, the maximum temperature at Marble Bar reached or exceeded 37.8°C on 160 consecutive days.

Further south temperatures are lower, but even in the southern parts of the State there are occasional heat waves, and the highest temperature on record, 50.7°C, was recorded at Eucla on the south coast.

Near the coast the sea breeze generally brings relief from high temperatures. It blows nearly every afternoon in the hot months, and is known in Perth as the 'Fremantle Doctor'. Away from the influence of the sea, extremes are greater, day temperatures being higher and night temperatures lower than in the coastal districts. During the winter, temperatures have fallen below  $-1.1^{\circ}\text{C}$  in most of the inland part of the State south from the tropics. The lowest on record is  $-7.0^{\circ}\text{C}$  which occurred at Dwellingup (26 June 1973), and as far north as Mundiwindi, almost in the tropics,  $-5.3^{\circ}\text{C}$  has been recorded.

Frosts are at times widespread over the southern part of the State and occasionally extend into the tropics, but they are not particularly troublesome as they normally occur during that period of the year when crops are least susceptible to frost damage. They occur mainly in the months May to September inclusive and are most frequent in July and August.

The table below shows, for each month of the year, the mean maximum, mean minimum, and extreme temperatures and the average number of days with registrations of 30.0°C and over and of 40.0°C and over. The average number of days with temperatures of 2.0°C or below, which provides an indication of frost frequency, is also shown.

### TEMPERATURES AT REPRESENTATIVE CLIMATOLOGICAL STATIONS

(Stations are arranged from north to south in three groups: Coastal, Wheat Belt and Other Inland)

[illegible]



TEMPERATURES AT REPRESENTATIVE CLIMATOLOGICAL STATIONS — *continued*

Reporting station and characteristic	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
<b>COASTAL — <i>continued</i></b>													
<i>Roebourne —</i>													
Temperature:													
Mean max., °C	38.3	37.7	37.2	34.8	30.0	26.6	26.2	28.5	32.2	34.9	37.8	38.8	33.6
Mean min., °C	26.1	26.0	25.1	21.8	18.1	14.9	13.2	14.2	16.5	19.2	22.6	24.6	20.2
Highest max., °C	47.8	47.6	45.2	43.4	37.8	34.3	33.3	36.1	41.6	45.0	47.4	47.6	47.8
Lowest min., °C	18.6	12.8	17.2	14.1	8.2	4.4	4.4	1.8	7.8	11.1	9.4	11.7	1.8
No. of days 30.0°C and over	30.3	27.4	30.3	28.9	18.6	4.8	3.2	10.3	24.4	28.3	29.5	30.8	268.5
No. of days 40.0°C and over	12.3	8.8	8.1	1.4	0.0	0.0	0.0	0.0	*	3.5	10.2	12.8	56.8
No. of days 2.0°C and under	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.	0.0	0.0	0.0	0.0	0.0
<i>Onslow —</i>													
Temperature:													
Mean max., °C	35.9	35.8	35.4	33.3	28.7	25.3	24.7	26.4	29.2	31.7	34.1	35.4	31.3
Mean min., °C	23.3	23.8	22.8	19.7	15.6	12.6	11.0	11.8	13.7	16.1	18.9	21.2	17.6
Highest max., °C	47.7	48.3	46.4	43.8	38.3	32.2	32.3	35.3	38.3	44.6	46.1	47.5	48.3
Lowest min., °C	15.8	16.6	14.7	10.0	5.6	2.9	3.1	4.4	5.5	7.4	10.0	9.4	2.9
No. of days 30.0°C and over	30.0	27.4	28.2	26.6	10.6	0.8	0.3	3.2	13.1	22.6	25.6	29.0	217.8
No. of days 40.0°C and over	6.1	5.3	4.1	0.5	0.0	0.0	0.0	0.0	0.0	0.8	2.9	5.5	25.1
No. of days 2.0°C and under	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Carnarvon —</i>													
Temperature:													
Mean max., °C	30.8	32.0	30.1	28.1	25.9	23.1	21.9	22.4	23.8	25.6	27.0	28.9	26.7
Mean min., °C	22.6	23.1	21.9	18.7	14.9	13.0	11.0	11.3	13.8	16.4	18.7	20.8	17.2
Highest max., °C	47.7	46.6	45.3	41.1	36.2	31.8	30.3	31.2	38.4	42.4	43.4	45.4	47.7
Lowest min., °C	16.8	17.2	13.4	9.5	6.1	3.6	3.4	3.5	7.8	8.8	10.7	12.6	3.4
No. of days 30.0°C and over	15.1	16.9	14.9	8.4	2.8	0.1	0.0	0.3	1.8	3.7	4.5	9.4	76.6
No. of days 40.0°C and over	1.8	2.3	1.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.8	6.0
No. of days 2.0°C and under	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Geraldton —</i>													
Temperature:													
Mean max., °C	31.6	32.2	30.6	26.7	24.0	20.6	19.4	19.8	21.6	24.5	27.1	29.9	25.7
Mean min., °C	18.7	19.1	17.5	14.9	12.6	11.2	9.2	8.7	8.8	10.9	13.7	16.7	13.5
Highest max., °C	47.7	44.8	44.3	39.4	36.6	28.5	28.8	31.6	35.5	40.7	42.2	46.7	47.7
Lowest min., °C	10.2	10.0	8.9	6.9	2.1	0.5	1.1	1.3	1.8	3.1	3.8	7.7	0.5
No. of days 30.0°C and over	15.1	16.6	14.6	6.7	1.1	0.0	0.0	0.1	0.7	3.0	7.0	11.2	75.8
No. of days 40.0°C and over	3.3	2.5	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.3	8.3
No. of days 2.0°C and under	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	*	0.0	0.0	0.0	0.4
<i>Perth —</i>													
Temperature:													
Mean max., °C	29.6	29.9	27.8	24.5	20.7	18.2	17.3	17.9	19.4	21.2	24.6	27.3	23.2
Mean min., °C	17.7	17.9	16.6	14.1	11.6	9.9	9.0	9.1	10.1	11.5	14.0	16.2	13.1
Highest max., °C	44.7	44.6	41.3	37.6	32.4	28.1	26.3	27.8	32.7	37.3	40.3	42.3	44.7
Lowest min., °C	9.2	8.7	7.7	4.1	1.3	1.6	1.2	1.9	2.6	4.2	5.6	8.6	1.2
No. of days 30.0°C and over	14.8	14.6	9.9	2.6	0.1	0.0	0.0	0.0	0.1	1.3	4.2	8.9	55.0
No. of days 40.0°C and over	1.0	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.8
No. of days 2.0°C and under	0.0	0.0	0.0	0.0	*	0.1	*	0.0	0.0	0.0	0.0	0.0	0.1
<i>Bunbury —</i>													
Temperature:													
Mean max., °C	27.5	27.6	25.8	22.9	19.8	17.6	16.8	17.1	18.2	19.9	23.0	25.6	21.8
Mean min., °C	14.8	15.1	14.1	12.0	10.2	9.1	8.2	8.3	9.2	10.1	12.1	13.7	11.4
Highest max., °C	41.2	40.1	38.3	33.9	28.7	25.1	22.3	24.2	28.8	33.6	37.7	38.6	41.2
Lowest min., °C	5.6	5.2	4.1	2.6	0.1	0.6	-2.2	0.6	-1.1	0.6	4.0	3.6	-2.2
No. of days 30.0°C and over	9.0	9.3	4.2	0.4	0.0	0.0	0.0	0.0	0.0	0.2	1.2	4.8	29.7
No. of days 40.0°C and over	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
No. of days 2.0°C and under	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.3
<i>Albany —</i>													
Temperature:													
Mean max., °C	25.8	25.4	24.2	21.0	18.5	16.3	15.7	15.5	16.7	18.8	21.1	23.9	20.2
Mean min., °C	13.3	13.9	12.9	11.6	9.5	8.1	7.4	6.8	7.4	9.0	10.4	12.4	10.2
Highest max., °C	45.6	41.6	40.5	38.8	32.6	23.6	22.5	22.0	26.8	31.7	41.1	41.1	45.6
Lowest min., °C	5.6	5.1	5.0	5.2	2.9	0.0	1.1	1.4	1.4	2.3	2.9	3.7	0.0
No. of days 30.0°C and over	4.2	4.4	4.0	0.8	0.1	0.0	0.0	0.0	0.0	0.1	1.1	2.7	15.9
No. of days 40.0°C and over	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6
No. of days 2.0°C and under	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.4	0.3	0.0	0.0	0.0	1.2
<i>Esperance — Post Office —</i>													
Temperature:													
Mean max., °C	25.9	25.2	24.8	22.9	20.1	18.5	17.0	17.2	18.8	20.7	22.5	23.5	21.4
Mean min., °C	15.9	16.4	14.9	13.1	10.1	9.1	7.9	7.2	8.7	10.6	12.6	14.4	11.7
Highest max., °C	47.2	44.3	43.6	38.9	33.1	27.2	26.0	31.5	35.6	39.9	42.2	44.4	47.2
Lowest min., °C	4.9	4.9	3.9	3.3	1.7	0.0	-0.6	0.0	1.3	1.0	3.3	4.4	-0.6
No. of days 30.0°C and over	5.7	4.3	4.7	2.7	0.5	0.0	0.0	0.0	0.4	2.4	3.0	3.0	27.6
No. of days 40.0°C and over	1.5	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.2	2.9
No. of days 2.0°C and under	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.4	0.0	0.0	0.0	0.0	0.6

TEMPERATURES AT REPRESENTATIVE CLIMATOLOGICAL STATIONS — *continued*

Reporting station and characteristic	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
<b>COASTAL — <i>continued</i></b>													
<i>Eucla</i> —													
Temperature:													
Mean max., °C	24.9	24.6	24.7	22.9	20.9	18.7	17.8	18.8	20.6	21.8	22.7	23.8	21.8
Mean min., °C	16.5	16.7	16.1	13.4	10.2	8.2	6.9	7.5	8.9	10.9	13.2	15.1	11.9
Highest max., °C	50.7	48.9	44.4	41.4	35.8	33.3	32.1	34.9	40.0	43.1	46.7	49.3	50.7
Lowest min., °C	7.2	6.6	4.6	—0.2	0.6	—2.2	—2.2	—1.6	—0.6	—0.3	2.8	3.3	—2.2
No. of days 30.0°C and over	6.0	4.7	5.2	4.2	0.7	0.2	0.0	0.3	2.4	5.7	5.7	6.1	42.6
No. of days 40.0°C and over	2.1	1.1	0.8	0.7	0.0	0.0	0.0	0.0	0.1	0.4	0.5	1.2	6.1
No. of days 2.0°C and under	0.0	0.0	0.0	0.1	0.0	0.3	0.5	0.6	0.2	0.0	0.0	0.0	1.5
<i>WHEAT BELT</i>													
<i>Carnamah</i> —													
Temperature:													
Mean max., °C	36.0	35.3	32.7	27.4	22.6	19.1	17.7	19.3	22.2	25.6	29.8	33.1	26.7
Mean min., °C	18.2	18.5	16.6	13.3	10.3	8.6	7.0	6.9	7.8	9.8	12.7	15.4	12.1
Highest max., °C	48.1	45.6	43.9	40.0	34.4	27.8	27.8	29.4	35.1	40.0	43.1	44.1	48.1
Lowest min., °C	5.1	6.9	6.7	1.7	1.1	0.0	0.6	0.7	1.0	1.1	2.3	6.7	0.0
No. of days 30.0°C and over	27.7	24.8	21.2	8.5	0.7	0.0	0.0	0.0	0.5	6.3	14.9	25.9	132.0
No. of days 40.0°C and over	4.7	6.8	1.9	*	0.0	0.0	0.0	0.0	0.0	0.0	0.6	3.7	17.9
No. of days 2.0°C and under	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.3	0.0	0.0	0.0	0.9
<i>Wongan Hills</i> —													
Temperature:													
Mean max., °C	34.0	33.9	30.1	25.3	21.3	17.6	16.9	17.2	19.9	24.9	29.1	32.5	25.2
Mean min., °C	17.6	17.6	15.4	12.4	9.1	7.7	6.2	5.8	6.7	9.9	12.9	15.6	11.4
Highest max., °C	47.4	44.4	42.5	39.2	34.7	26.0	25.4	27.2	35.2	38.8	41.8	44.2	47.4
Lowest min., °C	8.8	9.5	5.6	2.8	—0.6	0.5	—0.9	—0.5	0.6	1.7	4.3	5.3	—0.9
No. of days 30.0°C and over	25.1	22.1	16.3	6.3	0.5	0.0	0.0	0.0	0.3	4.8	11.1	21.7	107.6
No. of days 40.0°C and over	3.5	3.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.8	9.5
No. of days 2.0°C and under	0.0	0.0	0.0	0.0	0.5	0.7	1.2	3.1	0.5	0.2	0.0	0.0	6.4
<i>Kellerberrin</i> —													
Temperature:													
Mean max., °C	33.9	33.2	30.2	25.5	20.5	17.3	16.2	17.6	20.8	24.4	28.9	31.9	25.1
Mean min., °C	16.8	16.7	15.1	11.7	8.4	7.0	5.7	5.6	6.6	8.8	12.3	14.9	10.8
Highest max., °C	46.1	46.7	44.4	39.2	35.6	26.9	24.4	28.3	36.5	39.4	43.1	45.0	46.7
Lowest min., °C	7.2	6.1	4.8	1.1	—2.2	—3.1	—3.3	—2.4	—1.1	0.3	1.7	5.6	—3.3
No. of days 30.0°C and over	24.9	20.8	15.3	4.7	0.3	0.0	0.0	0.0	0.4	4.9	11.5	20.3	102.5
No. of days 40.0°C and over	3.5	1.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.2	7.3
No. of days 2.0°C and under	0.0	0.0	0.0	*	1.0	1.8	3.1	4.6	2.1	0.1	*	0.0	12.9
<i>Southern Cross</i> —													
Temperature:													
Mean max., °C	34.7	33.8	30.7	25.7	20.6	17.1	16.3	18.2	22.1	25.6	30.1	33.2	25.7
Mean min., °C	17.1	16.9	14.9	11.1	7.4	5.6	4.2	4.6	6.3	9.0	12.7	15.3	10.4
Highest max., °C	46.1	47.2	44.4	39.6	33.3	27.5	26.7	30.6	34.8	39.3	43.4	45.9	47.2
Lowest min., °C	5.6	5.6	3.4	—1.1	—3.3	—4.3	—5.0	—3.9	—3.3	—0.8	2.0	4.9	—5.0
No. of days 30.0°C and over	26.6	22.7	17.2	6.0	0.5	0.0	0.0	0.1	0.6	6.6	13.6	23.8	117.8
No. of days 40.0°C and over	5.0	2.5	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.9	10.8
No. of days 2.0°C and under	0.0	0.0	0.0	0.2	1.9	4.1	7.7	8.0	3.5	0.9	*	0.0	26.3
<i>Merredin</i> —													
Temperature:													
Mean max., °C	33.6	32.9	29.8	25.0	19.7	16.7	15.6	17.0	20.6	24.1	28.6	31.7	24.6
Mean min., °C	16.8	16.7	15.1	11.6	7.9	6.3	4.7	4.6	5.8	8.4	12.2	14.9	10.4
Highest max., °C	46.0	44.5	39.6	36.2	33.4	24.6	25.1	26.9	34.4	38.4	41.6	42.8	46.0
Lowest min., °C	10.6	8.9	5.4	2.5	—1.4	—2.1	—1.7	—2.8	—1.8	—0.3	0.6	3.3	—2.8
No. of days 30.0°C and over	24.4	21.0	15.5	4.5	0.2	0.0	0.0	0.0	0.4	3.6	10.8	20.7	99.9
No. of days 40.0°C and over	2.5	2.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.3	7.0
No. of days 2.0°C and under	0.0	0.0	0.0	0.0	1.1	2.4	4.4	6.9	3.8	0.5	0.1	0.0	19.8
<i>Northam</i> —													
Temperature:													
Mean max., °C	33.9	33.5	30.6	26.1	20.7	17.6	16.6	17.8	20.5	23.5	28.4	31.9	25.1
Mean min., °C	17.0	16.9	15.3	11.8	8.4	6.4	5.4	5.7	7.1	8.9	12.4	15.3	10.9
Highest max., °C	46.2	46.7	43.9	39.4	35.1	27.2	25.0	28.0	34.6	39.4	44.1	45.6	46.7
Lowest min., °C	7.3	7.5	5.5	0.6	—2.7	—3.9	—2.1	—1.1	—0.9	0.4	2.1	5.6	—3.9
No. of days 30.0°C and over	25.1	22.1	16.3	5.6	0.4	0.0	0.0	0.0	0.2	4.0	10.1	21.8	106.6
No. of days 40.0°C and over	3.7	3.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.2	10.5
No. of days 2.0°C and under	0.0	0.0	0.0	0.0	1.2	2.8	3.4	4.3	1.9	0.2	0.0	0.0	13.5
<i>Wandering</i> —													
Temperature:													
Mean max., °C	31.6	30.9	28.2	23.6	18.8	15.8	14.9	15.9	18.1	21.0	25.8	29.4	22.8
Mean min., °C	13.6	13.4	11.8	8.7	6.2	4.9	3.9	4.0	4.9	6.1	8.9	11.8	8.2
Highest max., °C	45.6	44.6	41.9	37.2	33.2	25.0	23.8	26.1	30.9	36.9	39.8	42.8	45.6
Lowest min., °C	3.3	2.8	—0.6	—2.2	—5.6	—5.7	—4.4	—3.9	—2.8	—2.2	—1.7	1.0	—5.7
No. of days 30.0°C and over	20.5	16.9	11.3	2.7	*	0.0	0.0	0.0	*	1.6	6.9	16.3	76.2
No. of days 40.0°C and over	1.5	1.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	3.3
No. of days 2.0°C and under	0.0	0.0	*	1.2	5.8	6.7	8.9	10.7	9.2	4.8	1.1	—	48.2

TEMPERATURES AT REPRESENTATIVE CLIMATOLOGICAL STATIONS — *continued*

Reporting station and characteristic	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
<b>WHEAT BELT — <i>continued</i></b>													
<i>Narrogin —</i>													
Temperature:													
Mean max., °C	30.9	30.0	26.7	22.2	18.1	15.0	14.5	14.6	16.7	20.9	25.1	29.2	22.0
Mean min., °C	14.7	14.5	12.8	10.4	7.4	6.8	5.3	5.0	5.8	8.0	10.4	12.5	9.5
Highest max., °C	43.4	42.3	38.2	36.1	32.2	22.7	22.2	23.9	28.6	33.7	42.1	40.1	43.4
Lowest min., °C	8.4	6.1	3.6	0.8	-1.1	-2.7	-0.9	-0.9	-0.5	1.1	3.0	3.2	-2.7
No. of days 30.0°C and over	16.5	13.8	7.5	1.6	0.1	0.0	0.0	0.0	0.1	0.8	4.9	13.6	56.6
No. of days 40.0°C and over	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	1.8
No. of days 2.0°C and under	0.0	0.0	0.0	0.2	1.2	2.4	3.8	4.6	3.2	0.3	0.0	0.0	17.0
<i>Katanning —</i>													
Temperature:													
Mean max., °C	30.3	29.4	26.7	22.7	18.2	15.4	14.3	15.4	17.7	20.6	25.2	28.4	22.1
Mean min., °C	13.4	13.5	12.4	10.2	7.8	6.6	5.3	5.5	6.3	7.6	9.9	12.1	9.2
Highest max., °C	43.8	44.6	41.7	36.1	32.3	24.1	22.2	31.1	30.6	37.8	41.1	43.3	44.6
Lowest min., °C	5.0	3.3	1.7	0.6	-1.1	-2.1	-3.9	-2.2	-1.2	-0.6	1.7	2.7	-3.9
No. of days 30.0°C and over	16.7	13.3	8.4	1.3	*	0.0	0.0	0.0	0.0	1.2	5.0	12.5	58.1
No. of days 40.0°C and over	1.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.0
No. of days 2.0°C and under	0.0	0.0	0.0	*	1.3	2.5	2.7	3.5	2.2	0.5	0.0	0.0	12.8
<b>OTHER INLAND</b>													
<i>Halls Creek —</i>													
Temperature:													
Mean max., °C	37.0	36.3	35.7	34.2	29.7	27.4	26.9	29.8	34.0	37.4	38.5	38.3	33.8
Mean min., °C	24.3	23.8	22.9	20.4	17.0	13.8	12.3	14.5	18.5	22.7	24.3	24.6	19.9
Highest max., °C	44.0	42.6	42.1	39.4	36.7	33.8	33.6	36.6	38.8	43.8	43.8	44.9	44.9
Lowest min., °C	17.7	17.7	15.6	11.2	7.1	3.0	1.7	4.9	8.3	12.8	13.9	15.6	1.7
No. of days 30.0°C and over	29.7	27.0	29.8	27.9	16.6	6.3	6.3	16.1	27.4	30.5	29.7	30.5	279.2
No. of days 40.0°C and over	5.6	3.5	1.6	0.0	0.0	0.0	0.0	0.0	0.0	2.6	8.3	8.7	30.7
No. of days 2.0°C and under	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
<i>Marble Bar —</i>													
Temperature:													
Mean max., °C	41.2	40.3	39.3	36.1	30.8	27.1	26.7	29.6	34.1	37.4	40.7	41.8	35.4
Mean min., °C	26.1	25.6	24.6	21.1	16.3	12.7	11.4	13.0	16.5	20.0	23.6	25.3	19.7
Highest max., °C	49.2	48.3	46.7	45.0	39.4	35.6	35.0	37.2	42.6	45.6	47.2	48.3	49.2
Lowest min., °C	18.9	13.9	15.3	11.1	5.6	1.1	2.2	3.9	5.6	10.0	14.4	17.2	1.1
No. of days 30.0°C and over	30.7	27.7	30.7	28.7	19.4	6.3	5.1	12.5	26.2	30.2	29.8	30.7	279.8
No. of days 40.0°C and over	20.0	15.4	12.9	2.6	0.0	0.0	0.0	0.0	0.2	8.3	16.6	24.0	100.0
No. of days 2.0°C and under	0.0	0.0	0.0	0.0	0.0	0.0	*	0.0	0.0	0.0	0.0	0.0	*
<i>Mundiwindi —</i>													
Temperature:													
Mean max., °C	38.3	36.6	35.6	31.2	25.3	22.3	21.2	23.4	28.0	32.8	35.7	37.8	30.7
Mean min., °C	23.8	22.8	21.0	16.2	10.8	8.0	5.7	7.4	11.1	15.7	19.4	22.3	15.4
Highest max., °C	44.6	44.4	42.3	40.6	36.4	31.7	30.6	37.2	39.5	41.4	43.3	45.5	44.6
Lowest min., °C	13.9	12.8	9.4	3.9	-1.7	-4.4	-5.3	-3.6	-1.7	3.3	7.8	10.9	-5.3
No. of days 30.0°C and over	30.4	26.6	29.4	20.5	3.9	0.2	0.0	1.1	10.4	23.2	28.0	30.1	201.4
No. of days 40.0°C and over	10.9	5.2	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.9	8.0	27.2
No. of days 2.0°C and under	0.0	0.0	0.0	0.0	0.6	3.0	6.3	3.1	0.1	0.0	0.0	0.0	13.2
<i>Warburton Range —</i>													
Temperature:													
Mean max., °C	38.6	37.2	35.4	29.9	25.0	21.3	21.3	22.5	28.0	32.6	34.8	36.6	30.3
Mean min., °C	22.7	22.5	20.5	14.5	11.5	7.4	6.4	7.2	11.1	16.1	19.2	21.0	15.0
Highest max., °C	46.6	46.9	43.4	40.4	33.9	32.3	31.7	34.3	39.9	42.7	44.4	46.3	46.9
Lowest min., °C	10.0	9.1	9.6	1.8	-1.1	-2.6	-4.1	-2.2	1.1	4.1	7.2	9.4	-4.1
No. of days 30.0°C and over	30.0	26.6	27.4	16.5	4.1	0.0	0.0	2.2	12.0	23.1	25.5	29.3	197.8
No. of days 40.0°C and over	14.6	10.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	2.4	4.6	32.2
No. of days 2.0°C and under	0.0	0.0	0.0	0.0	0.6	1.7	5.9	1.5	0.4	0.0	0.0	0.0	8.7
<i>Meekatharra —</i>													
Temperature:													
Mean max., °C	37.8	35.9	34.3	28.9	23.6	19.6	18.6	20.7	24.9	29.6	33.5	36.3	28.6
Mean min., °C	24.2	23.1	21.3	16.8	11.9	9.2	7.3	8.1	11.1	15.1	18.9	22.2	15.8
Highest max., °C	44.3	43.8	43.6	38.8	34.3	28.3	27.9	32.6	35.9	39.4	42.3	45.0	45.0
Lowest min., °C	12.2	12.3	10.3	5.8	1.7	-3.1	-0.2	0.1	-0.6	5.2	7.2	11.1	-3.1
No. of days 30.0°C and over	29.9	26.3	26.8	13.3	1.5	0.0	0.0	0.2	3.8	13.5	22.7	29.0	169.4
No. of days 40.0°C and over	9.9	5.5	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	4.1	22.5
No. of days 2.0°C and under	0.0	0.0	0.0	0.0	0.1	0.4	1.0	0.4	*	0.0	0.0	0.0	1.8
<i>Laverton —</i>													
Temperature:													
Mean max., °C	36.3	34.3	32.0	27.8	22.6	19.1	17.7	19.9	24.2	28.7	32.3	34.2	27.4
Mean min., °C	21.0	19.9	18.1	14.7	9.9	7.7	5.4	6.2	9.4	13.7	16.8	19.1	13.5
Highest max., °C	46.1	46.1	44.4	40.0	35.0	30.2	30.1	33.9	36.8	40.6	43.9	45.6	46.1
Lowest min., °C	7.2	7.5	6.1	2.8	-0.9	-2.8	-4.2	-2.8	-1.1	2.2	4.4	10.0	-4.2
No. of days 30.0°C and over	27.7	22.7	20.4	11.6	1.7	0.1	0.0	0.4	3.5	13.2	21.0	25.3	146.7
No. of days 40.0°C and over	7.5	3.6	1.9	0.1	0.0	0.0	0.0	0.0	0.0	0.1	2.1	3.1	18.3
No. of days 2.0°C and under	0.0	0.0	0.0	0.0	0.7	1.5	5.5	3.7	0.2	0.0	0.0	0.0	11.6

TEMPERATURES AT REPRESENTATIVE CLIMATOLOGICAL STATIONS — *continued*

Reporting station and characteristic	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
<b>OTHER INLAND — <i>continued</i></b>													
<i>Kalgoorlie —</i>													
Temperature:													
Mean max., °C	33.6	32.0	29.5	25.2	21.0	17.8	16.5	18.2	21.7	26.1	29.4	32.0	25.3
Mean min., °C	18.3	17.7	15.8	12.3	8.3	6.7	4.8	5.1	7.3	11.0	14.0	16.5	11.5
Highest max., °C	46.4	43.3	44.5	38.9	32.9	27.6	28.1	29.7	35.1	40.7	41.7	45.0	46.4
Lowest min., °C	9.8	8.6	6.1	1.7	-1.8	-2.6	-3.4	-2.4	-0.6	-1.0	3.7	5.5	-3.4
No. of days 30.0°C and over	23.6	18.1	13.8	5.0	0.4	0.0	0.0	0.0	1.4	6.1	11.9	20.6	99.6
No. of days 40.0°C and over	3.2	2.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	*	0.4	1.7	7.8
No. of days 2.0°C and under	0.0	0.0	0.0	*	1.1	3.9	6.8	5.7	1.1	0.1	0.0	0.0	18.9
<i>Rawlinna —</i>													
Temperature:													
Mean max., °C	32.9	31.7	29.6	25.5	21.7	18.6	17.9	19.8	23.4	26.3	29.6	31.7	25.7
Mean min., °C	15.3	15.1	14.3	11.3	8.1	5.9	4.4	5.1	7.4	9.8	12.2	14.2	10.3
Highest max., °C	47.9	46.4	44.7	40.0	35.0	31.3	29.7	33.9	39.3	41.7	45.6	45.7	47.9
Lowest min., °C	5.6	5.0	6.1	1.7	0.0	-2.7	-2.3	-3.2	-0.6	0.7	0.8	5.1	-3.2
No. of days 30.0°C and over	22.9	17.0	14.4	7.0	1.2	*	0.0	0.5	3.0	9.0	13.7	19.4	105.8
No. of days 40.0°C and over	4.8	2.7	1.5	*	0.0	0.0	0.0	0.0	0.0	0.3	1.1	2.9	12.7
No. of days 2.0°C and under	0.0	0.0	0.0	*	0.5	2.6	6.2	4.3	1.2	0.0	*	0.0	15.2
<i>Collie —</i>													
Temperature:													
Mean max., °C	31.1	30.6	27.7	22.4	19.1	16.5	15.6	16.3	18.0	21.3	24.8	28.9	22.7
Mean min., °C	14.2	14.1	12.3	9.5	7.1	6.2	4.7	4.7	6.1	7.8	10.2	12.6	9.1
Highest max., °C	44.4	43.4	40.8	36.7	30.4	24.4	22.8	26.1	30.3	36.3	38.8	41.7	44.4
Lowest min., °C	3.2	1.8	0.2	-1.3	-2.2	-4.0	-3.9	-3.2	-2.2	-0.6	0.3	1.7	-4.0
No. of days 30.0°C and over	18.6	14.8	9.5	1.6	*	0.0	0.0	0.0	0.0	1.3	5.3	12.9	63.3
No. of days 40.0°C and over	1.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.8
No. of days 2.0°C and under	0.0	0.0	*	0.8	2.7	5.3	6.3	7.6	4.1	1.1	0.2	0.0	28.3
<i>Manjimup —</i>													
Temperature:													
Mean max., °C	26.6	26.5	24.3	20.6	17.1	15.1	14.0	14.8	16.4	18.3	21.5	24.3	19.9
Mean min., °C	12.6	12.7	12.0	10.1	8.3	7.1	5.8	6.0	6.8	7.8	9.6	11.2	9.2
Highest max., °C	41.7	41.2	38.9	33.6	29.2	22.9	21.7	24.7	28.1	33.3	37.4	38.8	41.7
Lowest min., °C	5.6	4.4	3.3	1.6	1.1	0.2	-2.8	-1.1	-0.6	0.1	1.7	4.4	-2.8
No. of days 30.0°C and over	10.3	10.0	4.8	0.4	0.0	0.0	0.0	0.0	0.0	0.2	1.4	6.6	33.2
No. of days 40.0°C and over	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
No. of days 2.0°C and under	0.0	0.0	0.0	0.1	0.1	0.7	0.4	0.8	0.3	0.1	0.0	0.0	2.4
<i>Pemberton —</i>													
Temperature:													
Mean max., °C	25.9	25.8	23.9	20.4	17.6	15.6	14.6	15.3	16.4	18.3	21.1	23.4	19.8
Mean min., °C	12.9	13.2	12.6	10.6	8.9	8.2	6.9	6.6	7.2	8.1	9.8	11.6	9.7
Highest max., °C	41.7	40.1	38.9	33.9	28.3	23.2	22.0	25.6	28.3	41.2	36.9	38.5	41.7
Lowest min., °C	4.4	4.4	3.9	2.8	0.0	-0.4	-1.4	-1.1	-0.3	0.6	2.5	3.9	-1.4
No. of days 30.0°C and over	8.1	7.9	4.1	0.6	0.0	0.0	0.0	0.0	0.0	0.9	1.2	4.6	29.1
No. of days 40.0°C and over	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.4
No. of days 2.0°C and under	0.0	0.0	0.0	0.0	0.0	0.5	0.1	0.5	0.5	0.2	0.0	0.0	1.7
<i>Mount Barker —</i>													
Temperature:													
Mean max., °C	27.4	26.3	24.7	21.0	18.1	15.5	14.8	15.0	16.5	19.2	21.8	24.9	20.4
Mean min., °C	13.3	13.6	12.7	10.8	8.7	7.5	6.5	6.0	6.7	8.3	10.0	12.0	9.7
Highest max., °C	43.9	43.6	40.6	37.2	32.2	24.3	22.2	25.0	29.3	35.6	39.4	42.9	43.9
Lowest min., °C	1.7	3.9	3.6	2.2	0.6	0.0	-0.4	-1.3	-0.6	0.6	1.1	1.1	-1.3
No. of days 30.0°C and over	9.6	7.5	5.2	0.8	0.1	0.0	0.0	0.0	0.0	0.5	2.3	6.1	31.8
No. of days 40.0°C and over	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
No. of days 2.0°C and under	0.0	0.0	0.0	0.0	0.1	0.3	0.7	0.7	0.4	0.0	0.0	0.0	2.2

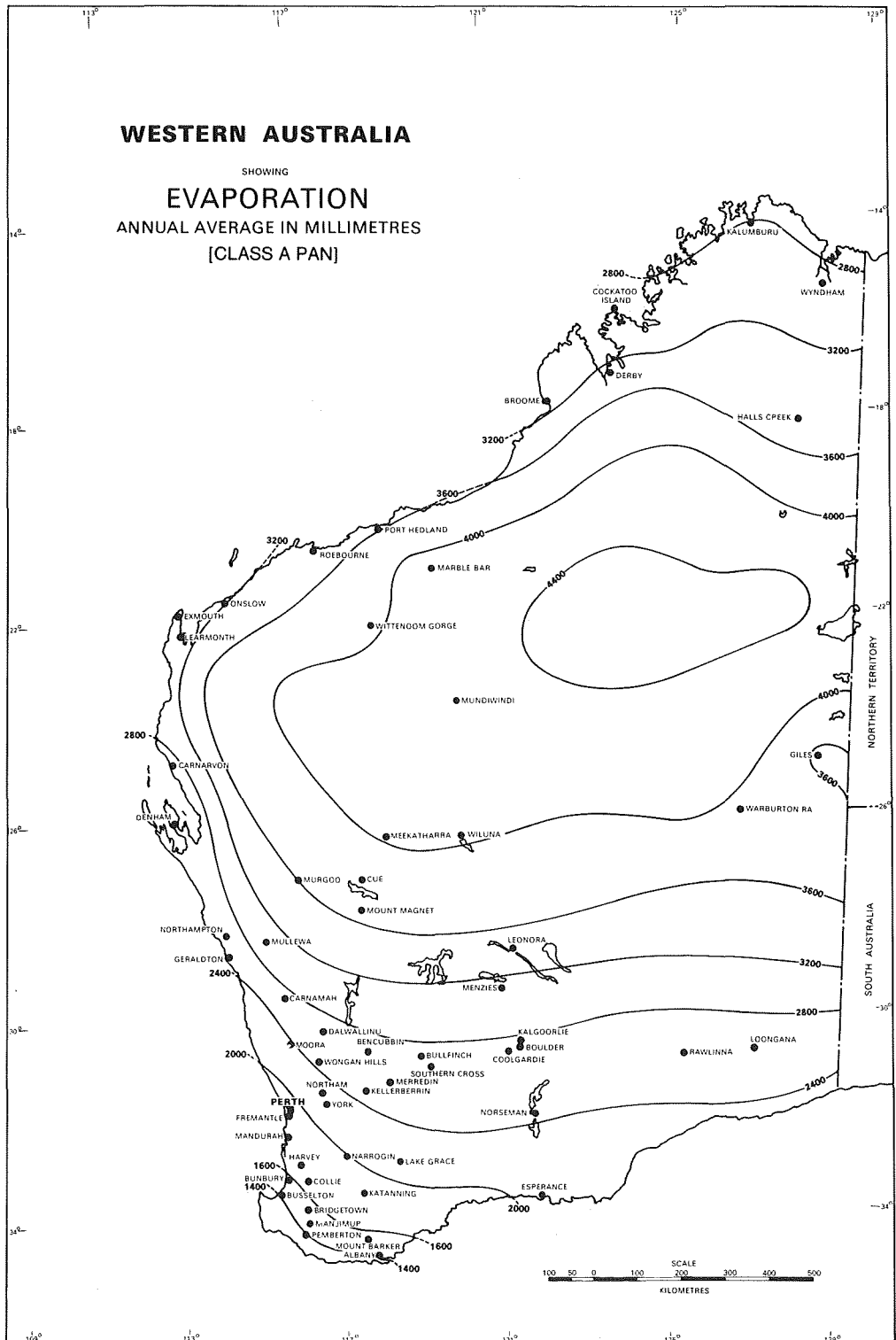
\* Number of occurrences is greater than 0.0 but less than 0.05.

## THUNDERSTORMS

Thunderstorms are most frequent along the Kimberley coast where they occur during the 'Wet' season but are practically unknown in the 'Dry'. In the remainder of the tropics they occur over roughly the same period but the season is a little shorter and the storms less frequent.

In most of the State south from the tropics thunderstorms are most frequent in the summer months but in the south-west they are more uniformly distributed and in many places in coastal districts they are most frequent in winter.

The winter storms are often accompanied by hail which, however, is usually not heavy enough to cause any damage. Hail accompanying summer storms can be much heavier, and occasionally damages ripening crops in the wheat belt. Both winter and summer thunderstorms may be accompanied by severe squalls, but these are infrequent.



## EVAPORATION

Except in the lower south-west, evaporation from a free water surface exceeds the annual rainfall, and in a large proportion of the State it is more than ten times greater than the rainfall.

It is least in the winter months, amounting in July to less than fifty millimetres in the far south-west, and to about 225 millimetres in the northern tropics. In January, when evaporation is highest, it totals about 200 millimetres on the far south coast and reaches 500 millimetres in the East Gascoyne and North-Eastern Meteorological Districts. Further north, evaporation is reduced by the moister air over the tropics at this time of the year.

The average annual evaporation throughout the State is shown on the preceding map.

## GROWING SEASON

Less moisture is required to sustain plant life when evaporation is low than when it is high, and the minimum amount required can be related to evaporation from a free water surface.

That part of the year during which rainfall is greater than this minimum amount (the 'effective rainfall'), may be taken as the *growing season*. The map on page 64 shows the length of this season in the agricultural area of the State. It is based on average monthly rainfall and effective rainfall, the latter being calculated from the formula  $P = 1.43 \times E^{0.7}$  (after Prescott), where P is effective rainfall and E is evaporation (both in millimetres per month). Evaporation was measured by the Australian sunken tank.

## METROPOLITAN CLIMATE

Perth has more sunshine and a greater number of clear days during the year than any other State capital city. It also has the wettest winter, the driest summer, and is the windiest of the capital cities. The highest temperature on record for Perth is 44.7°C (12 January 1978) and the lowest 1.2°C (7 July 1916).

## CLIMATOLOGICAL DATA — PERTH BUREAU OF METEOROLOGY

(For other data relating to Temperature and Rainfall see preceding tables.)

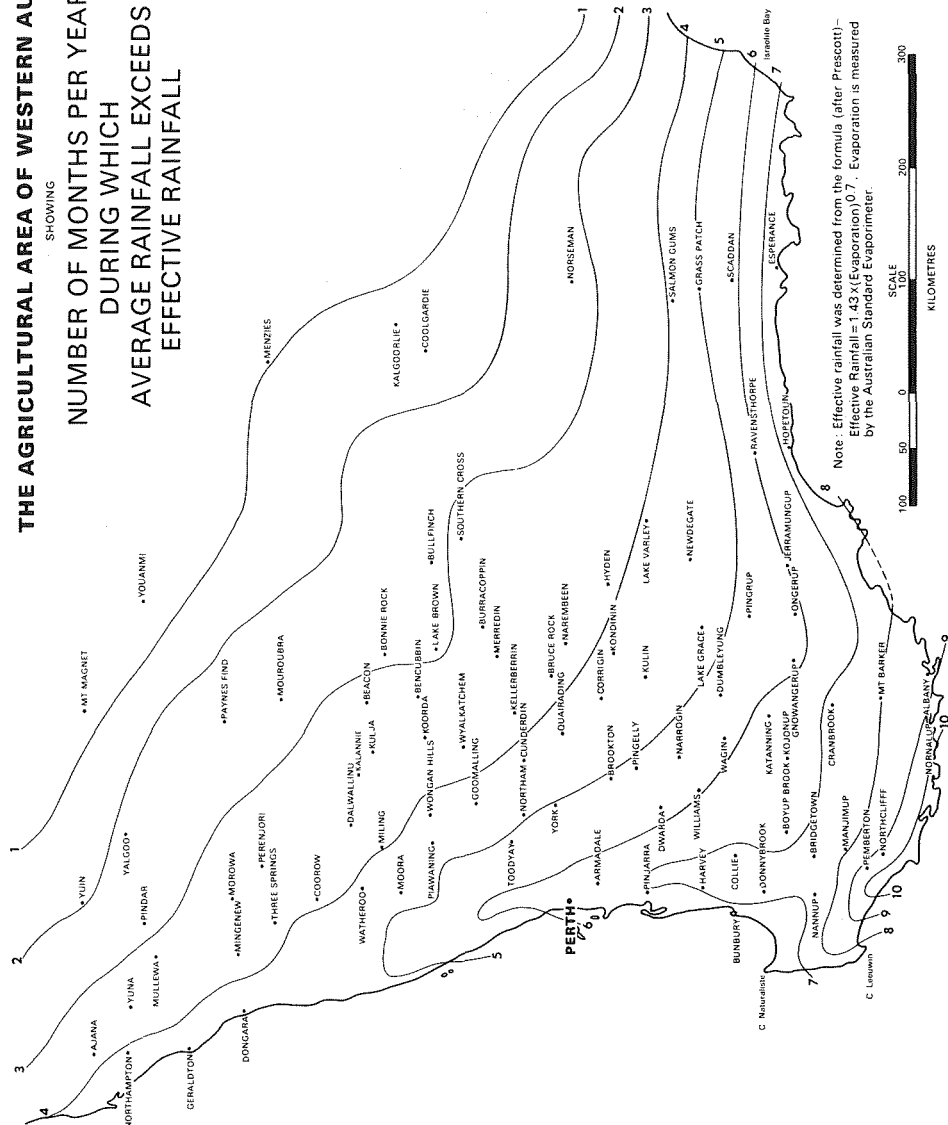
Month	Wind		Speed		Temperature		Relative humidity (Saturation = 100%)		Sunshine — Mean daily amount		Cloud (proportion of sky covered) — Mean of readings at 9 a.m., 3 p.m. and 9 p.m.		Evaporation — Mean daily amount	
	Prevailing direction													
	9 a.m.	3 p.m.	Average	Highest	Highest in sun	Lowest terrestrial	Mean	At 3 p.m.	Mean daily amount	Mean daily amount	30 (a)	13 (b)	30 (a)	13 (b)
Number of years of observations	30 (a)	30 (a)	60	63	78	30 (a)	30 (a)	30 (a)	30 (a)	30 (a)	30 (a)	13 (b)	30 (a)	13 (b)
January	E	SSW	17.5	81	80.7	22/1914	4.2	20/1925	53	43	10.4	29	9.3	29
February	ENE	SSW	17.2	113	78.7	4/1934	4.3	1/1913	52	43	9.8	31	8.9	31
March	E	SSW	16.2	113	75.0	19/1918	2.6	(c)	57	46	8.8	35	7.1	35
April	ENE	SSW	13.7	130	69.4	8/1916	-0.7	26/1960	60	48	7.5	42	4.4	42
May	NE	WSW	13.5	119	63.3	4/1925	-3.9	31/1964	68	58	5.7	54	3.0	54
June	N	NW	13.5	129	57.5	9/1914	-3.4	27/1946	72	63	4.8	59	2.3	59
July	NNE	W	14.2	137	56.2	13/1915	-3.8	30/1920	73	63	5.4	56	2.4	56
August	N	WNW	15.1	156	62.8	29/1921	-3.0	18/1966	71	60	6.0	56	2.8	56
September	ENE	SSW	15.1	109	67.5	29/1916	-2.7	(d)	64	57	7.2	49	4.0	49
October	SE	SW	16.1	105	71.8	19/1954	-1.2	16/1931	64	54	8.1	48	5.7	48
November	E	SW	17.2	101	75.0	30/1925	-1.1	1/1968	57	47	9.6	39	7.1	39
December	E	SSW	17.7	103	76.0	11/1927	3.3	29/1957	54	46	10.4	32	8.7	32
Year —														
Average	E	SSW	15.6	..	..	22/1/14	..	..	62	52	7.8	44	..	..
Extremes	..	..	..	156	80.7	22/1/14	-3.9	31/5/64	..	..	..	..	..	..

(a) Standard 30 year's normal (1911-1940). (b) Class A Pan 1967-1979. Correction of +7% applied for bird screen. (c) Recorded on 8 March 1903 and 16 March 1967. (d) Recorded on 8 September 1952 and 6 September 1956.

# THE AGRICULTURAL AREA OF WESTERN AUSTRALIA

SHOWING

NUMBER OF MONTHS PER YEAR  
DURING WHICH  
AVERAGE RAINFALL EXCEEDS  
EFFECTIVE RAINFALL



Note: Effective rainfall was determined from the formula (after Prescott) —  
Effective Rainfall =  $1.43 \times (\text{Evaporation})^{0.7}$ . Evaporation is measured  
by the Australian Standard Evaporimeter.

## SNOW

Snow has been known to fall as far north as Wongan Hills, but it is only in the southern districts that it occasionally lies on the ground. It is seen on top of the Stirling Range for a short time nearly every winter, but elsewhere is very infrequent and of negligible importance.

## INTERSTATE COMPARISONS

In general, humidity and rainfall are lower in Western Australia than in corresponding places in eastern Australia. The following table shows average rainfall, mean humidity and temperature for groups of reporting stations at approximately the same latitude. The stations have been selected in such a way that, in each pair, one is on the west coast and the other on the east coast or, where a pair relates to inland stations, each station is situated at about the same distance from the coast. The group appearing last in the table has been included to provide a comparison between observations at Albany, the most southerly town in Western Australia, and those at places elsewhere in Australia at about the same latitude. The height above mean sea-level is also given for each station.

## INTERSTATE COMPARISONS — RAINFALL, HUMIDITY, TEMPERATURE

Reporting station	Height above mean sea- level	Average rainfall		Relative humidity (a) (9 a.m.)		Average daily mean temperature	
		May to October	November to April	May to October	November to April	May to October	November to April
	metres	mm	mm	%	%	°C	°C
Bunbury	5	753	129	75	66	13.7	19.6
Sydney, New South Wales	42	590	626	67	65	14.9	21.0
Perth	19	753	120	73	56	14.7	21.7
Newcastle, New South Wales	34	560	585	72	75	14.7	20.7
Kalgoorlie	380	135	128	64	49	13.8	23.1
Cobar, New South Wales	251	165	191	62	42	14.0	24.6
Geraldton	4	408	74	69	50	16.0	23.3
Brisbane, Queensland	42	366	780	64	65	17.7	23.7
Wiluna	518	83	160	49	32	15.9	27.1
Charleville, Queensland	294	158	357	56	46	15.5	25.7
Carnarvon	5	171	77	62	59	18.6	24.6
Bundaberg, Queensland	14	318	841	66	69	18.5	24.5
Mundiwindi	561	69	193	38	29	18.5	28.4
Longreach, Queensland	187	117	374	49	44	19.1	27.9
Onslow	4	117	148	53	46	20.6	28.3
Mackay, Queensland	11	262	1,378	72	75	19.5	25.3
Port Hedland	8	66	238	38	45	22.2	29.8
Townsville, Queensland	22	107	1,097	62	67	21.5	26.6
Derby	16	44	525	38	59	26.4	31.2
Innisfail, Queensland	7	912	2,732	82	81	21.2	25.7
Wyndham	7	40	708	34	52	27.5	31.4
Cooktown, Queensland	5	223	1,561	73	76	23.9	27.2
Albany	13	591	218	81	67	12.5	18.0
Adelaide, South Australia	43	365	168	68	50	13.4	20.5
Swan Hill, Victoria	70	201	144	77	51	11.8	20.6
Canberra, Australian Capital Territory	560	293	340	78	63	8.1	17.3

(a) Saturation = 100%.



## Chapter II— continued

### Part 3 — The Vegetation of Western Australia <sup>(1)</sup>

Contributed by T. E. H. Aplin  
(Western Australian Herbarium, Department of Agriculture)

The flora of Western Australia consists of about 6,500 species of flowering plants (angio-sperms), 15 cycads and conifers (gymnosperms) and 50 ferns. The families of flowering plants which characterise the flora are also widespread throughout Australia, e.g. Myrtaceae, Proteaceae and Leguminosae. The Stylidiaceae, Goodeniaceae and Epacridaceae, which are poorly represented outside Australia, are well developed in Western Australia. The five families which are endemic in Western Australia are entirely restricted to the South-West Province. These are the Cephalotaceae, Eremosynaceae, Emblingiaceae, Ecdeiocolaceae and Anarthriaceae. Other large groups of plants (below the level of family) which are almost wholly endemic in this State are the *Chloanthoideae* (Verbenaceae), *Prostantheroideae* (Lamiaceae), *Persoonieae* and *Banksieae* (Proteaceae) and *Epacrideae* (Epacridaceae). The *Chamelaucoideae* (Myrtaceae), although not strictly endemic, has a high percentage of species restricted to Western Australia. At the generic level there are forty-seven monotypic genera, most of which are endemic in the South-West Province.

The State of Western Australia occupies about one-third of the continental land-mass of Australia and lies south of the equator between latitudes 13° and 35°. One-third of the State lies within the tropics, while the remainder extends into the temperate zone. Climatically, Western Australia shows a marked variation from a predominantly summer rainfall pattern in the north to a characteristically Mediterranean-type winter rainfall pattern in the south. Between these two rainfall systems is a large region whose climate is characterised by the extreme variability of the rainfall both annually and seasonally.<sup>(2)</sup> The vegetation of Western Australia, in general terms, is determined by these varying climatic patterns, although local changes in geology, soils, topography and drainage may affect the structure and/or the floristic composition of plant communities. The delineation of the present day vegetation also reflects the past tectonic and climatic history of the Australian continent.

The development of the so-called pan-Australian mesophytic flora, which includes the tropical broad-leaved genera *Cinnamomum* and *Tristania*, the more temperate genera *Dacrydium*, *Podocarpus*, *Araucaria*, *Nothofagus* and *Phyllocladus* and the typically Australian genera *Eucalyptus*, *Casuarina*, *Callitris* and *Banksia*, began early in the Tertiary era. It is generally accepted that in the Palaeozoic era the Australian continent was united with the continents of Africa, Antarctica, India and South America in a once common land-mass known as Gondwanaland. During this period these continents had a common flora as exemplified by the *Glossopteris* elements. In the late Neocomian period (Early Cretaceous), rifting between India (with Africa and South America) and Australia (with Antarctica) was initiated. In Eocene times (Early to Mid-Tertiary), sea-floor spreading between Australia and Antarctica commenced and for the first time the southern coasts were warmed by the entering Indian Ocean. The early Tertiary flora of the South-West Province contained several sub-tropical rainforest and mangrove genera in abundance. This phenomenon has prompted the suggestion that some 'tropical' elements may in fact be 'palaeoantarctic' in origin. The Australian continental block

<sup>(1)</sup> See *Appendix* for reference to additional information in earlier issues of the Year Book.

<sup>(2)</sup> See Part 2 of Chapter II, — *Climate and Meteorology*.

was isolated at about the time the pan-Australian flora began to develop, and the northward drift of the continent which brought the Australian block into contact with the Asian block in the middle Miocene period (Late Tertiary) allowed the entry of a different flora, the 'Indo-Malayan' flora.

The degree of endemism and diversification in the south-western flora, which had its origin in pre-Miocene times, was brought about largely by the isolation caused by the late Eocene and Miocene seas which inundated the Nullarbor Shelf. Another factor that contributed to the diversification of the flora was the lateritisation that occurred in the Tertiary period, with the subsequent dissection of the lateritic landscape causing fragmentation of a once continuous flora.

Plant taxonomists and morphologists cannot entirely agree, among themselves, on the evolutionary relationships of plants. However, certain floral and morphological characters are considered to be primitive or to have developed at a very early stage in the evolution of plants. Primitive floral characters are seen in 27 relict genera in Western Australia (17 in the South-West Province, 12 in the Eremaean Province and 16 in the Northern Province). They include *Cycas*, *Macrozamia*, *Callitris*, *Casuarina*, *Hibbertia*, *Emblingia*, *Codonocarpus*, *Persoonia*, *Clematis* and *Pandanus*. Relict species which have retained primitive morphological characters number 234 for the State. A large proportion of these are found in the South-West Province. One hundred and nine species are present in the Stirling botanical district. Many endemic genera are represented, e.g. *Isopogon*, *Adenanthos*, *Stirlingia*, *Synaphea* and *Franklandia* (Proteaceae) and *Andersonia*, *Sphenotoma*, *Cosmelia*, *Lysinema*, *Coleanthera* and *Conostephium* (Epacridaceae). *Thysanotus* (Liliaceae) and *Stylidium* (Stylidiaceae) which, although not strictly endemic in, are most richly represented in the State.

### Formations and Alliances

The classification of vegetation involves the grouping of similar structural units and the grouping or classification of the floristic components present in all strata of plant communities that form part of the vegetation.

In a survey of major plant communities of Australia and Papua New Guinea for the Conservation of Terrestrial Communities Section of the International Biological Programme (I.B.P./C.T.) a structural classification scheme was devised. This scheme, produced by Australian plant ecologists and freed from previous conceptions of the Australian vegetation, was considered to be easy to understand and to use in the field in Australia. The classification of plant communities involved a simple two-dimensional table using the variables height/life form of the tallest stratum, and the projective foliage cover of the tallest stratum. Major structural formations recorded in Australia are summarised in the table which follows and further divisions based on height classes and projective foliage cover can be instituted. The nature of the understorey provides logical subdivisions to the formations.

To include floristic detail, the following three categories are often used to define subdivisions within a structural formation.

1. *Alliance* — A series of climax plant communities which have (i) the same structural characteristics, (ii) related species as dominants in the uppermost stratum, and (iii) possibly the same or related species in the understorey.
2. *Association* — A series of climax plant communities which have (i) the same structural characteristics, (ii) the same species as dominants in the uppermost stratum, and (iii) possibly different floristic composition in the understorey.
3. *Society* — A series of climax plant communities which have (i) the same structural characteristics, (ii) the same species as dominants in the uppermost stratum, and (iii) the same species prominent in the lower strata.

High open forest and high woodland are represented by *Eucalyptus diversicolor* (Karri), *E. marginata*-*E. calophylla* (Jarrah-Marri) and *E. gomphocephala* (Tuart) alliances, all in the South-West Province.

The forest formations are represented by *E. marginata*-*E. calophylla* and *Agonis flexuosa* (West Australian Peppermint) alliances in the South-West Province; and by *E. tetradonta*-*E. miniata* (Darwin Stringybark-Darwin Woollybutt), *E. tectifera*-*E. grandifolia* (Darwin Box-Cabbage Gum) alliances in the Northern Province. Woodland and open woodland formations are represented by *E. loxophleba* (York Gum), *E. wandoo* (Wandoo), *E. salmonophloia* (Salmon Gum), *E. occidentalis* (Swamp Yate), *E. astringens* (Brown Mallet), *E. cornuta* (Yate), *E. rudis*-*Melaleuca* spp. (Flooded Gum-Paperbark) and *Casuarina obesa* (Swamp Sheoak) alliances in the South-West Province; by *E. torquata*-*E. lesouefii* (Coral Gum-Goldfields Blackbutt), *E. dundasii* (Dundas Blackbutt) and *E. transcontinentalis*-*E. flocktoniae* (Redwood-Merrit) alliances in the Eremaean; and by *E. camaldulensis* (River Red Gum), *E. tectifera*-*E. grandifolia*, *E. tetradonta*-*E. miniata*, *E. latifolia* (Round-leaf Bloodwood), *E. papuana* (Ghost Gum), *E. polycarpa*-*E. apodophylla* (Small-flowered Bloodwood-Whitebark), *E. microtheca* (Flooded Box) and by *Terminalia* spp., *Melaleuca* spp. and *Adansonia gregorii* (Baobab) alliances in the Northern Province.

The low forest formations are represented by *Melaleuca lanceolata*-*Callitris preissii* (Rottneest Teatree-Rottneest Cypress Pine), *E. platypus*-*E. spathulata*-*E. annulata* (Moort-Swamp Mallet-Open-fruited Mallee), *E. cornuta* (Yate), *E. lehmannii* (Bushy Yate), *Agonis juniperina* (Warren River Cedar), *Banksia menziesii*-*B. attenuata*-*Casuarina fraserana*-*E. todiana* (Menzies Banksia-Slender Banksia-Fraser's Sheoak-Pricklybark), *E. falcata*, and *B. prionotes* (Acorn Banksia) alliances in the South-West Province. Low woodland and low open woodlands are represented by *E. erythrocorys* (Illyarrie), *Casuarina huegeliana* (Rock Sheoak) and *Banksia* spp. alliances in the South-West Province; by *E. brevifolia* (Northern White Gum), *E. pruinosa* (Silver Box), *E. dichromophloia* (Variable-barked Bloodwood), *E. argillacea* (Northern Grey Box), *E. microtheca*, *Grevillea striata* (Beefwood), *Lysiphyllum cunninghamii* (Bauhinia) and *Melaleuca* spp. (Paper Bark) alliances in the Northern Province; and by *E. gongylocarpa* (Desert Gum), *E. kingsmillii* (Kingsmill's Mallee), *E. leucophloia* (Migum), *Casuarina decasneana* (Desert Sheoak), *Acacia aneura* (Mulga) and *A. sowdenii* (Myall) alliances in the Eremaean Province.

The scrub formations are represented in the South-West Province by *Acacia rostellifera*-*A. cyclops*-*A. cochlearis*, *Agonis* spp., *Pultenaea reticulata*, *Melaleuca huegelii*, *M. globifera*, *E. foecunda* (Narrow-leaved Red Mallee), *Acacia* spp.-*Casuarina* spp.-*Melaleuca* spp. (Woodjil-Tamar-Broombush) and mixed Proteaceae-Myrtaceae alliances; and by *Melaleuca thyoides*, *Melaleuca uncinata* and *Acacia aneura* (Mulga) alliances in the Eremaean Province. High shrubland formations include *Actinostrobus arenarius* (Sandplain Cypress Pine), *Banksia ashbyi*-*B. sceptum*, *B. baxteri*, *B. speciosa* (Showy Banksia), *E. redunca*-*E. uncinata* (Black Marlock-Hook-leaf Mallee), *E. tetragona* (Tallerack), *Grevillea eriostachya*-*G. didymobotrya*-*G. leucopteris* and *B. hookerana*-*Xylomelum angustifolium* (Banksia-Sandplain Woody Pear) alliances in the South-West Province; and *Acacia* spp.-*Cassia* spp.-*Eremophila* spp., *E. kingsmillii*, *E. youngiana* (Large-fruited Mallee), *Acacia victoriae*, *A. pyrifolia*, *A. pachycarpa*-*Grevillea wickhamii*, *Acacia lysiphloia*-*Acacia* spp., and *A. aneura* alliances in the Eremaean Province.

Heath and low heath formations are restricted to the South-West Province and are made of mixed communities in which the families Proteaceae, Myrtaceae, Epacridaceae, Xanthorrhoeaceae and Leguminosae are well represented. The genera *Dryandra*, *Banksia*, *Hakea*, *Casuarina*, *Xanthorrhoea* (Blackboy or Grass Tree), *Leptospermum*, *Kunzea* and *Melaleuca* usually dominate the heath communities. Shrubland and low shrubland formations are dominated by chenopodiaceous shrubs. The most important alliances are *Maireana sedifolia* (Blue Bush), *Atriplex* spp. (Saltbush) and *Arthrocnemum* spp. (Samphire), which are well represented in the Eremaean Province.

The hummock grasslands are dominated by species of *Triodia* and *Plectrachne*. These genera, commonly called Spinifex, grow outwards leaving the centre senescent or dead. This formation is found in the Eremaean Province. Tussock grasslands are dominated by species of

*Astrelba* (Mitchell Grass), *Dichanthium-Chrysopogon* (Blue Grass-Ribbon Grass), *Iseilema* (Flinders Grass) and by *Themeda* (Kangaroo Grass) alliances with *Sehima* (White Grass), *Heteropogon* (Bunch Speargrass), *Cymbopogon* (Scent Grass), *Sorghum* (Wild Sorghum) and *Aristida* (Three-awn Grass) usually seen only under woodland formations. Fringing grasslands include *Coelorhachis*, *Arundinella* (Reed Grass) and *Imperata* (Blady Grass). These formations are restricted to the Northern Province. Sedgelands are represented in the South-West Province by communities in which the families Juncaceae, Cyperaceae, Restionaceae and Anarthriaceae are prominent.

Other plant communities, recorded in edaphic complexes, include coastal dune vegetation, halophytic communities, swamp communities, lithic complexes and aquatic complexes. Each of these complexes may be unimportant in terms of area, but is of significance in providing the habitat for particularly interesting plants, e.g. *Cephalotus*, *Byblis*, *Drosera*, etc.

#### PLANT COMMUNITIES — MAJOR STRUCTURAL FORMATIONS

Life-form and height of tallest stratum		Projective foliage cover of tallest stratum, as per cent	Description
Trees over 30 m	....	70-100	High closed forest
		30-70	High open forest
		10-30	High woodland
		under 10	High open woodland
Trees 10-30 m	....	70-100	Closed forest
		30-70	Open forest
		10-30	Woodland
		under 10	Open woodland
Trees under 10 m	....	70-100	Low closed forest
		30-70	Low open forest
		10-30	Low woodland
		under 10	Low open woodland
Shrubs over 2 m	....	70-100	Closed scrub
		30-70	Open scrub
		10-30	High shrubland
		under 10	High open shrubland
Shrubs 1-2 m	....	70-100	Closed heath
		30-70	Open heath
		10-30	Shrubland
		under 10	Open shrubland
Shrubs under 1 m	....	70-100	Low closed heath
		30-70	Low open heath
		10-30	Low shrubland
		under 10	Low open shrubland
Herbs	....	70-100	Closed herbland, closed tussock grassland, closed sedgeland, etc.
		30-70	Herbland, tussock grassland, sedgeland, etc.
		10-30	Open herbland, open tussock grassland, open sedgeland, etc.
Hummock grasses	....	10-30	Hummock grassland
		under 10	Open hummock grassland

#### Botanical Provinces and Districts

The vegetation of Western Australia has been sub-divided into three Botanical Provinces. The areas that these provinces occupy are determined largely by climatic pattern. Within each province are smaller regions, known as Botanical Districts, in which the

structure and floristics of the vegetation are determined partly by climate and partly by geology and soils. The boundaries of these provinces and districts are shown on the map later in this Part.

The *Northern Province*, or Tropical Zone, is characterised by a dry monsoonal climate. The rainfall received in the summer months ranges from less than 500 mm to over 1,250 mm per annum. The annual mean maximum temperature is over 30°C. The evaporation rate ranges from 2,000-2,500 mm per annum.

The vegetation formations consist of grassy *Eucalyptus* open forests and woodlands. The major components are 'Australian' elements, with 'Indo-Malayan' elements as minor components. The latter are usually found in special habitats such as streamlines or scarps. Some important 'Indo-Malayan' genera are *Ficus* (Moraceae), *Barringtonia* (Lecythidaceae) and *Terminalia* (Combretaceae).

The *Gardner* botanical district, commonly referred to as the Kimberley Plateau, consists of a series of sandstone, shale, quartzite and volcanic rocks. The topography varies from alluvial flats through rolling to hill landscape to very rugged dissected plateau. Saline mud flats are present along estuaries.

On the volcanic rocks and shales, on gently undulating to hilly topography, the woodland and open woodland formations consist mainly of *E. tectifica*-*E. grandifolia* alliance. The *E. tectifica* sub-alliance is restricted to the volcanic soils while the *E. grandifolia* sub-alliance is developed on the shales and sandstones. *E. latifolia* and *E. papuana* alliances characterise the flats and levee soils. These alliances and sub-alliances include a number of plant associations. Each association is characterised by one or more *Eucalyptus* species. The understorey layers consist of a sparse low tree or high shrubland layer and a dense to moderately dense grassland layer. Small tree genera include *Cochlospermum*, *Terminalia*, *Atalaya* and *Erythrophleum*. Grass genera include *Dichanthium*, *Sehima*, *Chrysopogon*, *Sorghum*, *Heteropogon* and *Themeda*.

On the sandstone and quartzite rocks, ranges and hogbacks, the woodland, open woodland and low open woodland formations are mainly made up of *E. tetradonta*-*E. miniata* alliance. In this alliance, the *E. tetradonta* sub-alliance is found mainly in the northern high-rainfall region while the *E. phoenicea*-*E. ferruginea* (Scarlet Gum-Rusty Bloodwood) sub-alliance is its southern lower-rainfall counterpart. *Callitris intratropica* (Northern Cypress Pine) forms pure stands on deep red sands. The *E. dichromophloia* alliance is found on skeletal sands in rugged sandstone areas. The small tree/shrub layer in the *E. tetradonta*-*E. miniata* alliance includes the genera *Petalostigma*, *Grevillea*, *Gardenia*, *Persoonia*, *Buchanania*, *Ventilago*, *Planchonia*, *Eugenia*, *Brachychiton*, *Terminalia*, *Acacia*, *Jacksonia* and *Melaleuca*. The grass storey is dominated by *Plectrachne pungens*, together with *Sorghum* and *Aristida*. Flats and levees usually carry a *E. polycarpa*-*E. apodophylla* alliance, while the very steep scarps carry a *Brachychiton* spp.-*Terminalia* spp.-*E. confertiflora* variable woodland.

Other alliances and associations found in the Gardner botanical district are *Terminalia* spp.-*Dichanthium* spp. woodland and grassland communities, on soils of heavy texture; *E. brevifolia*, *E. argillacea* and *Melaleuca viridiflora* associations on podsolics, over shales and sandstones; fringing communities of *E. camaldulensis* and *Terminalia* spp.-*Ficus* spp.-*Melaleuca* spp.; and mangrove communities on the estuarine mud flats. Closed mixed forests of 'Indo-Malayan' elements such as *Calophyllum*, *Ficus*, *Carallia*, *Barringtonia*, *Nauclea*, *Randia* and *Myristica* and *Melaleuca leucadendron* (Cadjaput) fringe gullies, while semi-deciduous vine thickets with lianes such as *Aristolochia*, *Capparis*, *Cansjera*, *Adenia* and *Canavalia* occur in small pockets.

The alluvial flood plains of the Ord River system carry a tall grass formation including the genera *Dichanthium*, *Astrebla*, *Chrysopogon*, *Sorghum* and *Ophiurus*. Frontage woodlands

carry a *E. papuana* alliance. *E. tetradonta*-*E. miniata* alliance occurs mainly on lateritic areas or on acid rocks. *E. tectifera*-*E. grandifolia* alliance occurs more commonly on soils formed on basic rocks, or shales and limestones. In the Hall botanical district, the low open woodlands of *E. pruinosa* association are the low-rainfall counterparts of the *E. tectifera* woodlands and occur on soils derived from basic rocks. *E. brevifolia* association is generally seen on skeletal soils on acid rocks, and also on many other soils. Low open woodlands of *Terminalia* spp. alliance occur on cracking clay soils formed on volcanics and limestone. Tussock grasslands with *Astrebla*, *Dichanthium*, *Chrysopogon* and *Panicum* occur on high-level plains of Tertiary alluvia. The rugged hilly country of the Halls Creek ridges carries *E. brevifolia* and *E. pruinosa* low open woodland associations over *Triodia intermedia*. The gently undulating plains with calcareous soils carry arid short grass communities of *Enneapogon* (Bottle Washers), *Aristida* and *Sporobolus*. These areas have suffered severe wind and gully erosion and have in recent years been resown to the alien *Cenchrus ciliaris* (Buffel Grass). Low open woodlands of *E. argillacea* are present on red soils on basic rocks (limestone dolomites and volcanics).

The Fitzgerald botanical district consists essentially of mountain ranges, plateaus and steep-sided valleys. The ranges and plateaus are made up of quartzite and shale-sandstone with lateritic remnants, lightly covered with a thin soil mantle. The vegetation comprises mainly low open woodland of *E. brevifolia*, *E. dichromophloia* and *E. phoenicea*-*E. ferruginea* communities, with a patchy shrub layer and *Plectrachne pungens* as the main ground component.

The land systems eroded below the quartzite and sandstone surfaces comprise basalt hills with narrow valleys. The vegetation consists of *E. tectifera* woodlands with *Sehima nervosum-sorghum* sp. ground storey on the hills and *Chrysopogon* spp.-*Dichanthium secundum* grassy understorey on the drainage floors and small areas of cracking clay plains.

The Dampier botanical district, is a region in which a great thickness of gently folded sedimentary rock, of Palaeozoic and Mesozoic age, overlies a Precambrian basement of crystalline rock. The basement outcrops along the north and east of the basin.

The up-land regions consist of low hills and stony plains with granite domes, gneiss hills, schist ridges and gently sloping sandy plateaus. The vegetation formations consist of low open woodland formations of *Eucalyptus* species with a hummock grassland ground layer. The main alliance of *E. brevifolia* is represented by a number of associations. One noteworthy association is *Grevillea pyramidalis*. The hummock grassland layer consists of the genera *Triodia* and *Plectrachne* in almost pure stands of species. A short grass ground storey with *Enneapogon* and *Aristida* may be seen on the interfluvies and hill-foot slopes to the south-east. The drainage floors usually carry low open woodland formations of *E. dichromophloia* and *E. tectifera* alliances. The grass layer includes the genera *Chrysopogon*, *Sehima*, *Sorghum* and *Dichanthium*.

Rocky limestone areas and shallow calcareous soils are characterised by *Triodia wiseana* hummock grassland. The *Adansonia gregorii* open woodland association is largely restricted to rugged limestone country, although *A. gregorii* may be found associated with other species, e.g. with *E. dichromophloia* and *E. perfoliata* (Twinleaf Bloodwood) on granite tors or domes to the north. *E. dichromophloia*, *Grevillea striata* and *Lysiphyllum cunninghamii* low open woodland alliances occur on the outcrop plains over the gently folded sandstone, shale and limestone. These may be linearly oriented along strike lines and associated with *Acacia*, *Atalaya*, *Ventilago* and *Dolichandrone*. Cracking clay plains on the sedimentary rocks carry tussock grasslands of *Astrebla*, *Dichanthium* and *Chrysopogon*. The tributary alluvial plains of the Fitzroy River consist mainly of *Grevillea striata* and *Lysiphyllum cunninghamii* low woodland with *Triodia* and *Chrysopogon*. The stable and active flood-plains carry *Astrebla* and *Chrysopogon*-*Dichanthium* tussock grasslands, with *Acacia suberosa* as an important associate, and *E. papuana* and *E. microtheca* woodland alliances. Lining the main channels are *E. camaldulensis*-*Terminalia platyphylla* fringing communities. Coastal flats have fringing mangrove forests. Open grasslands of *Xerochloa* spp. occur on the margins of saline influence.

The Dampier botanical district contains extensive areas of sand plains which lack surface drainage. The dominant layer in the vegetation is composed of *Acacia*, the more important species being *A. tumida*, *A. eripoda*, *A. pachycarpa*, *A. holosericea* and *A. monticola*. *E. dichromophloia* and *E. zygophylla* make up the tallest stratum of the low woodland formation containing these *Acacia* species. Other tree genera include *Gyrocarpus*, *Atalaya*, *Hakea*, *Grevillea*, *Lysiphyllum*, *Persoonia* and *Erythrophleum*, with the occasional *Adansonia*. In the high rainfall area, a woodland formation of *E. miniata* alliance is present. This alliance also has a strong layer of *Acacia* shrubs. In this district *E. tetradonta* is not associated with *E. miniata* as it is in the Gardner botanical district. The grass ground storey is predominantly *Plectrachne pungens*-*Chrysopogon* spp. Shallow valleys, pans and depressions, which may be up to five kilometres wide, carry woodlands of *E. polycarpa*, *E. tectifera*, *E. microtheca* and *Melaleuca* spp. alliances, with various tall grasses. The saline coastal flats carry *Sporobolus virginicus* and *Arthrocnemum* spp. communities.

The Eremaean Province, which lies between the predominantly summer and predominantly winter rainfall patterns of the north and the south-west, respectively, is intermediate in character. The rainfall, which over most of the province is less than 400 mm per annum, is received either from extensions of summer rainfall southward or from northern extensions of the southern winter systems. The vegetation of the province varies from woodland, high shrubland, low shrubland to hummock grassland. Eleven botanical districts have been broadly recognised, seven of them in the desert area.

The Fortescue botanical district, usually placed in the Northern Province, consists of the Pilbara block. This district is intermediate in character between the Northern and the Eremaean Provinces. It consists of granite plains to the north and west, rising gently inland to a capping of basalt in the Chichester Range and beyond this to the dolomite and jaspilite of the Hamersley Range. The vegetation of the narrow coastal strip carries grasslands of *Eragrostis* and *Eriachne* and low open shrublands of *Acacia translucens*-*A. inaequilatera* alliance. *Acacia pyrifolia* high open shrubland alliance is present on granite and basalt soils. The *Acacia* alliances have a strongly developed *Triodia pungens* hummock grassland ground layer. The high shrubland and low woodland *A. aneura* alliance is found along the major valleys and southern flanks of the Hamersley Range. A sparse shrub layer and a short grass ground flora composed of *Eragrostis* (Love Grass), *Eriachne* (Wanderrie Grass) and *Aristida* characterise these communities. On the Proterozoic rocks of the Hamersley Range the characteristic vegetation is a low open woodland formation, with *E. leucophloia* alliance. The hummock grassland ground layer found on stony soil consists mainly of *Triodia wiseana* and *T. basedowii*. Low woodland formations of *E. dichromophloia*-*E. setosa*, with *Triodia basedowii* as ground cover, occur on the sand plains. *E. camaldulensis*-*Melaleuca leucadendron* fringing communities line the permanent pools of the Fortescue River. Coastal flats have fringing mangrove scrub.

The Ashburton and the Austin botanical districts are separated by the prevailing rainfall patterns. The former, with its rainfall more likely to occur in summer, and the latter, with its rainfall more likely to occur in winter, both carry extensive low woodland and high shrubland formations of *A. aneura* alliance but, whereas the northern alliance is associated more with grass genera such as *Aristida*, *Eragrostis*, *Eriachne*, *Panicum*, *Brachiaria*, *Triodia* and *Setaria*, the southern alliance is associated more with genera such as *Danthonia*, *Eremophila*, *Maireana*, *Bassia*, *Helipterum*, *Cephalopterum*, *Velleia*, *Swainsona* and other herbaceous annuals. The *A. aneura* alliance consists of a number of sub-alliances and associations. These include the *A. aneura*-*Eremophila leucophylla*, *A. aneura*-*E. fraseri*, *A. aneura*-*A. tetragonophylla*, *A. aneura*-*A. craspedocarpa*, *A. aneura*-*A. sclerosperma*, *A. aneura*-*A. linophylla*, *A. aneura*-*Callitris huegelii*, *A. xiphophylla*-*A. grasbyi* and *A. sclerosperma*-*A. ramulosa* sub-alliances. *E. kingsmillii* is also associated with *A. aneura*, and with a hummock grassland ground layer. *Maireana pyramidata* is associated with *A. aneura* on saline alluvial

plains. Other woody genera that are prominent in the *A. aneura* alliance are *Hakea*, *Grevillea*, *Atriplex*, *Frankenia*, *Plagianthus*, *Heterodendron* and *Brachychiton*. The upper margins and floors of pans and salt lakes in the Austin district carry an *Arthrocnemum* spp. alliance. Fringing these flats are *Melaleuca uncinata* communities. The drainage channels are fringed by *E. camaldulensis* and *E. coolabah* (Coolibah) alliances.

The Carnarvon botanical district, a sedimentary basin in which the exposed surface rocks range from Permian to Recent in age, is mostly low-lying. The vegetation on the northern plains consists of *Acacia xiphophylla* high open shrubland with *Triodia basedowii* as ground cover. On the sand plains the vegetation is predominantly *Acacia pyrifolia* open shrubland, with scattered *Owenia reticulata*, and with *Triodia pungens* and *Plectrachne schinzii* as ground cover. On Cape Range *E. dichromophloia* low open woodland, with *Triodia pungens* and *T. wiseana*, is to be seen. *Acacia* species such as *A. coriacea*, *A. ramulosa*, *A. sclerosperma*, *A. xiphophylla*, *A. tetragonophylla*, *A. grasbyi* and *A. ligulata* form high open shrubland or low open woodland communities with shrub species of other genera over a wide area of this botanical district. On alluvial flats the low shrub understorey layer consists of species of *Maireana* and *Atriplex*. *Arthrocnemum* low open shrubland occupies the wetter sites. On Kennedy Range a mixed open shrubland with *Triodia basedowii* and *T. pungens* as ground cover is present.

The Canning, Mueller, Kertland, Carnegie, Giles and Helms botanical districts comprise what was once called the Carnegie botanical district. These make up the desert region of Western Australia.

The Canning and Mueller districts contain extensive areas of high shrubland with several species of *Acacia* dominating. On the sandy plains the dominant species is *A. pachycarpa* with *Triodia pungens* as ground cover. Scattered trees of *Eucalyptus* sp. (Desert Bloodwood) are present on the dunes. *Owenia reticulata* (Desert Walnut) is the principal low tree species in the north-western sector. *E. pachyphylla* and *E. odontocarpa* are prominent in the north-eastern sector, while woodlands of *Casuarina decaisneana* are also of local importance there, in the interdunes. The ground layer of hummock grassland includes *Triodia* and *Plectrachne*. *Grevillea wickhamii* and *Acacia monticola* are dominant on stony rises. Low trees of *E. pruinosa*, *E. brevifolia*, *E. setosa* and *E. coolabah* occur at a very low density.

The Kertland district has a noticeable abundance of *Thryptomene maisonneuvei* and other Myrtaceae in the high shrubland formation. The Desert Bloodwood is present on the dunes, together with *Plectrachne schinzii*. *A. aneura* is of local importance, on small hills and mesas, with *Triodia pungens*. Hills of igneous rocks are covered with *Plectrachne melvillei*.

The Carnegie district carries extensive areas of *A. aneura*, with *Danthonia* and seasonal ephemerals. On the rises of the lateritic plains hummock grasslands of *Triodia basedowii* and high shrublands with *E. kingsmillii* merge in with the *A. aneura* which tend to thin out. Desert Bloodwood, *Casuarina decaisneana*, and *E. coolabah* become more local in distribution, while *Plectrachne schinzii* is increasingly replaced by *Thryptomene maisonneuvei* southwards.

The Giles district consists of ranges with sandhill country between them, somewhat similar to the Carnegie district. *Casuarina decaisneana* groves are very common in sandhill country between the ranges. *Triodia basedowii* and *Plectrachne schinzii* provide ground cover. On the ranges the high shrubland is made up predominantly of *Acacia* spp. including *A. aneura*, with *Eremophila*, *Hakea*, *Grevillea* and *Eucalyptus* as co-dominants in some areas. *Callitris columellaris* is locally dominant. *Triodia basedowii* and *Plectrachne melvillei* form the hummock grassland ground layer. The *A. aneura* alliance, prominent on basalt soils, has a ground flora of seasonal ephemerals and scattered *Eremophila* and *Cassia*.

The Helms district contains extensive areas of *A. aneura* alliance. A high shrubland formation characterised by *E. youngiana* alliance is also well developed. Associated with the shrubland community are other tall shrubs such as *Hakea*, *Acacia*, *Melaleuca*, *Grevillea* and



other *Eucalyptus* species. Patches of open woodland of *E. gongylocarpa* are restricted apparently to areas where the sand is deeper. The hummock grass associated with *E. youngiana* and *E. gongylocarpa* is *Triodia basedowii*.

The *Eucla* botanical district, commonly referred to as the Nullarbor Plain, is dominated by a low shrubland formation of *Maireana sedifolia*. *Atriplex*, *Stipa* and seasonal ephemerals are well represented. Towards the margin a low open woodland of *Acacia sowdenii* alliance, with a shrubland understorey of *Maireana* and *Atriplex*, becomes more and more evident. To the north this is replaced by a low woodland made up of *Acacia aneura*, *Casuarina cristata* and *Myoporum platycarpum*. Along the coastal strip low woodlands of *E. socialis*, *E. gracilis* and *A. sowdenii* alliances are to be seen on the ridges and flats, respectively. A *E. transcontinentalis*-*E. flocktoniae* woodland alliance found in the extreme south-western portion forms a continuum with a similar formation in the Coolgardie botanical district.

The *Coolgardie* botanical district marks the transition from the South-West Province to the Eremaean Province, from the *Eucalyptus* zone to the *Acacia* zone. In this district a high degree of variability occurs within *Eucalyptus* and *Acacia*. It is thought that this variability may have been due to climatic oscillations known to have occurred since the Pleistocene period, thus making many of the 'species' of recent origin. The vegetation is a mosaic of woodland and shrubland formations. The woodland formations include *E. salmonophloia*, *E. transcontinentalis*-*E. flocktoniae*, *E. torquata*-*E. lesouefii*, *E. dundasii*-*E. longicornis*, *E. brockwayi* and *Acacia aneura* alliances. Shrubland formations include *Grevillea eriostachya*-*G. didymobotrya*-*G. excelsior*, *Eucalyptus foecunda*, *E. eremophila* and other mallee or shrub eucalypts, *Acacia* spp.-*Casuarina* spp.-*Melaleuca* spp. and *Acacia aneura* alliances. Salt lakes and salt pans are associated with halophytic communities of *Arthrocnemum* and *Atriplex* alliances.

The *South-West Province*, which receives its rainfall in winter and has a warm to cool temperate climate, has a high degree of endemism in its flora. The degree of endemism is most powerfully expressed in the cusps of its triangular-crescentic area particularly in the high shrubland and heath formations found to the north of the Hill River and to the east of the Fitzgerald River. Large areas of this province have been altered greatly by man and contain a high proportion of the naturalised alien species recorded in the State.

The *Darling* botanical district consists of four subdistricts. The *Warren* subdistrict, which occupies the extreme south-western corner of Western Australia, has an annual rainfall in excess of 1,200 mm. The main vegetation formations are the high open forest, on granite soils represented by *E. diversicolor* alliance; open forest on lateritic soils represented by *E. marginata*-*E. calophylla* alliance; low forest and scrub of *Agonis flexuosa* on extensive coastal dunes; also on sand dunes, heaths, with *Jacksonia horrida*-*Acacia decipiens*; and sedgeland of *Evandra aristata*-*Anarthria* spp. in waterlogged areas. Seasonally flooded areas may also carry a *Melaleuca preissiana* low forest alliance. Small patches of *E. cornuta* woodland are to be seen on dune sands. Other species associated with the alliances include *E. jacksonii* and *E. guilfoylei* with *Banksia grandis*, *B. littoralis*, *Casuarina decussata*, *Agonis flexuosa* and *A. juniperina* as understorey trees and a dense high shrub layer of *Trymalium*, *Chorilaena*, *Hovea elliptica*, *Acacia pentadenia*, *Albizia* and *Pteridium*, (in *E. diversicolor* alliance) and *E. patens*, *E. megacarpa* and *E. rudis* with *Banksia grandis*, *B. littoralis*, *Casuarina fraserana*, *Persoonia longifolia*, *P. elliptica*, *Nuytsia floribunda* and *Xylomelum occidentale* as understorey trees and a low shrub heathlike groundlayer (in *E. marginata*-*E. calophylla* alliance).

The *Menzies* subdistrict marks the transition from the Warren subdistrict, with its high rainfall, to the Dale subdistrict where the annual rainfall for the most part scarcely exceeds 600 mm. The vegetation is predominantly *E. marginata*-*E. calophylla* open forest, merging eastwards into *E. wandoo* and *E. cornuta* woodlands.

In the *Drummond* subdistrict the narrow strip of Recent or Pleistocene sand dunes carry scrub or low forests of *Agonis flexuosa* alliance at the southern edge, with *Acacia rostellifera*-*A. cyclops*-*A. cochlearis* alliance and sand dune complex over most of its length. Inland and

parallel to the coastal dune system is a narrow belt of coastal limestone hills, the natural habitat of the *E. gomphocephala* woodland alliance. This alliance has an understorey tree layer of *Banksia grandis* and *Agonis flexuosa*, with a sparse shrub layer. The greater part of the Perth basin is mantled with aeolian sands. The northern sector carries a low forest formation of *Banksia menziesii*-*B. attenuata*-*Casuarina fraserana*-*E. todtiana* alliance, with a heath understorey, and smaller areas of *B. prionotes* alliance; the southern part is dominated by a *E. marginata*-*E. calophylla* open forest or woodland alliance, with a heath understorey, and smaller areas of *Banksia* low forest. Poorly drained swampy areas carry *Casuarina obesa* low forest alliance; *Actinostrobus pyramidalis* (Swamp Cypress Pine) is of local significance. Swamp and fen formations are made up of complex communities of sedgeland. Watercourses in the district are fringed by a *E. rudis*-*Melaleuca* spp. alliance.

The Dale subdistrict occupies the laterite capped plateau dissected by young streams to form steep-sided valleys. An open forest formation of *E. marginata*-*E. calophylla* alliance characterises the lateritic erosional and deep depositional surfaces, with *E. wandoo* alliance restricted to the heavier pediment soils. The understorey layers of the *E. marginata*-*E. calophylla* alliance resemble those in the same alliance in the Warren district. The *E. wandoo* understorey layer has a more open character. This alliance, which in its most highly developed state fringes the eastern boundary of this district, is more widely distributed in the Avon botanical district.

The Irwin botanical district, for the most part, overlies sedimentary rocks from Silurian to Quaternary age, with smaller areas of Precambrian metamorphics. This district forms one of the two floristically important cusps of the South-West Province. At the northern extremity, the Irwin district consists of red and yellow sands underlain by Mesozoic sediments. The high shrubland formations are made up of mixed high shrubland with a heath understorey, with mainly Proteaceous and Myrtaceous elements, *Acacia* spp.-*Casuarina acutivalvis* and *Melaleuca* spp. and *Hakea* spp. scrub alliances. Low woodlands of *Banksia menziesii*-*B. attenuata*, *B. ashbyi*-*B. sceptrum*, *B. prionotes* and *Actinostrobus arenarius* occur on deep sands. Heath and low heath formations of Proteaceae, Myrtaceae, and Leguminosae occur in areas where the sand is shallow or where a lateritic crust is present. These formations vary considerably in floristic composition.

On the metamorphic rocks, the vegetation on residual flat tops and plateau surfaces carries low forests of *B. prionotes* alliance with heath on the lateritic surfaces. A low woodland formation of *E. loxophleba*-*Acacia acuminata* alliance dominates the loamy valley soils, now extensively used for farming. This alliance is associated with a herbaceous ground layer composed of *Stipa*, *Neurachne* and seasonal ephemerals. *E. salmonophloia* alliance is significant only in the eastern part of the district.

The vegetation of the coastal dune system is an extension of the Darling district. The limestone hills in the Irwin district carry low woodlands of *E. erythrocorys*. Poorly drained areas and small lakes carry or are fringed by *Casuarina obesa* and *E. rudis*-*Melaleuca* spp. alliances.

The central to southern portions of the Irwin district are characterised by the so-called 'sand plains'. These carry low woodlands of *Banksia menziesii*-*B. attenuata*-*E. todtiana* and *B. prionotes* alliances particularly on the deeper sands. *E. lanepolei* (Salmonbark Wandoo) and *E. accedens* (Powderbark Wandoo) are of local significance, on heavy clay soils. In areas of deep dissection, the valleys carry woodlands of *E. wandoo* and *E. calophylla* alliances. Heath and low heath formations cover most of the elevated regions. The heath communities vary in composition, depending upon the depth of sand and the presence of laterite, and some may eventually develop into high shrubland communities with long-term fire protection. Proteaceae, Myrtaceae and Leguminosae are dominant components, while on laterite hills *Xanthorrhoea reflexa* and *Dryandra* spp. become very conspicuous. *Banksia hookerana* alliance is locally sig-

nificant north of the Arrowsmith River. High shrubland communities with *Grevillea eriostachya*-*G. didymobotrya*-*G. eriostachya*, *Lambertia multifloras* (Native Honeysuckle) and *Actinostrobilus arenarius* alliances are also significant in the sandplain region.

The Avon botanical district, which covers most of the so-called wheat belt, is now for the most part cleared of native vegetation for farming.

On the eastern edge of the Darling district, on the low hilly to hilly terrain, with hard acidic yellow mottled soils, the pediments of early erosional cycles, the woodland formation consists of *E. wandoo* alliance. *E. marginata*-*E. calophylla* alliance occurs on soils which tend more to ironstone gravels with a sandy matrix. The *E. wandoo* alliance is associated with *E. accedens*, and with *E. astringens* which commonly occur on lateritic breakaways. In the southern portion *E. gardneri* (Blue Mallet) and *E. falcata* (Silver Mallet) are more commonly seen on the breakaways, while *E. cornuta* woodland alliance replaces the *E. wandoo* woodland alliance. The *E. wandoo* woodland has a very open low shrub layer. Poisonous plants of the genera *Gastrolobium* and *Oxylobium* are commonly seen in this woodland formation. On granite outcrops, a vegetation complex reflects the succession of colonisation by algae and lichen to shrublands with *Leptospermum* and eventually to climax communities of woodland of *Casuarina huegeliana* alliance, which occur on sandy or gritty soils over one metre in depth.

On the hard neutral red soils of the river valley systems, which represent further erosional cycles, the woodland formation is represented by the *E. loxophleba* alliance, with *Acacia acuminata* as its main associate. *A. acuminata* tends to merge with the *E. wandoo* alliance, particularly as the soils become sandy or gritty. In the southern portion *E. occidentalis* alliance replaces the *E. loxophleba* alliance. *E. occidentalis* woodlands occur also on the clay soils of swamps or seasonal shallow lakes.

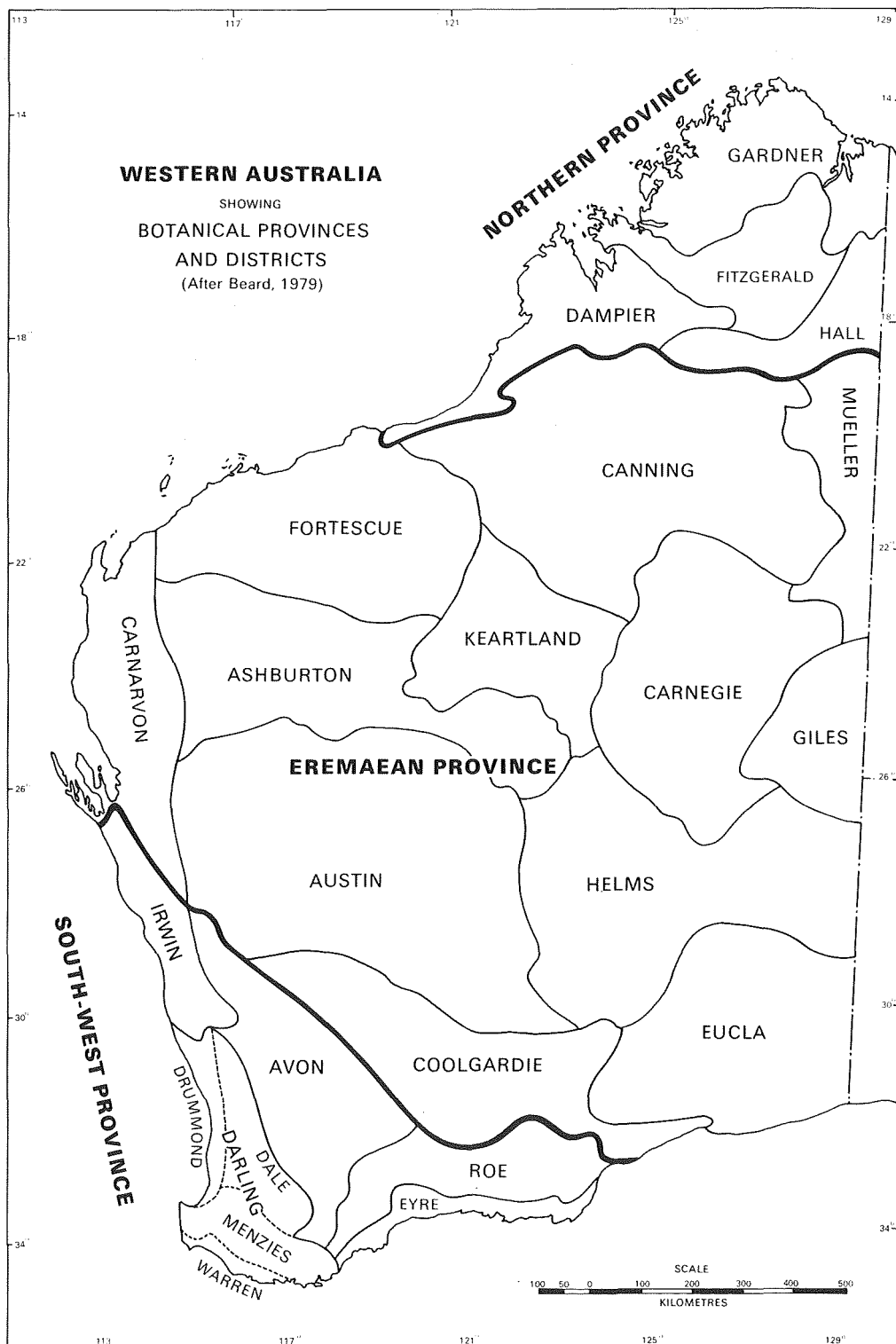
Extensive areas of *E. salmonophloia* woodland alliance are found in the hard alkaline yellow soils further to the east, on valley plains and terraces. *E. salmonophloia* woodland has an open mixed low shrub understorey with *Maireana* and *Atriplex* dominating in more saline soils. Other trees associated with this alliance are *E. salubris* (Gimlet), *E. longicornis* (Red Morrel) and *E. melanoxydon* (Black Morrel).

Forming a mosaic with the woodland formations are the low woodland and shrubland formations developed on the plateau areas, on sandy yellow earths containing ironstone gravel and over mottled or pallid-zoned clays. The *B. prionotes* woodland alliance and *Acacia* spp.-*Casuarina* spp.-*Melaleuca* spp. and *Grevillea eriostachya*-*G. didymobotrya*-*G. leucopterys* shrubland alliances occur on yellow sand. *Dryandra* spp. and mixed Myrtaceae, Proteaceae, Leguminosae and Epacridaceae heath alliances occur on laterite or shallow sand over laterite. Other shrubland formations include *E. eremophila* (Tall Sand Mallee), *E. oldfieldii* (Oldfield's Mallee), *E. drummondii* (Drummond's Gum), *E. pyriformis* (Pear-fruited Mallee) and other mallee or shrub eucalypt alliances. *E. macrocarpa* (Mottlecah) shrubland occurs on deep sand.

The salt lakes, remnants of once extensive river systems, carry *Casuarina obesa* and *Melaleuca* spp. low woodland alliances on the fringes with low shrubland formations of *Arthrocnemum* spp. alliance in the old watercourses. *E. sargentii* (Salt River Gum) and *E. kondininensis* (Kondinin Blackbutt) grow on saline soils.

The Eyre botanical district, which includes the Stirling and Mount Barren Ranges, forms the second of the two floristically important cusps of the South-West Province. It lies at the edge of the Archaean Shield where it abuts into the Proterozoic metamorphics of the Albany-Esperance block. The latter consists largely of sediments of middle and late Eocene age, at one time mantled by a lateritic crust, which is represented in the present landscape by narrow ironstone gravel ridges and erosional scarps along the northern edge.

The Stirling and Mount Barren Ranges which rise abruptly out of an otherwise predominantly undulating landscape are composed of hard Proterozoic metasedimentary



rocks. The ranges carry closed heath and scrub formations of mixed Myrtaceae, Proteaceae, Leguminosae and Epacridaceae alliance. They are noted for their diversity in the flora and their conspicuous endemic or near endemic species. Woodlands of *E. marginata*-*E. calophylla*, *E. wandoo* and *E. cornuta* occur on the lower slopes and valleys of the Stirling Range.

Over a large area of the Eyre district, the vegetation is made up of high shrubland formations with shrub or mallee eucalypts dominating. *E. tetragona*, *E. redunca*-*E. uncinata*, *E. gardneri*-*E. nutans* and *E. eremophila*-*E. oleosa* alliances form a mosaic over the area, the former on the undulating upper slopes and rises nearer the coast. Patches of mixed heath and low heath of Proteaceae, Myrtaceae and Leguminosae are present. The heath vegetation merges into and forms the understorey of the high shrubland communities. Low forests of *E. platypus*-*E. gardneri*-*E. falcata* alliance occur locally on scarp slopes. To the east *E. tetragona* alliance gives way to *E. tetragona*, while on the sandy soils *Banksia speciosa*-*Lambertia inermis* and *Nuytsia floribunda* become dominant.

Woodland formations of *E. occidentalis*, *E. loxophleba* and *E. salmonophloia* alliances occur along drainage lines and loamy slopes and flats. The former alliance is favoured by higher rainfall and winter wet sites and is often seen on or around clay pans. Salt lakes are covered by or fringed by low shrubland formations of *Arthrocnemum* spp. and *Atriplex* spp. alliances. A scrub formation of *Melaleuca* spp. alliance may also be present.

The littoral fringe of the coastal plain is made up of a chain of granite bosses with drift sand between them. *Acacia rostellifera*-*A. cyclops*-*A. cochlearis* and *Agonis flexuosa* scrub alliances are present with the sand dune and granite lithic complexes. *Banksia baxteri* and *B. attenuata*, as well as *Lambertia inermis* (Chittick), are dominant on the drift sand, inland, with *E. marginata* and *E. cornuta*, the former found to the west, the latter restricted to interdunal flats. Coastal swamps carry a *Melaleuca* spp. alliance. The islands of the Recherche Archipelago carry low forests of *E. cornuta* and *E. lehmannii* as well as mixed scrub and heath formations.

The Roe botanical district contains a number of plant communities found in the adjacent Eyre, Avon and Coolgardie districts. On residual sandplains there are extensive areas of mixed heath. These merge into *E. eremophila*-*E. oleosa* and *E. redunca*-*E. uncinata* tall shrublands. *E. forrestiana* (Fuchsia Mallee) is present in these alliances. Further to the east, on limestone, the tall shrubland is dominated by *E. cooperana* (Many-flowered Mallee). Patches of *E. falcata* and *E. gardneri* occur on higher ground, particularly to the west. *E. platypus* low forest is found in pockets on clay soils, *E. salmonophloia* and *E. occidentalis* woodlands are seen in the valleys, the former to the north, the latter mainly to the south.

The salt lakes carry *Arthrocnemum* spp. low shrubland communities. These are fringed by *Melaleuca* spp. low woodland or shrubland communities. The dominant species are *M. lateriflora* and *M. uncinata*.

### Naturalised Flora

The naturalised flora of Western Australia which now makes up so much of the landscape of the South-West Province is composed of elements from many parts of the world. These plants have in some instances been deliberately introduced, others have been introduced by accident. Some species have been introduced on more than one occasion and several variants may be present. The more successful species originate from areas of similar climate, and in the absence of disease and insect attack, which in their native habitat would keep them in check, are able to disseminate at an alarming rate. South Africa and the Mediterranean Region provide most of the successful alien species found in the South-West Province.

Grasses of importance are represented by the genera *Bromus* (Brome Grass), *Lolium* (Rye Grass), *Hordeum* (Barley Grass), *Avena* (Oats), *Aira* (Silver Grass), *Briza* (Blowfly Grass), *Poa* (Winter Grass), and *Vulpia* (Silver Grass) from Southern Europe, and *Eragrostis* (Love Grass), *Ehrharta* (Veldt Grass) and *Rhynchelytrum* (Red Natal Grass) from South Africa. Pasture

legumes from southern Europe include *Trifolium* (Clover), *Medicago* (Medic, Lucerne), *Lupinus* (Lupin), *Ornithopus* (Serradella), *Vicia* (Vetch) and *Lotus* (Birdsfoot Trefoil). *Psoralea pinnata* (African Scurf Pea) from South Africa is a shrubby weed.

The weed flora of Western Australia is composed largely of alien species. Very few native species have become weeds in this State. The ubiquitous composite *Arctotheca calendula* (Cape Weed) originates from South Africa, as do *Arctotis*, *Berkheya*, *Osteospermum*, *Gorteria*, *Cotula* and *Ursinia*. Naturalised European composites include *Carthamus* (Saffron Thistle), *Hypochoeris* (Flat Weed), *Carduus* (Slender Thistle), *Dittrichia* (Stinkwort), *Lactuca* (Lettuce), *Conyza* (Fleabane), *Centaurea* (Cockspur Thistle) and *Cirsium* (Spear Thistle). The Brassicaceae, significant as crop weeds, comprise *Raphanus* (Radish), *Brassica* (Turnip), *Rapistrum* (Turnip Weed) and *Sinapis* (Charlock). *Carrichtera annua* (Ward's Weed) is widely naturalised in the Eucla district. All these are of European origin. The South African Iridaceae are represented by genera such as *Homeria* (Cape Tulip), *Watsonia*, *Gladiolus*, *Moraea*, *Ixia* and *Sparaxis* and were introduced in the first instance as garden subjects. *Echium* (Paterson's Curse) (Boraginaceae) was another garden introduction, while *Rubus* (Blackberry) (Rosaceae), a woody species, was introduced for its fruit. *Oxalis* (Soursob) (Oxalidaceae), from South Africa, is common in vineyards and orchards, while the family Polygonaceae is represented by *Rumex* (Dock) and *Emex* (Double Gee), weeds of wide habitat. The latter, introduced as a spinach from South Africa, is now extremely widely distributed in the South-West and Eremaean Provinces. Also widely distributed but more localised in occurrence is *Argemone* (Mexican Poppy) (Papaveraceae), with origins in North America. *Prosopis* (Mesquite) (Mimosaceae) and *Parkinsonia* (Cesalpiniaceae) from the Americas, and *Calotropis* (Asclepiadaceae) from Africa, are weedy shrubs or small trees naturalised in the tropics.

In addition to the naturalised alien species which now exceed 700 in number, there are hundreds of species of plants under cultivation in Western Australia. These include field crops (cereals, legumes, fibre and oil seeds), horticultural plants (fruit, vegetables and garden subjects) and forest trees. Other species are being deliberately introduced for particular purposes, e.g. the reclamation of waste land and saline areas.

As Man's activities further impinge upon the natural ecosystems and as more and more alien plants become naturalised in this State, so will the effect of these plant species be more widely felt in the natural environment. It is essential to have information on the biology of alien species so that proper management measures can be applied to maintain harmony within our natural ecosystems.

#### FURTHER SOURCES OF INFORMATION ON THE VEGETATION AND FLORA OF WESTERN AUSTRALIA

- APLIN, T. E. H. *The Flora in Environment and Science* (Ed. Brian J. O'Brien). University of Western Australia Press, Nedlands, 1979.
- ASTON, H. I. *Aquatic Plants of Australia*. Melbourne University Press, Carlton, 1973.
- BEARD, J. S. (ed.). *West Australian Plants*. 2nd ed. Society for Growing Australian Plants, Sydney, 1970.
- BEARD, J. S. *Vegetation Survey of Western Australia 1 : 250,000 series*. Vegmap Publications, Sydney, 1969 — continuing.
- BEARD, J. S. *Vegetation Survey of Western Australia 1 : 1,000,000 series*. University of Western Australia Press, Nedlands, 1974 — continuing.
- BEARD, J. S. *Vegetation Survey of Western Australia series*. University of Western Australia Press, Nedlands, 1974 — continuing.
- BEARD, J. S. *Phytogeographic Regions in Western Landscapes* (Ed. J. Gentilli). University of Western Australia Press, Nedlands, 1979.
- BENTHAM, G. *Flora Australiensis*. Reeve, London, 1863-78.

- BLACK, J. M. *Flora of South Australia*. 2nd ed. Government Printer, Adelaide, 1943-57.
- BLACKALL, W. E. and GRIEVE, B. J. *How to Know Western Australian Wildflowers*. Parts 1-3. University of Western Australia Press, Nedlands, 1956-65.
- BURBIDGE, N. T. *Dictionary of Australian Plant Genera*. Angus and Robertson Pty. Ltd., Sydney, 1963.
- CHIPPENDALE, G. M. *Eucalypts of the Western Australian Goldfields (and the adjacent wheatbelt)*. Australian Government Publishing Service, Canberra, 1973.
- Commonwealth Scientific and Industrial Research Organization. *Land Research Series*, Nos. 4, 7, 9, 28, 1960-70.
- Department of Agriculture. Botany Branch and Western Australian Herbarium publications, various.
- Department of Agriculture, Soils Division. Rangeland Management Branch publications, various.
- EICHLER, H. J. *Supplement to Black's Flora of South Australia*. Government Printer, Adelaide, 1965.
- ERICKSON, R. *Triggerplants*. Paterson Brokensha, Perth, 1958.
- ERICKSON, R. *Orchids of the West*. 2nd ed. Paterson Brokensha, Perth, 1965.
- ERICKSON, R. *Plants of Prey in Australia*. Lamb Paterson, Perth, 1968.
- ERICKSON, R., GEORGE, A. S., MARCHANT, N. G. and MORCOMBE, M. K. *Flowers and Plants of Western Australia*. Reed, Sydney, 1973.
- GARDNER, C. A. 'The Vegetation of Western Australia'. Presidential Address, 1942. *J. Roy. Soc. W. Aust.*, vol. 28, 1949, pp.11-87.
- GARDNER, C. A. 'Trees of Western Australia'. Reprinted from *J. Agric. W. Aust.* 1952-66.
- GARDNER, C. A. 'Gramineae'. *Flora of Western Australia*, vol. 1, pt 1, Government Printer, Perth, 1952.
- GARDNER, C. A. *Wildflowers of Western Australia*. 11th ed. West Australian Newspapers Ltd., Perth, 1973.
- MORCOMBE, M. K. *Australia's Western Wildflowers*. Landfall, Perth, 1968.
- Nuytsia*. Bulletin of the Western Australian Herbarium, Western Australian Department of Agriculture, South Perth, 1970 — continuing
- RIDE, W. D. L. and others. *National Parks and Nature Reserves in Western Australia*. Government Printer, Perth, 1966.
- SEDDON, G. *Sense of Place. A Response to an Environment: The Swan Coastal Plain, Western Australia*. University of Western Australia Press, Nedlands, 1972
- SMITH, G. G. *A Guide to the Coastal Flora of South-Western Australia*. Handbook No. 10 of the Western Australian Naturalists' Club. Perth, 1973.
- SPECHT, R. L. 'Vegetation' chapter in *The Australian Environment*. 4th ed. C.S.I.R.O. — Melbourne University Press, Melbourne, 1970.
- SPECHT, R. L., ROE, ETHEL M. and BOUGHTON, VALERIE H. 'Conservation of Major Plant Communities in Australia and Papua New Guinea'. *Aust. J. Bot. Supp. Series*, Supp. No. 7, 1974.
- Vegetation Survey of Western Australia series*. Western Australian Department of Agriculture, South Perth, 1972 — continuing.

## Chapter II— continued

### Part 4—The Fauna of Western Australia

Contributed by

W. D. L. Ride (former Director of the Western Australian Museum)  
and

D. L. Serventy (former Officer-in-Charge, W.A. Station, C.S.I.R.O., Division of Wildlife Research)

#### DISTRIBUTION

##### Terrestrial Vertebrates

An observer who looks carefully at the fauna of a large land mass like the Australian continent will soon discover that its animals are not distributed uniformly throughout it. He will find that groups of species which are characteristic of some places are missing from others. This is because the distribution of animals results both from their response to the physical (*i.e.* ecological) conditions of their environment (and these are not uniform from place to place), and from their past histories. For example, the presence of routes along which a species could have moved in the past, and of barriers which would have made its movement from one place to another impossible, decide whether any species could have reached a particular locality by today. But whether it has persisted there until today depends upon local conditions having been suitable for it.

The relationship between the distribution of a species and the character of its environment may be demonstrated dramatically and most easily by comparing the distribution of animals with that of climate, and in particular with its components of temperature, rainfall and the time of the year at which rain falls. In Western Australia many species lie within one or other of the boundaries of two rather different climatic regions. These are the south-west with its regular and plentiful rainfall during cold winters, and the Kimberley with regular, plentiful rainfall during hot summers. The remainder of the State receives intermittent and unreliable rainfall in quantities which vary widely; some parts of this area (*e.g.* the Pilbara) receive their small amount of rain principally in the summer and other parts (*e.g.* the Nullarbor) in the winter.

An analysis of most of the Western Australian groups of vertebrate animals shows that they can be referred to three faunal assemblages characteristic of these climatic regions. These assemblages are called *faunas* and have been named by zoogeographers *Bassian* which, in this State, is the fauna characteristic of the south-west; *Torresian* which, in this State, is characteristic of the Kimberley; and *Eyrean* which is the fauna which occupies the land between. While the composition of a fauna is, generally speaking, characteristic of the area in which it occurs, the occurrence of a particular species in a fauna does not mean that it will not be found in another because each of the faunas has several elements which are sufficiently wide in their requirements for them to occur as 'foreigners' in the faunas of neighbouring regions. Examples of these are the species with predominantly Torresian populations (and apparently histories of origin) which are found today in the otherwise Eyrean fauna of the Pilbara district of the north-west; and various Eyrean species which occur in the Bassian fauna of the south-west.

Among the birds the sharpest faunal break is between the Torresian fauna of the Kimberley division and the Eyrean fauna of the Pilbara. The Kimberley is the headquarters in Western Australia of the Scrub Fowl (*Megapodius freycinet*), the Fruit Pigeons (Ptilinopinae), Lorikeets (*Trichoglossus* and *Psitteuteles*), the White Cockatoo (*Cacatua galerita*) and most of the Grass Finches. The Torresian species which penetrate further southwards include the Brolga (normally only to Onslow), White-breasted Wood Swallow (to Shark Bay), and the Brown Honeyeater (right through to the south-west).



Among mammals there seem to be a few truly Torresian species in Western Australia. Examples would be the Fruit Bats or Flying Foxes (*Pteropus* and *Macroglossus*), the Little Rock Wallaby (*Peradorcas concinna*), the Jungle or River Wallaby (*Macropus agilis*) and the Antelope Kangaroo (*Macropus antilopinus*). On the whole most of the mammal species which occur in the Kimberley seem to be characteristic of that part of the Eyrean fauna inhabiting the country which receives intermittent rainfall during the summer.

Even among birds, the boundary between the majority of the Eyrean species and the bulk of the Bassian species is less well defined than that which separates Eyrean and Torresian faunas as there is a good deal of overlapping. For example, the line which separates the woodland eucalypts and the mulga, the so-called 'mulga-eucalypt line', is the extreme limit of most Bassian species, though many do not range inland beyond a line connecting Geraldton, Moora, Northam and the Stirling Range. The mulga-eucalypt line separates, to quote an example, the main distributions of the Grey Kangaroo (Bassian) and the Red Kangaroo (Eyrean). This line is the northern limit of other well known Bassian species such as the Red Wattle Bird.

The south-west of the State has representatives of many well known Bassian species also found in south-eastern Australia. These include among birds, the Brush Bronzewing, White-tailed Black Cockatoo, Western Rosella, Scarlet Robin, Yellow Robin, Southern Emu-Wren, Silvereye, White-naped Honeyeater, Western Spinebill, New Holland Honeyeater and Red-eared Firetail. Among mammals there are the Pigmy Possum, the Wambenger, the Grey Kangaroo, the Tammar Wallaby, the Brush Possum and various dunnarts (marsupial mice, *Sminthopsis*). Among frogs there are various *Crinia* and *Heleioporus inornatus* and *australiacus*; and fishes such as *Galaxias* and *Nannoperca*. However, there has been an extensive intermingling of Eyrean and Bassian elements in the south-west on a scale not paralleled in south-eastern Australia. In the south-west we have a blend of faunas in the sclerophyll forests which, though essentially Bassian in character, contain such Eyrean intrusives as the Purple-crowned Lorikeet, the Twentyeight Parrot, the Rufous Tree-creeper, the Western Warbler, the Banded Blue Wren and the Red-tipped Diamond-bird.

It must be recognised also that the distribution of animals that we see today may be a very recent pattern, and subject to continual fluctuation. Studies of fossil pollen in the south-west suggest there have been fluctuations in the relative abundance of jarrah, marri and karri trees over the last few thousand years. Even more marked fluctuations in vegetation may have been produced by climatic changes accompanying glaciation and deglaciation in high latitudes and altitudes over the past two million years. Marked changes in vegetation would usually be accompanied by changes in fauna. We know that the Marsupial Wolf or Tiger (*Thylacinus*), the Koala (*Phascolarctos*) and other marsupials, some of them now extinct throughout their ranges in Australia, once lived in the south-west, and it is possible that climatic changes were responsible for their vanishing from that area of Western Australia.

Climatic alterations, on a minor scale, are constantly going on. In the past half-century, or longer, there has been a considerable change in northern Europe, Asia and America, an amelioration in some parts and a drying-up in others, with widespread effects on the distribution of animals. Something similar appears to have been taking place in Western Australia. Many dry-country bird species, of the Eyrean faunal assemblage, have made notable extensions of range into the south-west corner. These include the Galah, Little Corella, Budgerygah, Smoker Parrot, Crested Pigeon, Black-faced Woodswallow, Crested Bell-bird, Blue-and-white Wren, Black-throated Butcher-bird and Little Crow. The records of local naturalists, who keep district lists of local birds and mammals over a period of years, are very useful sources of data for plotting these changes. Frequent Museum surveys will provide more positive information.

In some cases distribution changes due to natural causes may be masked or modified through the alterations of habitat due to settlement. These habitat changes act to the detriment of woodland birds but favour open-country species (like pipits and plovers).

### Coastal Marine Fauna (1)

The nature of the coastal waters varies from the warm mangrove-lined mud flats of the north to the clean sandy bays and cool crystal-clear waters of the south. The types of coastal marine habitats depend on the range of tide, the exposure to oceanic swells, the sediments carried off the land by wind or river and some local biological activities such as reef coral or algal building. There is a gradual change in water temperature, salinity and other physical characteristics of the sea as one moves along the long Western Australian coastline of 12,500 kilometres; these changes reflect the nature of the adjacent water mass modified by local effects such as occur in large and small embayments, near river mouths or behind protecting headlands. The coastal waters may be divided into the following broad zones:

1. North: from the Western Australian-Northern Territory border to Cape Leveque with very broken coastline, a high tidal range, high runoff from well vegetated hinterland and no exposure to heavy oceanic swell.
2. North-north-west: from Cape Leveque to Cape Keraudren with eighty miles of low beach, a high tidal range, little regular runoff from desert sands which are blown into the sea by the 'South-East-Trades'.
3. North-west: from Cape Keraudren to North West Cape with an indented coastline, moderate tidal range, irregular runoff from some mountains and desert sands.
4. West-north-west: from North West Cape to Kalbarri with some high cliffs, a deep embayment (Shark Bay), moderate tidal range, irregular low runoff from little vegetated desert hinterland and exposure to the south-west oceanic swell. A barrier coral reef, unique in Western Australia, runs southward from North West Cape for nearly 160 kilometres.
5. West-south-west: from Kalbarri to Cape Naturaliste with fairly smooth low white sandy coastline and some limestone headlands; rainfall moderate with little runoff from coastal sands, water clear; tidal range low, offshore coastal reefs give some protection to the coast from the south-west swell.
6. South-west: from Cape Naturaliste to Israelite Bay with broken headland and surf beach formations, high south-west swell exposure, low tidal range, many inlets and low-volume river discharges.
7. South-east: from Israelite Bay to the Western Australian-South Australian border with smooth coastal outline of beaches and some cliffs, modified exposure to south-west swell, low tidal range and low rainfall runoff.

Certain coastal marine areas are special in the sense that they represent either a transition (*i.e.* rapid change of character) between two adjacent zones or possess unique features found in such combinations nowhere else on the coast. Examples of such special places are the coastal waters in the Broome to Derby region, around North West Cape, in Exmouth Gulf, in Shark Bay, the Perth metropolitan beaches (including Cockburn Sound), around Cape Naturaliste and around Cape Leeuwin.

The islands and reefs off the coast are also regarded as special because of their marine faunal peculiarities; for example, the Houtman Abrolhos, the Monte Bellos, the Rowley Shoals, the North West Cape Barrier Reef and the Archipelago of the Recherche.

The marine fauna of the north coast is distinct from that of the south coast although a few species do occur in both regions. The northern fauna is regarded as part of the Indo-West Pacific fauna, and the southern fauna of Western Australia as part of the southern Australian fauna. Some species of both these faunas extend and overlap along the west coast and there are several species which are endemic to this region only. One of these is the Western Australian commercial rock lobster *Panulirus cygnus* and another is the Western Australian commercial jewfish *Glaucosoma hebraicum*.

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(1) Written in collaboration with Dr R. W. George.

### Fauna of Inland Waters <sup>(2)</sup>

The inland waters are of many types and possess very varied faunas. They may be divided into four main ecological groupings: (1) the rivers of the Kimberley Division; (2) the river systems of the north-west from the De Grey to the Murchison; (3) the streams, swamps, and lakes of the south-west corner; and (4) the temporary waters of the dry inland represented by two widely different habitats, (i) freshwater claypans and soaks (including man-made dams) and (ii) the salt lakes.

Marked seasonality characterises river flow in the Kimberley Division because of the alternation of regular summer rain with winter drought. The river pools and many isolated springs support an extensive fauna of fish, insects, molluscs and other animals, many of which show close affinities with the aquatic fauna of Asia and the Indo-Malay Archipelago.

The rivers of the north-west from the De Grey to the Murchison flow only intermittently, and between times of flood the fauna must survive in widely separated spring-fed pools in river beds. These pools, like those at Millstream Station on the Fortescue River, are often of striking beauty. Their fauna is relatively sparse as compared with the richer assemblages in the Kimberley rivers, the most conspicuous elements being a few fish species and a freshwater tortoise (*Chelodina steindachneri*) which is confined to the region.

The permanent hill streams of the south-west have a diverse arthropod fauna. Most of these are insects but, in addition, there are several species of freshwater crayfish in slower-running parts — Marron (*Cherax tenuimanus*) occur in permanent streams of deep water; Jilgie (*C. quinquecarinatus*) in shallow permanent water; Koonac (*C. preissi*) make burrows in the mud of swamps. A species of a closely related group, the so-called 'land crabs' (*Engaewa*), has been recently discovered in the swamps of the south-west. The freshwater mussel *Westralunio carteri* is confined to the streams of the south-west. Most rivers stagnate and may become saline in summer; they are reduced to chains of large or small pools to which the fauna is restricted. The small transparent prawn *Palaemonetes* is often abundant in these pools. Shallow permanent lakes and swamps near the coast also have a fairly varied insect fauna, among which certain species of dragonflies are particularly abundant; at times there are enormous numbers of *Daphnia* and related small crustaceans.

The inland freshwater claypans are characterised by an interesting ephemeral fauna, mainly of phyllopod Crustacea. The most conspicuous is the large shield shrimp (*Triops australiensis*) but a variety of fairy shrimps (Anostraca and Conchostraca) occur also. The eggs of these creatures survive for years in the dried mud and development is rapid when the claypans fill after occasional rains.

The most conspicuous animals in the waters of the salt lakes are the brine shrimps (*Artemia* and *Parartemia*), which at times build up to such high population densities as to attract large flocks of Banded Stilts, which breed only in certain of the inland salt lakes. The Salt Lake Snails *Coxiella* reach their greatest diversity and abundance in the south-west saline lakes.

### THE COMPOSITION OF THE FAUNA

The fauna of Western Australia includes representatives of all major phyla of the Animal Kingdom and individuals range in size from the Blue Whale (*Balaenoptera musculus*), the largest mammal that has ever lived, to minute single-celled protozoa which cannot be seen without a microscope. No estimate can be made of the number of species, and probably the number of species of insects alone out-numbers all the rest by a comfortable margin. Here we have not attempted to describe all phyla. The vertebrates are given fairly full treatment because they are obvious and familiar animals to most of us. The insects (mostly those of economic importance) are dealt with in Part 5 of this Chapter, and the remaining phyla are treated in a few paragraphs which confine themselves to groups of interest.

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<sup>(2)</sup> Written in collaboration with Dr E. P. Hodgkin.

## THE VERTEBRATE FAUNA

**Mammals**

Unlike the birds and reptiles, wild mammals are not frequently seen in most parts of Western Australia. This is because most of the species are small and secretive and appear only at night. However, there are exceptions and, as any traveller in inland and northern parts of the State can attest, kangaroos of one species or another can often be seen in large numbers during daylight hours.

Most species of mammals have distinct ecological preferences which allow them to be categorised into one or other of the three main faunal groups which are described earlier in this Part under the heading *Distribution*. For example, in the kangaroo family, the Tammar Wallaby (*Macropus eugenii*), the Quokka (*Setonix brachyurus*), and the Brush Wallaby (*Macropus irma*) are found only in the south-west or on certain isolated islands off the coast. Of these, the Brush Wallaby is closely related to the South Australian Toolache Wallaby (*Macropus greyi*) and the Tammar to the Flinders Island Wallaby and the now extinct St Peter Island Wallaby of South Australia. The most familiar kangaroo of the dry country with unreliable rainfall is the Red Kangaroo or Marloo (*Megaleia rufa*), while in the summer-rainfall country of the Kimberley Division we find such species as the Jungle Kangaroo or River Wallaby (*Macropus agilis*), the Little Rock Wallaby (*Peradorcas concinna*) and the Northern Nail-tailed Wallaby or Karrabul (*Onychogale unguifera*). In addition to the species which sort out in this convenient way, there are others which are widely distributed and in fact occur as members of all three faunal assemblages. The most familiar members of the family which do this are the Euro or Biggadda (*Macropus robustus*), the Boodie (*Bettongia lesueur*), and the Rock Wallaby (*Petrogale penicillata*). Of these, the Euro may still be found anywhere in suitable local habitats from the Kimberley to the south-west and inland across the South Australian border. At one time this was true also of the Boodie and the Rock Wallaby which, however, are today unfortunately absent from much of their former range.

So far, only the kangaroos have been mentioned but, in fact, representatives of all three major divisions of the mammals (*i.e.* monotremes, marsupials and placentals) occur in the State.

The egg-laying monotremes are represented by the Echidna (*Tachyglossus aculeata*), sometimes called Spiny Anteater or Porcupine. This curious and completely inoffensive animal is not uncommon in the country around Perth and it even appears on occasions in densely-settled suburban areas. In drier districts, its diggings, made in its search for insects, are familiar around rocky hills and breakaways.

Marsupials, or pouched mammals, occur in great variety in Western Australia. The kangaroos and wallabies, already mentioned, are the herbivorous members of the group. These animals are the Australian evolutionary equivalent of the antelopes, deer, and horses of the other continents and there is often an extraordinary similarity in structure between members of the kangaroo family and these other herbivores. These similarities extend even to such details as the physiology and shape of the stomach and other organs of digestion. The reproductive systems of marsupials and their physiology have also long been of great interest to biologists because they differ from those of other animals. For example, it is now known that in the Quokka, and some other wallabies, the adults mate again immediately after the birth of the 'joey'. The embryo which is the product of the second mating does not develop immediately but is held in a dormant state in the female system. However, if the first young joey is lost from the pouch, this dormant embryo immediately begins to develop and a second joey is produced after a minimum period of time.

In Western Australia the kangaroos and wallabies are all terrestrial (there are no tree kangaroos), and even their arboreal relatives, the phalangerids, are few in number as compared with other parts of Australia. The Brush Possums, the Pigmy Possums and the Ring-tails have Western Australian representatives, but the Koalas and the striped Possums are absent, and of

the four species of flying possums of eastern Australia only one (*Petaurus breviceps*) occurs in Western Australia and that only in the Kimberley Division. Although the species of possums in Western Australia are few in number, there are some unique forms which are of great interest. One of these is the rare Scaly-tailed Possum (*Wyulda*) of the Kimberley; unlike other Australian possums this animal has a hairless scaly tail and only twelve specimens of it are known. There is also the curious and rarely-seen Honey Possum (*Tarsipes*) of the south-west. Wombats are known to have occurred in Western Australia around the turn of the century and were thought to be extinct until a small colony was rediscovered in 1965 near Caiguna in the Eucla Division.

Although the large carnivorous marsupials no longer live in the State, the smaller representatives of this group are still fairly common. There are two separate species of native-cats, a southern species (*Dasyurus geoffroii*) and a northern one (*Dasyurus hallucatus*), as well as many species of smaller carnivorous and insectivorous forms. One of the smaller members of this family, the Dibbler (*Antechinus apicalis*), one of our least-known marsupials and last recorded in 1884, was rediscovered during 1967 at Cheyne Beach near Mount Manypeaks on the south coast.

The remaining group of marsupials is that commonly called the bandicoot family. One of these, the Pig-footed Bandicoot (*Chaeropus ecaudatus*) is probably the State's rarest mammal, but it once occurred in the Nullarbor region where its remains have recently been discovered in caves and two living specimens of it were collected by John Gilbert in 1841 some miles to the north-east of Northam. No confirmed record has been made of the species in Western Australia since then. On the other hand another species of bandicoot, the Quenda, or Short-nosed Bandicoot (*Isodon obesulus*), is one of the commonest of marsupials. Its scratchings are common in country gardens and the little animal is often run over and found dead on roads. It lives largely on insects and, being nocturnal, it is seldom seen but it is nevertheless very common in many areas in the south-west.

The third main group of mammals is that of the higher mammals or placentals. Animals of this group occur in Western Australia in addition to the marsupials and the monotremes, and it always comes as something of a surprise to visitors (who generally have a strong preconception of Australia as a land in which all but introduced mammals and the Dingo are pouched mammals and monotremes) to learn that there are many species of Western Australian native placental mammals. In fact, if the seals, whales, and Dugong which occur around our coasts be counted, the species of native placental mammals outnumber the marsupial and monotreme species.

The composition of the mammal fauna is shown in the following table.

Kinds of wild mammals	Number of species occurring in Western Australia (a)	Kinds of wild mammals	Number of species occurring in Western Australia (a)
Monotremes	1	Introduced placentals —	
Marsupials	60	Rodents	5
Native placentals —		Land carnivores	2
Bats	23	Ungulates (Horses, Deer,	
Rodents	24	Camels, etc.)	9
Marine mammals:		Rabbits	1
Seals (b)	2		—
Dugong	1		—
Whales	22		—
Land carnivores—Dingoes	1	TOTAL, ALL SPECIES	151
	73		—

(a) Total numbers of species are from *A Guide to the Native Mammals of Australia* by W. D. L. Ride. (b) Only resident seals are counted. Antarctic seals are occasionally 'shipwrecked' on southern coasts but these are clearly stragglers into the area.

Within Western Australia the best-established groups of native placental mammals, *i.e.* the bats and rodents, are distributed in much the same ecological manner as are the marsupials; some are dry country forms like *Leggadina hermannsburgensis*, the small mouse which builds mounds of pebbles on stony ridges<sup>(1)</sup>, others are predominantly animals of the wet tropics like the majority of the Fruit-bats or Flying Foxes (*Pteropus* and *MacroGLOSSUS*), while yet others are confined to the country of reliable winter rainfall in the south-west, *e.g.* the Southern Bush-rat (*Rattus fuscipes*). These native placental mammals are of great zoological interest because some of them, and in particular the native rats and mice, have been here for many millions of years and closely parallel (in adaptation to our stringent ecological conditions) their relatives in similar places in other lands. Thus, we have hopping-mice (*Notomys*), like miniature kangaroos, which are very similar in appearance and habits to the jumping-mice (Zapodidae) of the American and Eurasian dry-lands, and the jerboas (Dipodidae) of Africa; but it must be emphasised that the jumping specialisations of our own hopping-mice have evolved quite independently within Australia.

Some of our native placental mammals have been economically important. Until 1963 a shore-based Western Australian fishery at Carnarvon depended upon the migrating groups of Humpback Whales (*Megaptera novaeangliae*) which move along the western coast between their feeding grounds in Antarctic waters and their breeding places in the tropics. Until late 1978 another whale fishery, at Albany, operated upon Sperm Whales (*Physeter catodon*). The humpback fishery collapsed because of immoderate exploitation which so reduced the population that it was in danger of extinction. The sperm whale fishery ceased operations following a decision by the company on economic grounds; in addition stock analyses have shown that over-exploitation of the Sperm Whale also has been occurring. No whaling is now permitted within the 200-mile zone as a result of a policy decision by the Commonwealth Government based on recommendations from a judicial inquiry. The catching of Southern Fur-seals (*Arctocephalus doriferus*), formerly lucrative, is now no longer permitted. The Dugong (*Dugong dugon*) was once an important source of food for the natives of the coastline from Shark Bay to the Northern Territory. The Dingo (*Canis familiaris dingo*) has probably not been in Australia for as long as the other native mammals, and may well have entered with the Australoid people who were ancestral to our present Aborigines. In some parts of the State the Dingo is a major problem to the pastoral industry because of its attacks on livestock.

The preceding table also shows that there is a large number of introduced species as well as native mammals. These are now a part of the wild mammal fauna of Western Australia and all are placentals. Some of these species are also agricultural and pastoral pests and they have become so well entrenched in the environment that there is no doubt that any discussion of the mammalian fauna of the State must take them into account and mention should be made of some of them here. Red Deer (*Cervus elephus*) occur spasmodically in the south-west around Pinjarra, Waroona and Harvey. Camels (*Camelus dromedarius*) occur in large numbers and are distributed through the Eastern Goldfields up through the Pilbara and into the Kimberley. They have been declared vermin around Laverton, Nullagine, Port Hedland and Halls Creek. Donkeys (*Equus asinus*) have a distribution very much like that of the camel and also occur generally throughout the Kimberley. Wild goats (*Capra hircus*) are ubiquitous in dry country but are mainly concentrated in the Murchison and the north-west. A small herd of Black-buck (*Antelope cervicapra*) occurs near Geraldton. Rabbits (*Oryctolagus cuniculus*) are widespread in Western Australia but are only of economic significance south of the Murchison. They are by no means the problem they used to be, mainly because of programmes of intensive rabbit extermination. Foxes (*Vulpes vulpes*), declared vermin, are also widespread but do not commonly occur north of the De Grey River, having only been reported spasmodically from the Kimberley Division. The domestic cat run wild (*Felis catus*) occurs

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<sup>(1)</sup> It is suspected that these may be dew-traps.

commonly in the bush and is an efficient predator on native fauna. It became feral in the early days of settlement and soon spread throughout the Colony. The naturalist Kearland while a member of the Calvert Scientific Exploring Expedition in 1896, recorded that 'in the desert of north-west Australia' he saw a tabby cat at least 400 miles [644 kilometres] from the nearest house. Earlier still the ornithologist Tom Carter writing in 1887 from the Carnarvon district spoke of 'the domestic cat, which is found quite wild and of a large size all through the colony'.

Examination of the composition of the older mammal fauna of Western Australia, *i.e.* monotremes, marsupials, bats and native rodents, as set out in the following table, reveals that only one-eighth of all species recorded from the State today appear to occur only in Western Australia. The south-west contains by far the greatest number of endemic species.

ENDEMISM OF NATIVE MAMMALS TO WESTERN AUSTRALIA  
(excluding marine mammals)

Group	All endemic and non- endemic species	Number of endemic species			
		Total endemics	Endemics north of Fitzroy River	Endemics of South-West Land Division	Endemics of remainder of State
Monotremes	1	—	—	—	—
Native cats	23	5	1	2	2
Marsupial moles	1	—	—	—	—
Bandicoots	7	—	—	—	—
Possums	8	2	1	1	—
Wombats	1	—	—	—	—
Kangaroos and Wallabies	20	4	—	3	1
Rats	24	3	—	2	1
Bats	23	—	—	—	—
Dingoes	1	—	—	—	—
Total	109	14	2	8	4

### Birds

The bird fauna of Western Australia consists of a selection of the species occurring in eastern Australia, with only a very minor development of endemic forms. All of these latter, except one (the Western Australian King Parrot, *Purpureicephalus spurius*), have a close and obvious affinity to other Australian forms. The quantitative relationship of the Western Australian bird fauna to that of Australia as a whole is indicated in the following table, which has been prepared on an ecological basis.

BIRD FAUNA

Description	Number of breeding species		Number of non-breeding visiting migratory species	
	Western Australia	Australia	Western Australia	Australia
Local birds	307	499	6	8
Inland water birds	51	52	33	42
Sea birds	25	38	33	55
Total	383	589	72	105

Representatives of most of the families and genera of Australian birds occur in this State. Notable absentees include the Cassowary (*Casuarius casuarius*), Brush Turkey (*Alectura lathami*), several of the fruit-pigeons, the Crimson Rosella (*Platycercus elegans*), Lyre-bird (*Menura novaehollandiae*), several honeyeaters including the Regent (*Zanthomiza phrygia*), Apostle-bird (*Struthidea cinerea*), Cat-birds (*Ailuroedus*), Satin Bower-bird (*Ptilonorhynchus violaceus*) and Rifle-birds (*Ptiloris*).

Space is insufficient to detail all the forms occurring in Western Australia. Mention may be made only of some distinctive species and groups which are common and widely distributed.

The Emu (*Dromaius novaehollandiae*) is still numerous all over the State and is occasionally encountered in the Darling Range near Perth. Australia's only breeding species of penguin, the Fairy Penguin (*Eudyptula minor*), nests on islands off the southern and south-western coasts as far north as Carnac near Fremantle. The Mallee-fowl or Gnow (*Leipoa ocellata*) is still plentiful and, after a period of decline during which its disappearance was feared, it is now increasing in abundance. All of the widespread species of Australian quails occur but owing probably to the scarcity of natural grasses in the south are not individually very numerous. Among the pigeons two species have shown notable recoveries in population strength. After a long period of scarcity the Common Bronzewing (*Phaps chalcoptera*) began a cycle of increase about 1936 and is still very abundant. The rare Flock Pigeon (*Histriophaps histrionica*) of the more arid country of the north-west and the far north has declined all over Australia and had not been recorded in this State since 1927 until 1958 when considerable flocks were observed in the Hamersley Range and the Fortescue River country. It has also reappeared in parts of the Kimberley Division.

A very distinctive member of the rail family is the Black-tailed Native Hen or Gallinule (*Tribonyx ventralis*). It is a creature of the drier country but is subject to violent fluctuations in numbers, when it is liable to invade the south-west in great strength. A famous occasion was in May 1833 when it overran the settlers' fields and gardens around Perth and did considerable damage to the crops. Similar irruptions took place in 1853, 1886, 1897 and 1919. Later invasions, such as those in 1952 and 1964, have been on a much more modest scale. Of the three Australian grebes the most plentiful is the Hoary-headed Grebe (*Podiceps poliocephalus*) which assembles in the winter in big flocks on the southern estuaries, including that of the Swan River.

In the petrel group there are five breeding species in local waters. The most numerous is one of the mutton-birds, the Wedge-tailed Shearwater (*Puffinus pacificus*) which nests on most islands between Carnac in the south and Sable Island, in the Dampier Archipelago, in the north. A second mutton-bird, the Fleshy-footed Shearwater (*P. carneipes*) nests between Cape Leeuwin and the Archipelago of the Recherche; it is a migratory species and in the winter months migrates to the north-western sector of the Indian Ocean. A similar trans-equatorial migrant is the White-faced Storm-petrel (*Pelagodroma marina*), a diminutive form rarely observed at sea. It nests often in vast aggregations on islands off the south coast and as far north as the Abrolhos. All of these species nest in the spring and summer months. The remaining two breed in the winter. The Great-winged Petrel (*Pterodroma macroptera*) shares the nesting islands off the south coast with the Fleshy-footed Shearwater in a sort of 'Box and Cox' relationship. The black and white Little Shearwater (*Puffinus assimilis*) has a wider nesting range, from the Recherche to as far north as the Abrolhos; in former times it nested at Parrakeet Island off Rottnest Island. In the winter months some twenty-two species of southern-breeding petrels visit local seas. They vary in size from the little Wilson Storm-petrel (*Oceanites oceanicus*), barely larger than a swallow, to the great Wandering Albatross (*Diomedea exulans*). The Wilson Storm-petrel 'winters' all along the Western Australian coast to the tropics and is a familiar sight around fishing boats in Shark Bay. The most common of the albatrosses is the Yellow-nosed Albatross (*Diomedea chlororhynchos*) and may be seen as far north as Point Cloates. The most familiar of these visitors is the dusky Giant Petrel (*Macronectes giganteus*). Ringing experiments have demonstrated that the birds seen here are first-year individuals making circumpolar flights round the Southern Hemisphere; marked birds found in the south-west had been ringed a few months previously in their nests at Heard Island, Macquarie Island, and islands in the South Orkneys in the South Atlantic.

All of the five species of Australian cormorants or shags occur locally. Despite complaints of their depredations on commercially important fish, investigations have cleared the birds of blame, though one species, the Black Cormorant (*Phalacrocorax carbo*), specifically identical



with the Cormorant of Europe, does occasionally include edible fish in its diet. One marine species, the Pied Cormorant (*P. varius*), which enters the Swan River estuary and Peel Inlet, is mainly responsible for the guano deposits on the coastal islands. Deposits at Shark Bay were commercially exploited in the last century and at one stage, in 1850, a detachment of troops was stationed at The Quoin Bluff, Dirk Hartog Island, to ensure the collection of royalties. Pelicans in Western Australia, unlike those in eastern Australia, breed only on coastal islands and not on inland waters. Until recently the nearest breeding place to Perth, and presumably the origin of most of the Swan River Pelicans, was Pelican Island, Shark Bay. However, since 1962 a breeding colony has become established at Peel Inlet, Mandurah.

Fourteen species of terns are recorded for the southern parts of the State and three more for the Kimberley Division. Three of the seventeen are migrants from the Northern Hemisphere and ringed individuals of the European Common Tern (*Sterna hirundo*) and the Arctic Tern (*S. macrura*), marked in northern Europe, have been recovered near Fremantle. These birds must have reached our coast via the Cape of Good Hope. The Silver Gull (*Larus novaehollandiae*) is noteworthy for having two breeding seasons in the southern part of the State. On the islands at Safety Bay, for example, there is an egg-laying peak in the autumn and another in the spring.

The numerous Order of wading or shore-birds (sandpipers, dotterels, and plovers) includes a few locally-breeding species but the majority are migrants from the Northern Hemisphere, where they breed in the tundra zone of northern Asia. Though they frequent ocean beaches and estuaries, as well as swamps and lakes, they are listed in the category of 'inland water birds' in the table at the beginning of this section. Some twenty-five species of these birds, commonly called 'snipe' (though the true Snipe of eastern Australia, *Gallinago hardwickii*, does not occur in this State) migrate to Western Australia. In addition there are sixteen species of this Order which breed in Australia. One of them, the Red-capped Dotterel (*Charadrius alexandrinus*), is virtually identical with the rare Kentish Plover of England. Here it is very common and nests at Pelican Point on the Swan River. Another local breeder is the remarkable Banded Stilt or Rottneet Snipe (*Cladorhynchus leucocephalus*) which is an attractive inhabitant of the salt lakes of Rottneet Island. However, it nests only on the inland salt lakes. The nesting habits remained long unknown until colonies were discovered at Lake Grace and Lake King in 1930.

The Australian Bustard ('Wild Turkey', *Eupodotis australis*) is a magnificent bird which has been largely exterminated by shooters over much of south-eastern Australia and in the developed south-west of this State. It is not uncommon in sparsely-settled areas and individuals occasionally appear on the open coastal country quite near Perth. It has recently been demonstrated by ringing that the Straw-necked Ibis (*Threskionis spinicollis*) ranges between south-western Australia and northern and eastern Australia. Fledglings marked in the nests at Muchea have later been taken in the North-West, the Kimberley Division, Arnhem Land and near Orange (New South Wales).

The Brolga (*Grus rubicunda*) is a northern bird normally found as far south as Onslow, but some individuals may wander into the outer parts of the south-west as occurred in 1952. In the heron family a new bird has been added to the State list — the Cattle Egret (*Bubulcus ibis*), which appears to have colonised northern Australia from Indonesia and has now spread over much of eastern and Western Australia.

There are eighteen species of swans and ducks occurring in the State, one of the most remarkable, perhaps, being the Cape Barren Goose, which is now restricted to the islands of the Archipelago of the Recherche. Recent leg-ringing experiments have shown that the common and widespread Grey Teal (*Anas gibberifrons*) wanders indiscriminately all over Australia, its movements being influenced by availability of surface waters.

Though the Black Swan (*Cygnus atratus*) occurs all over Australia, and in fact is more plentiful in some of the other States, historical reasons give it a peculiar association with Western Australia. The bird was first recorded by Europeans in this State, by Antonie Caen, skipper of

the Dutch ship 'Banda' in July 1636 off the north-west coast. The first specimens were captured on the Swan River by Willem de Vlaming in January 1697 and taken alive to Batavia, whence they astonished the scientific world. Vlaming named the river after them, and the first colonisation in 1829 was known as the Swan River Settlement. The bird became the emblem of the Colony and State, with the motto, *Cygnus insignis*. The birds do not, and probably never did, occur in the broadwaters of the Swan River estuary, but in the shallows at Lucky Bay and above Heirisson Island. During the 1890s the authorities imported birds from elsewhere in the State, and even from Victoria, and set them free, pinioned, in Perth Water, where they were an attraction in Mounts Bay when the old men's home was located near there.

The State is also well provided with hawks and eagles, twenty-four species being found within its limits. Most are harmless economically and the few that do take chickens and lambs are not serious depredators, though there is controversy on the role of the Wedge-tailed Eagle (*Aquila audax*) which is, however, classified by the Agriculture Protection Board as vermin in certain districts in the central and north-west portions of the State.

There are not as many species of the parrot group in Western Australia as there are in eastern Australia but one species, the Western Australian King Parrot or Red-capped Parrot (*Purpureicephalus spurius*), is restricted to the south-west and has no near relatives elsewhere. The Twentyeight Parrot is a form of the Port Lincoln Parrot (*Barnardius zonarius*) and is common almost everywhere, being regularly present in Kings Park, a natural reserve adjacent to the City of Perth.

The Kookaburra (*Dacelo gigas*), so common in the forests of the south-west, is not a Western Australian native but was introduced from eastern Australia by the Acclimatisation Board during January 1897. A similar species, however, the Blue-winged Kookaburra (*D. leachii*) occurs in the north, as far south as the Wooramel River. The Rainbow-bird (*Merops ornatus*) in the south is a strict migrant, arriving regularly in the first week in October. Local birds migrate to the north of the State, the wintering area being from the Gascoyne River northward, but some individuals cross the Timor Sea to the Indonesian islands. There are eleven cuckoo species in our area, the commonest being the Pallid Cuckoo (*Cuculus pallidus*) whose plaintive insistent note is heard soon after the winter rains set in.

In the great group of passerines, or song-birds (Order Passeriformes), the most celebrated is the Noisy Scrub-bird (*Atrichornis clamosus*), a primitive almost-flightless bird which until recently was believed to be the only Australian bird which had become extinct since white settlement. The last specimen was collected by the ornithologist A. J. Campbell at Torbay in 1889, but late in 1961 a surviving population was discovered at Two Peoples Bay east of Albany. Space is insufficient to deal in any detail with other members of this large Order. Throughout the State there are 172 species, of which 95 occur in the southern settled parts and at least 33 are found in Kings Park. A distinctive robin, the White-breasted Robin (*Eopsaltria georgiana*), occurs in the south-west. It is a relative of the yellow robins and is found in the dense coastal and forest thickets from Geraldton southward and east to Albany and the Porongurups. The Western Warbler (*Gerygone fusca*) is a sweet-voiced songster which may be heard in the street trees of Perth, the only Australian capital city in which it lives; in the other States the bird is an inland species. Another distinction of the Perth metropolitan area is that four species of blue-wren, a greater number of species than in the environs of any other capital city, have been noted there. One species, the Red-winged Wren (*Malurus elegans*), which used to live near the city, disappeared when Herdsman Lake was drained. The remaining species are the Splendid Wren (*Malurus splendens*), occasionally still seen in the University grounds; the Blue-and-white Wren (*Malurus leuconotus*) in the coastal dune scrubs, and the Causeway and Pelican Point samphire flats; and the Variegated Wren (*Malurus lamberti*) in the dune thickets. Honeyeaters are numerous, the largest, the Red Wattle-bird (*Anthochaera carunculata*), being a familiar bird in metropolitan streets and gardens. Most of the grassfinches are restricted to the Kimberley Division, where ten species are found. However, one of them,

the widespread Zebra Finch (*Taeniopygia castanotis*), nests as near to Perth as Northam and York. Two bower-birds occur in the State. The Great Bower-bird (*Chlamydera nuchalis*) is confined to the Kimberley Division, but the Spotted Bower-bird (*C. maculata*) is found in the north-west and ranges south to the East Murchison country and Malcolm in the Eastern Goldfields.

In contrast with all other Australian States there are very few species of exotic birds established in Western Australia. (The same is true of the Northern Territory.) In the towns of the south-west two turtle doves are plentiful, the Indian (*Streptopelia chinensis*) and the Senegal (*S. senegalensis*). The Goldfinch (*Carduelis carduelis*), an escapee from aviaries, breeds freely in the Perth metropolitan area and around Albany. Recently another cage-bird escapee, the Red-browed Finch (*Aegintha temporalis*), an eastern Australian species, has established itself east of Kalamunda in the Darling Range near Perth. The Indian or Ceylon Crow (*Corvus splendens*) repeatedly arrives at Fremantle on ships from the Orient but the vigilance of officers of the Department of Agriculture and port officials has led to the successful eradication of the unwanted immigrants. The House Sparrow (*Passer domesticus*) has been similarly kept at bay at Fremantle. This species did, however, make a temporary colonisation, from South Australia, in the vicinity of Eucla and Mundrabilla in 1917-18 but it failed to make any headway and disappeared from there.

### Reptiles

In Western Australia the reptiles are represented by three major zoological groups or Orders. These are the Chelonia (four marine species of turtles and six of freshwater tortoises). Crocodilia (two of crocodiles) and the Squamata (sixty-two species of snakes and 159 of lizards).

The freshwater tortoises of Western Australia, like those of the rest of the continent, belong to the ancient group of side-necked tortoises. In most other parts of the world tortoises retract their heads straight backwards bending their necks in a vertical S-shaped curve. Australian tortoises, and certain others from South America, bend their necks sideways; this is believed to be an ancient character. Although the species of Western Australian tortoises are few, they are of great interest and their distributions are far from well understood. This is especially true of the species inhabiting the Kimberley. Freshwater tortoises do not seem to fall into simple faunal zone classifications. The common long-necked tortoise of the south-west, *Chelodina oblonga*, is closely related to the long-necked tortoise of the Kimberley Division, *Chelodina rugosa*. However, neither of the short-necked tortoises of the Kimberley Division, *Emydura australis* and *Elseya dentata*, is represented in the south-west. The river systems from the Irwin, in the Northern Agricultural Division to the De Grey in the northern Pilbara, have their own tortoise (*Chelodina steindachneri*), while a highly specialised short-necked tortoise (*Pseudemydura umbrina*) is apparently confined to a few square kilometres of winter swamps between Upper Swan and Bullsbrook to the north of Perth. Because of its vulnerability to extinction this last species is rigidly protected.

Marine chelonians also occur in large numbers around the coasts. The Green Turtle (*Chelonia mydas*), the species which is used for soup making, comes ashore to lay its eggs on the northern beaches. Attempts have been made in the past to exploit this species commercially but it is now protected. However, a non-profit organisation has been granted a licence on behalf of a group of Aborigines in the Kimberley region to take a specified number of eggs and day-old hatchlings. These will be raised by the Aborigines at a commercial turtle farm at One Arm Point, north of Broome. A certain proportion will be liberated so that the wild stock will not be depleted.

Snakes and lizards are common and widespread throughout the State, and in numbers of obvious individuals they are probably surpassed among the vertebrates only by the birds. In the south-west, Bobtails (*Trachysaurus rugosus*) can often be seen crossing the roads at most times of the year, while the walker among coastal sand dunes on warm days cannot avoid

noticing innumerable small dragon-lizards which move away from in front of him. In the southern part of the State the largest lizard which is at all common is the Goanna (*Varanus gouldi*). These are frequently between 0.9 and 1.2 metres in length. In northern areas the Perentie (*Varanus giganteus*) exceeds it in size. A few species are confined to the south-west and of these the most interesting are Mueller's Snake (*Rhinoplocephalus bicolor*), the Little Brown Snake (*Elapognathus minor*), the Black-Striped Snake (*Vermicella calonota*) and the Slender Snake Lizard (*Pletholax gracilis*) which is also one of our rarest species of lizard. An Eyrean species which never ceases to surprise the visitor is the terrible-looking Mountain Devil (*Moloch horridus*). This lizard is actually one of the most gentle and harmless of animals and lives exclusively on ants.

The snake fauna of the State is diverse and, like that of other parts of Australia, contains many venomous species, the best known being the Tiger Snake (*Notechis scutatus*), the Dugite (*Demansia affinis*), the Gwardar (*D. nuchalis*), the Death Adders (*Acanthophis antarcticus* and *A. pyrrhus*) and the Mulga Snake (*Pseudechis australis*).

The snakes and lizards are well described in Glauert's *Handbook of the Snakes of Western Australia* and *Handbook of the Lizards of Western Australia* (see bibliography at the end of this Part).

Because of the great distance of the Kimberley Division from centres of scientific research, insufficient is known of its snakes and lizards. As in the case of some of the smaller mammals, some endemic species of lizards have been described, but until much more scientific collecting and research has been done it will not be possible to evaluate such apparently-unique species. Some Kimberley species of lizard, e.g. the Frilled Lizard (*Chlamydosaurus kingi*), through being commonly illustrated in journals because of their bizarre appearance, have become familiar to the public.

#### **Amphibia <sup>(4)</sup>**

Unlike the other continents Australia has no newts or salamanders (Urodela) or worm-like gymnophionans (Apoda). However, frogs (Anura) are abundant.

The frogs of Western Australia fall into the same grouping (Bassian, Eyrean and Torresian) which was mentioned in the section on mammals. However, they lack the diversity of genera and species shown by other groups and only ten genera with about thirty species are known from south of the Tropic of Capricorn. Of these, two genera, *Metacrinia* and *Myobatrachus*, each with one species, are restricted to the south-west. Most of the other kinds of frogs are distinct from, but related to species found elsewhere in Australia.

Since most of Western Australia is exceedingly dry it is of interest to note that frogs are common in these arid regions. Those species of *Heleioporus* which occupy marginal desert habitats overcome drought conditions by burrowing into the damp sub-soil. However, the arid-country species of *Neobatrachus* frequent clay soil where deep burrows are impossible and water can be lost. These species show no special capacity to endure greater water loss than *Heleioporus* species, but they do display an exceptional capacity for rapid replacement of water when water is present, as for example after thunderstorms. The water-holding frog, *Cyclorana platycephalus*, is found in inland and northern parts of the State. All 'desert' species retain an aquatic larval life, but this is much shorter than that of species in the well-watered parts of the State. The only species lacking aquatic larval development occur in the wetter south-west; these are *Myobatrachus gouldii*, *Metacrinia nicholli* and *Crinia rosea*. *Myobatrachus gouldii* is the only species which exhibits any strong dietary preference and eats only termites (Isoptera).

#### **Freshwater Fishes <sup>(5)</sup>**

The truly freshwater fish fauna of the southern part of the State is, by eastern Australian standards, an impoverished one and the species, with the exception of the freshwater catfish ('cobbler'), are diminutive in size. Most of the species are representatives of eastern Australian

(<sup>4</sup>) Written in collaboration with Prof. A. R. Main.

(<sup>5</sup>) Revised by J. B. Hutchins.

genera, such as the Pigmy Perch (*Edelia vittata*), Mountain Trout (*Galaxias truttaceus*), the Native Minnow (*G. occidentalis*) and Black-striped Minnow (*Galaxiella nigrostriata*). Others are more distinctive, with no near relative in eastern Australia, such as the Nightfish (*Bostockia porosa*), the King River Perchlet (*Nannatherina talstoni*) and the Salamander Fish (*Lepidogalaxias salamandroides*). There are several gobies (*Favonigobius suppositus* and *Pseudogobius olorum*) and hardyheads (including *Atherinosoma presbyteroides*, *A. elongata* and *Craterocephalus cuneiceps*). A lamprey (*Geotria australis*) ascends the rivers to breed and has been recorded north to the Moore River, but is more abundant in the streams emptying on the south coast. An eel (*Anguilla australis*) has been recorded from the south-west but it is not known whether it is native to the area or has been introduced.

The north-western rivers have a richer fish fauna. The most widespread species is the Spangled Perch (*Leiopotherapon unicolor*), a useful food fish which occurs in all rivers south to the Murchison. A large catfish (*Arius australis*) reaching 2.3 kg in weight, occurs in the systems south to the Fortescue. The Rainbow Fish (*Melanotaenia australis*), popular with aquarists occurs in the river systems of the Pilbara and the Kimberley. The remarkable Blind Gudgeon (*Milyeringa veritas*) and blind eel (*Anommatophasma candidum*) occur in wells and subterranean channels in the North West Cape area. The Kimberley Division has an even larger series of freshwater fishes. These include a catfish (*Tandanus unicolor*), various Bony Bream (*Nematolosa erebi*), various perch-like fishes (family Teraponidae), Gudgeons (*Hypseleotris*) and two freshwater saw-fishes (*Pristis clavata* and *Pristiopsis leichhardtii*). There is also a freshwater eel (*Anguilla bicolor*) in these far northern waters.

### Marine Fishes <sup>(6)</sup>

The marine fish fauna of Western Australia is probably richer in species than that of any other Australian State. This is because the fishes of the northern part of the State's very long coastline belong to the rich tropical Indo-Pacific fauna, while its southern fauna is a temperate one which includes many elements peculiar to Australian waters. The most up-to-date list of the species of Western Australian fishes, published in 1948, enumerates 740 species, but since that time collecting has revealed about 700 more. Even so, this figure is still far short of the total number which, it is suspected, will eventually be found to be in the neighbourhood of 2,000.

From this it can be seen that there is much to be learnt about fishes of Western Australia but it is probable that only a few of these species are confined to Western Australian waters. At present it seems that most of the fish occurring in the tropical part of the State are widely distributed, and species often range throughout the whole of the tropical Indian and Pacific Oceans, while the species which are found along the south coast usually occur also in the waters of South Australia, Victoria, Tasmania and southern New South Wales.

Between Cape Leeuwin and Shark Bay both northern and southern elements are found, the tropical element dominating as far south as the Houtman Abrolhos.

In addition to the widely-distributed tropical and southern elements, there are a number of species, between thirty and forty, which seem to be peculiar to Western Australia. It is necessary to be cautious here for two reasons. Firstly, because the Indo-Pacific fish fauna is, as a whole, poorly known and some fishes, at present only recorded from Western Australia, may actually have wider ranges. Secondly, our classification of fishes is still imperfect so that fishes which we regard as endemic to Western Australia may be known from some other region, but under different names. On the other hand there can be no doubt that at least a proportion of these species which we now believe to be endemic will prove to be confined to Western Australian waters.

In the following very incomplete review, a number of the more important and interesting families and species are listed.

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<sup>(6)</sup> Contributed by Dr G. F. Mees.

Of the major groups, the Elasmobranchii (sharks and rays) are richly represented, with nearly eighty species, of which the most familiar are the Port Jackson Shark (*Heterodontus portusjacksoni*), the Carpet Shark or Wobbegong (*Orectolobus maculatus*) and the shark known locally as the Swan River Whaler (*Carcharhinus leucas*), which can be caught in the Swan River as far upstream as the Garratt Road Bridge. It occurs during the summer months and one non-fatal attack in the Swan River has been attributed to this species. The Port Jackson Shark and the Carpet Shark are regarded as harmless to man; of the dangerous species, the Tiger, the Whaler and the White Pointer are perhaps the best known. Four fatalities from shark attack have been recorded for Western Australia (in 1803, 1923, 1925 and 1967) and a few people are known to have been maimed. It may be said, however, that in Western Australia the danger of shark attack is low.

Most major families of bony fishes are represented, but only a number of the more interesting of familiar species can be mentioned here.

There are about ten species of true herring (Clupeidae), one of which, the Pilchard (*Sardinops neopilchardus*) will in future probably become of economic importance. The rather similar-looking *Amblygaster postera* seems to be confined to Western Australia. The State is particularly rich in sea-horses and pipe fishes, there being some thirty-eight species. The most familiar of these is perhaps the leafy sea-horse (*Phyllopteryx foliatus*) which is often found on the beaches after storms. The so-called Sand Shark or Rat Fish (*Gonorhynchus greyi*), a peculiar fish and the sole representative of its family, deserves mention; it is fairly common off sandy coasts of the south-west. Though eels are represented by several families and over twenty species, only three are common in the south-west; the Snake Eel (*Ophisurus serpens*), a slender golden brown eel inhabiting sandy estuaries, which is often taken for a snake and referred to as the water snake; Woodward's Eel (*Gymnothorax woodwardi*), found on rocky shores, yellowish green with a network of grey lines; and the Conger Eel (*Conger wilsoni*), which normally is grey in colour.

Garfishes (Hemiramphidae) are common. Of their relatives the Long Toms (Belonidae), only *Belone ciconia* is common in the south-west, the others being more tropical in distribution, though one of the northern species, *Belone hians*, has been found as far south as Rottnest Island.

Silversides and hardyheads (Atherinidae) are well represented and so are mullets (Mugilidae). Some representatives of these groups have been mentioned in the preceding section, which deals with freshwater fishes.

The family Serranidae, known as groper, rock cod, etc. are represented by nearly thirty species. The best known is the North-west Groper (*Epinephelus tauvina*) which attains a length of more than two metres. Most species have a very wide, mainly tropical distribution, but *Epinephelus rankini* is only known from a restricted area round Onslow and must be looked upon as endemic to Western Australia. In temperate waters the preceding family is more or less replaced by the related Hypoplectridae.

Some small families, like the Australian Salmon (Arripidae), Whiting (Sillaginidae) and Snappers (Sparidae) are of great economic importance, though there are only a few species. On the other hand the Skipjacks (Carangidae) are one of the largest families of the State and comprise some thirty species. Another group which are also called Snappers (Lutjanidae) is prominent in the tropical part of the State. These are often referred to as North-west Snappers and should not be confused with the southern Snapper (*Chrysophrys unicolor*) which belongs to the Sparidae.

Coral fishes (Chaetodontidae) are richly represented, mainly along reefs in the tropics, but a number of species come down to the Houtman Abrolhos, and some even near to Perth. Most species have a very wide distribution in the Indo-Pacific, but one, *Chaetodon assarius*, has not been found outside Western Australia.

The Mackerel family (Scombridae), which includes mackerel, Spanish mackerel, tuna, bonito and albacore, is important both in tropical and temperate waters. The related marlins and swordfishes, well known to sporting fishermen, also occur in these waters.

Flatfishes (Heterosomata) occur in a great variety of species, and the same can be said of Parrotfishes and Wrasses (Scaridae and Labridae). All these groups are as yet very insufficiently known.

The stargazers and stonelifers are sluggish bottom fishes that deserve mention because of their unusual shape. One, *Ichthyoscopus barbatus*, occurs off the south-west coast and also in South Australia, and is regularly caught by anglers. Another species, *Ichthyoscopus insperatus*, a common fish of the north-west coast from Broome to Shark Bay, seems to be confined to Western Australia. The dragonets (Callionymidae), of which nine species have been recorded, are smaller, but their pretty appearance attracts attention, and one species, *Dactylopus dactylopus*, widely distributed in the Indo-Pacific, is regularly found off sandy beaches as far south as Rockingham.

Blennies (Blenniidae), weedfish (Clinidae), and gobies (Gobiidae) are small fishes of which there are many species; blennies are most plentiful in rockpools and on reefs in the tropics, while gobies are also found on sandy bottoms.

There are some forty species of scorpion fishes known from the State, the most familiar of which are *Scorpaena sumptuosa* in the south, and the small *Scorpaena bynoensis* in the north; the first-mentioned species is also interesting in that, though it has been known for almost a century, it has never been recorded from outside Western Australia. Of the closely-related Synancejidae, the feared stone fish, three species are known from the State, one of which, *Erosa daruma*, is apparently restricted to the north-west and is known from but two specimens. A related species occurs in Queensland and Japan.

Flatheads (Platycephalidae) are common in the temperate part of the State.

An interesting family is that of the angler fishes or toad fishes (Antennariidae). Their curious shape with the leg-like pectoral fins always excites attention. There are about a dozen species, two of which are endemic to the State. One of these is *Echinophryne glauerti* which is occasionally found washed up on City Beach.

Leatherjackets (Monacanthidae) are a large group distinguished by the rough leathery skin and a single large erectile spine on the nape. Some species, like *Chaetoderma penicilligera*, are common and of attractive appearance.

Of the blowfish family, the common Blowie (*Tetraodon [Spheroides] pleurogramma*) needs special mention; it is extremely plentiful off the coast at Fremantle and in the Swan River estuary. It is poisonous to eat and is greatly disliked by anglers who find that it greedily takes their bait. Fishes of this family contain a poisonous substance called tetraodontoxin and the celebrated navigator Captain James Cook was very ill after eating a blowfish in the course of a voyage in the Pacific in 1774. Boxfishes (Ostracientidae) and porcupine fishes (Diodontidae) are related groups, each represented by a number of species.

Further information about the commercial fishes in Western Australian waters is given in the Fisheries section of Chapter VIII, Part I — *Primary Production* where the principal species of edible fish are listed together with the quantities of each species caught. The section also contains additional information relating to whaling (see *Mammals* earlier in this Part).

#### THE INVERTEBRATE FAUNA (?)

The invertebrate fauna of Western Australia is large and varied, as one would expect in a third of a continent which extends from temperate to tropical zones and includes both coastal and desert areas. Rather than spread our descriptions too thinly over this enormous field we have restricted ourselves to a brief summary of the position in relation to a few selected groups in which work is being actively carried out.

(?) Written with assistance from Drs R. W. George, E. P. Hodgkin, L. E. Koch, Barbara Y. Main and B. R. Wilson, Mr G. W. Kendrick and Mrs L. M. Marsh.

Several invertebrate species are commercially exploited here, the most important being the Western Rock Lobster (*Panulirus cygnus*) which supports an extensive export fishery. Others commercially important include several species of octopus, cuttlefish and squid, the Blue Swimming Crab ('Blue Manna', *Portunus pelagicus*), several species of prawns, two species of scallops (*Amusium balloti* and *Pecten modestus*), and three species of abalone. Pearl-shell was fairly extensively fished along the north-west coast but this fishery has now declined, the smaller quantity of pearl-shell now taken being used in the developing pearl-culture industry.

A summary of the terrestrial and freshwater invertebrate fauna and their ecology is given in Main's *Guide for Naturalists* (1968).

### Echinodermata

All five groups of echinoderms, feather stars (Crinoidea), star fish (Asteroidea), brittle stars (Ophiuroidea), sea urchins (Echinoidea) and sea cucumbers (Holothurioidea) are well represented in the rich echinoderm fauna of the continental shelf and shore waters of Western Australia.

The majority are either tropical species or endemic species with tropical affinities.

A recent assessment of the starfish has shown that of the 114 described species nearly half are either widely distributed Indo-Pacific species or are found in the East Indian region while less than 20 per cent are southern Australian species and nearly 40 per cent are found only in Western Australia.

The only starfish likely to be of economic importance in Western Australia is *Acanthaster planci*, the crown-of-thorns, which feeds on living corals and has caused extensive damage to coral reefs in the Indo-Pacific region when in plague numbers. This species is found in Western Australia from the Kimberley coast to the North West Cape area. A fairly large population in the Dampier Archipelago, monitored by the Western Australian Museum between 1972 and 1974, was found to aggregate seasonally in shallow water but did not cause significant damage to the coral reefs.

Certain edible species of holothurians known as *beche-de-mer* or *trepang* occur on the shores and reefs of north-western Australia. Little is known of the fishing potential for trepang on the offshore reefs but the resource has been traditionally fished by boats from Indonesia.

### Mollusca

The molluscan fauna of the Western Australian coastline has not been recently catalogued, but from the area within fifty-six kilometres of Fremantle 270 species of bivalves (Pelecypoda), and univalves (Gastropoda) are recorded. The smaller groups, chitons (Amphineura), octopus and cuttlefish (Cephalopoda) and tusk shells (Scaphopoda) are also represented.

Molluscs dominate the intertidal rocks of the west coast, especially chitons, periwinkles, and limpets; the limpets range from the very large *Patellanax laticostata* to the small *Notoacmea onychitis*. On the north-western coast, rock oysters (*Saccostrea* spp.) and barnacles are dominant intertidally. The oysters are fished for food on a small scale in places where extensive beds are uncovered at low tide.

Bivalves occur mainly on sandy and muddy bottoms such as those of Cockburn Sound and King George Sound, and along the north-western coast. They are less plentiful on the unstable sandy shores of the open western coast. The Golden-lipped Pearl-shell (*Pinctada maxima*) is the basis of the flourishing pearl-culture industry in the north of the State. This species is favoured because of the quality of the pearls produced and because of the speed with which the nacre or mother-of-pearl is laid down on the 'seeds'. Using techniques developed by the Japanese these seeds are inserted into the pearl-shell's flesh to produce spherical pearls, or between the flesh and the shell to produce half-pearls. The small pearl-shell which is so abundant in Shark Bay belongs to the species *Pinctada albina* which is widely distributed in the Indian and Pacific Oceans. It was formerly gathered for the natural pearls which, though small, are of a fine colour and texture.



An abalone fishery has been established in temperate waters. On the lower west coast the small Roe's or Western Black-lip abalone (*Haliotis roei*) is gathered. Along the southern coast east of Cape Leeuwin the larger Green-lip (*Haliotis laevis*) and the Brown-lip abalone (*Haliotis conicopora*) are taken.

Many species of cowrie shells occur on the rocky shores of the north-west coast while a few species such as *Cypraea* (*Zoila*) *friendii* and *Cypraea* (*Austrocypraea*) *reevei* are confined to the south-western corner of the State. The north-west coast also has many endemic species of volute shells such as *Volutoconus hargreavesi*, *Amoria macandrewi* and *Amoria praetexta*.

Of the gastropods without visible shells two species are conspicuous in the fauna of the Fremantle area. One is the large sea-hare (*Aplysia gigantea*) with a small internal shell; it may be cast up on the beaches in large numbers after winter storms. The other is a nudibranch, with no shell at all, the colourful *Glossodoris westraliensis*, well known to visitors to Rottnest Island.

The non-marine molluscan fauna (terrestrial and aquatic) is not diverse. Conspicuous in the south-west are species of the pulmonate genus *Bothriembryon*, which are adapted to a wide variety of habitats from cool temperate rain forest to arid steppe. In the Kimberley, north-west, and arid regions generally the snail family Camaenidae predominates. Throughout the State there are also many other smaller and inconspicuous terrestrial snails and a small number of aquatic snails and bivalves.

### Corals

Coral reefs are well developed in a number of places on the shores and continental shelf of Western Australia (Fairbridge, 1950). Patch and platform reefs are numerous on the inner part of the Sahul and North West Shelves while on the outer parts of these shelves is a series of great atolls, Scott and Seringapatam Reefs and the Rowley Shoals, the fauna of which is poorly known. There are fringing reefs along the shores of the mainland and near-shore islands of the Kimberley and Pilbara coasts but coral growth is restricted due to turbidity caused by the outflow of rivers, muddy shoreline (in parts) and the large tidal range. However, some coral genera such as *Trachyphyllia*, *Caulastrea* and *Moseleya* appear to favour the turbid inshore waters while many others tolerate these conditions. In the Dampier Archipelago there is a rich coral fauna of more than forty-eight genera (Wilson and Marsh) found from the most turbid inshore waters to the relatively clear waters of the outer islands.

A part barrier, part fringing reef, the Ningaloo Reef Tract, extends for 145 kilometres southwards from North West Cape. It lies up to five kilometres off the coast with deep water off its outer edge and a shallow lagoon inshore. The barrier reef is broken by a number of passages along the sides of which the most diverse and luxuriant coral growth is found while in places there are dense thickets of staghorn corals (*Acropora* spp.) in the lagoon. Thirty-eight genera and over eighty species of reef-building corals, including the non-scleractinian blue coral *Heliopora* and the fire coral *Millepora* occur on these reefs.

The most southerly true coral reefs in the Indian Ocean are found at the Houtman Abrolhos which lie near the edge of the continental shelf off Geraldton in latitude 28-29°S. *Acropora*, one of the most important reef builders, flourishes at the Abrolhos, where the minimum sea temperature seldom falls below 19°C, but does not occur further south except in Pleistocene fossil beds at Rottnest Island.

The great diversity of habitat in the Abrolhos reefs, from extreme shelter of the 'blue holes' in the inner reefs to extreme exposure on the seaward reefs, provides conditions for several genera not found on more northerly reefs making the Abrolhos an exceptionally rich coral area for its latitude. The generic diversity at the Abrolhos is as high as in the North West Cape area although there is a general reduction in the number of species recorded.

The coral fauna diminishes sharply south of the Abrolhos but a number of species extend their range into the south-west of the State, sometimes forming extensive colonies but never true reefs. At Rottnest Island *Pocillopora damicornis* and *Montipora* make striking pink and violet

patches in shallow water while *Pocillopora* covers a shallow reef at Parker Point. Twelve genera of reef corals are found in the Fremantle area including Rottnest Island and Cockburn Sound where corals are well developed despite minimum water temperatures sometimes falling below 14°C.

Further south seven genera reach Geographe Bay where *Turbinaria* forms large colonies, and three genera extend along the south coast to the Recherche Archipelago.

### Crustacea

The most important commercial species of crustacean in Western Australian marine waters is the Western Rock Lobster, *Panulirus cygnus*. It occurs from North West Cape in the north to Hamelin Bay in the south. In the tropics five additional species of *Panulirus* occur; these are collectively referred to as 'Tropical Rock Lobsters' (*Panulirus versicolor*, *P. ornatus*, *P. homarus*, *P. penicillatus* and *P. polyphagus*). On the southern coast occurs *Jasus novaehollandiae*, (Southern Rock Lobster) which is the commercial species of rock lobster in south-eastern Australia, but it is not of economic importance in this State.

Two species of Shovel-nosed Lobsters are sometimes taken in prawn trawls. *Thenus orientalis*, the Moreton Bay Bug, occurs in Exmouth Gulf and further north. *Ibacus peronii*, the Balmain Bug, lives in sandy silt along our south coast. Both species are good eating. Offshore beyond the 180-metre depth limit of the Western Rock Lobster, lives a large spiny crab *Hypothalassia armata* which may develop into a commercial proposition.

The Swan River Prawn or School Prawn (*Metapenaeus dalli*) is taken by amateur and professional fishermen in the west coast estuaries by small hand-hauled nets. In the northern gulfs and bays larger prawns of the genus *Penaeus* and *Metapenaeus* are sought by large commercial prawn trawls for export. The present main centres are at Shark Bay, Exmouth Gulf and Nickol Bay and exploration of waters around the Kimberley Region is continuing. The main species are the Western King Prawn (*P. latisulcatus*), the Brown Tiger Prawn (*P. esculentus*) and the Banana Prawn (*P. merguensis*).

The Blue Swimming Crab (*Portunus pelagicus*), plentiful in the summer in the estuaries of the Swan River and at Mandurah, is one of the common commercial crabs of Australia.

Two common species of crab are the Rock Crab (*Leptograpsus variegatus*) and the Ghost Crab (*Ocypode convexa*). The Rock Crab scrambles among rocks and jetty piles of the west and south coasts, whereas the Ghost Crab digs spiral burrows at the edge of the beach and is endemic to the west coast.

Of the many other species of non-commercial crustaceans some groups have been recently monographed by scientific workers. These are the swimming crabs, mantis shrimps, pebble crabs and ghost crabs.

Crustacea are also common in inland waters (see *Fauna of Inland Waters* at the beginning of this Part).

### Spiders

Like most other invertebrate groups, the spiders are represented by a large number of genera and species and it is not possible at this stage to give an accurate picture of the relationships of the Western Australian fauna to the rest of Australia. Early work on the Western Australian spiders was restricted to the description and naming of species. Research now is centred on investigations of the biology of various species and the special adaptations of endemic forms to the particular conditions of the Western Australian environment. The most interesting of the spiders, when viewed from this aspect, are the burrowing groups, including primarily the Mygalomorphae ('trapdoor' spiders) and the Lycosidae (Wolf spiders). Some of these forms show special adaptations to semi-arid environments, to reduced food supply, and to flash-flooding, such adaptations being paralleled in many taxonomically unrelated genera. It is also of interest that some families, which in other parts of the world and in the wet forests of Australia are primarily web weavers and litter dwellers, are burrowers in the arid parts of

Western Australia (and also in other dry parts of Australia). Such forms are essentially nocturnal and escape the unfavourable conditions of the day by remaining in their burrows and some species seal their burrows during the summer period.

### Scorpions

The large brown scorpions, belonging to the genus *Urodacus*, are common in Western Australia where they live under small rocks and in deep spiral burrows in more arid places. Other scorpion genera (e.g. *Lychas*, *Cercophonius*) are small and variegated and live under the bark of trees and logs and amongst stones and litter. All these scorpions are nocturnal and sometimes sting humans.

### Insects

The more important insect species occurring in Western Australia (particularly those of economic significance) are dealt with in Part 5 of this Chapter.

## EXTINCT FAUNA AND FLORA <sup>(8)</sup>

Current work by the University of Western Australia on barytes deposits from North Pole Mine, sixty kilometres north-west of Marble Bar, has demonstrated the existence of stromatolites, algal accumulations, in rocks believed to be almost 3,500 million years old. Their existence has caused extreme interest among geologists throughout the world as they provide a direct link from the present to the earliest signs of life on earth. Throughout the rest of the Precambrian, up to 550 million years ago, stromatolites occur sporadically through the sequence. At Hamelin Pool, Shark Bay, stromatolites are still in existence.

The explosion in development of marine life forms at the beginning of the Cambrian Period is demonstrated in the far north-eastern part of the State, trilobites and brachiopods occurring in rocks of that age in the Ord River region. The following Ordovician Period was dominated by deposition of shallow water sediments in the Canning Basin — 2,250 metres of rocks containing abundant early Ordovician nautiloids, trilobites and graptolites.

In the Silurian Period, which commenced nearly 450 million years ago, sedimentation was very restricted in Western Australia, affording little evidence of marine life. However, in the Murchison River district vast deltaic deposits, formed by what must have been a very large river system draining inland mountains now represented by their worn down roots, have preserved tracks of numerous animals. Most significant are the tracks of one metre long eurypterids, giant scorpion-like creatures. These tracks appear to be the most extensive found anywhere in the world.

The warm Devonian seas, in which grew magnificent reef complexes of the Canning Basin, in particular those exposed in Windjana Gorge, abounded in early fish. These primitive, armoured animals have been found silicified in nodules, from which, by immersion in acetic acid, the animals have been reconstructed to their original form. These fish are recognised as being among the best preserved of their kind in the world and have been the basis for important research into the early evolution of fish.

The 250-350 million year old Permo-Carboniferous rocks in the Canning and Carnarvon Basins form some of the most highly fossiliferous rocks of the State: brachiopods, crinoids, bivalves and ammonoids crowd the rocks at many horizons. The Triassic rocks of Western Australia, although occupying a small area contain, locally, abundant remains of large fossil amphibians, up to one metre in length. Few fossiliferous sedimentary rocks were deposited during the Jurassic Period anywhere in Australia, but near Geraldton limestones contain bivalves, gastropods, ammonites and rare echinoids.

During the early Cretaceous, terrestrial sandstones were deposited near Broome and afford the only evidence of the existence of dinosaurs in Western Australia — footprints of a large theropod. The Cretaceous rocks of the State are more notable for the occurrence of a prolific

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<sup>(8)</sup> Contributed by Dr K. J. McNamara, Curator of Palaeontology, Western Australian Museum.

ammonite fauna in marls in the Carnarvon Basin. These ammonites lived near the close of the Cretaceous Period at about 65 million years ago, and close to the period of extinction of this group of animals.

With the onset of the Palaeocene Period there was a drastic change in the nature of the marine fauna, the dominant fossils in the rocks in the Carnarvon Basin being echinoids and brachiopods. The Palaeocene to Eocene sediments contain fossils very similar to those of a similar age found in Madagascar and south-eastern Africa, whereas the Miocene and younger rocks contain a fauna which bears many similarities to the modern Western Australian fauna.

Little is known about animal life on the land during the Tertiary. However, during the Pleistocene Period, from about two million years to 10,000 years ago, there is fossil evidence of the existence of giant marsupials, including the rhinoceros-like *Diprotodon*, the buffalo-like *Zygomaturus*, a marsupial lion, *Thylacoleo*, more and larger kangaroos, and the giant wombat *Phascalomys*.

## FURTHER SOURCES OF INFORMATION ON THE WESTERN AUSTRALIAN FAUNA

### Distribution

- BODENHEIMER, F. S. and WEISBACH, W. W. (ed.). *Monographiae Biologicae*, vol. 8, The Hague, 1959.
- C.S.I.R.O. *The Australian Environment*. 2nd ed. Melbourne, 1950.
- DAKIN, W. J. *Australian Seashores*. Sydney, 1952.
- KEAST, A., CROCKER, R. L. and CHRISTIAN, C. S. (ed.). 'Biogeography and Ecology in Australia'.
- MICHAELSEN, W. and HARTMEYER, R. *Die Fauna Sudwest-Australiens*. Jena, 1910-1911.
- RIDE, W. D. L. 'On the past, present, and future of Australian Mammals'. *Aust. J. Sci.*, vol. 31, 1968, pp. 1-11.
- SERVENTY, D. L. and WHITTELL, H. M. *Birds of Western Australia*. 4th ed. Perth, 1967.
- SPENCER, BALDWIN (ed.). *Report on the Work of the Horn Expedition to Central Australia*. Part I, Summary. Melbourne, 1896.

### Mammals

- CHITTLEBOROUGH, R. G. 'Dynamics of two populations of the Humpback Whale (*Megaptera novaeangliae*)' (Borowski). *Aust. J. Mar. Freshw. Res.*, vol. 16, 1965, pp. 33-128.
- GLAUERT, L. 'The Development of our Knowledge of the Marsupials of Western Australia'. *J. Roy. Soc. W. Aust.*, vol. 34, 1950, pp. 115-34.
- RIDE, W. D. L. *A Guide to the Native Mammals of Australia*. Oxford University Press, Melbourne, 1969.
- RIDE, W. D. L. 'On the past, present, and future of Australian Mammals'. *Aust. J. Sci.*, vol. 31, 1968, pp. 1-11.
- TROUGHTON, E. *Furred Animals of Australia*. 5th ed. Sydney, 1954.
- WOOD JONES, F. *The Mammals of South Australia*. (Handbook of Flora and Fauna of South Australia), 1923.

### Birds

- MAYR, E. and SERVENTY, D. L. 'The Number of Australian Birds Species'. *Emu*, vol. 44, 1944, pp. 33-40.
- SERVENTY, D. L. and WHITTELL, H. M. *Birds of Western Australia*. 4th ed. Perth, 1967.
- SERVENTY, D. L. and WHITTELL, H. M. 'A Systematic List of the Birds of Western Australia'. *Special Publ. W. Aust. Mus.*, No. 1. Perth, 1948.

### Reptiles

- GLAUERT, L. *A Handbook of the Lizards of Western Australia*. (Published by the Western Australian Naturalists' Club). Perth, 1961.

GLAUERT, L. *A Handbook of the Snakes of Western Australia*. (Published by the Western Australian Naturalists' Club). 3rd ed. Perth, 1967.

### Amphibians

MAIN, A. R. *Frogs of Southern Western Australia*. Handbook No. 8 of the Western Australian Naturalists' Club. Perth, 1965.

MAIN, A. R. *Key to the Frogs of South-Western Australia*. Handbook No. 3 of the Western Australian Naturalists' Club. Perth, 1954.

MAIN, A. R., LEE, A. K. and LITTLEJOHN, M. J. 'Evolution in Three Genera of Australian Frogs'. *Evolution*, vol. 12, 1958, pp. 224-33.

### Fishes

HUTCHINS, B. *The Fishes of Rottnest Island*. Creative Research, Perth, 1979.

MEES, G. F. 'Additions to the Fish Fauna of Western Australia'. Fisheries Department, Western Australia. *Fisheries Bull. W. Aust.*, No. 9, pt 1 (1959), pt 2 (1960), pt 3 (1962).

SCOTT, T. D. *The Marine and Freshwater Fishes of South Australia*. Adelaide, 1962.

WHITLEY, G. P. 'A List of the Fishes of Western Australia'. Fisheries Department, Western Australia. *Fisheries Bull. W. Aust.*, No. 2, 1948.

### Echinoderms

CLARK, H. L. 'Echinoderms from Australia'. *Mem. Mus Comp. Zool. Harvard*, vol. 55, 1938.

CLARK, H. L. *The Echinoderms of Australia*. Carnegie Institution of Washington, publication 556. Washington D.C., 1946.

MARSH, L. M. 'Western Australian Asteroidea since H. L. Clark'. *Thalassia Jugoslavica* vol. 12, pt 1, 1976, pp. 213-25.

### Molluscs

HODGKIN, E. P. and others. *The Shelled Gastropoda of South-Western Australia*. Handbook No. 9 of the Western Australian Naturalists' Club. Perth, 1966.

WILSON, B. R. and GILLETT, K. *A Field Guide to Australian Shells*. A. H. and A. W. REED, Sydney, 1979.

WILSON, B. R. and GILLETT, K. *Australian Shells*. A. H. and A. W. REED, Sydney, rev. ed. 1974.

### Coelenterates

CARLGREN, O. 'Actiniaria and Zoantharia from South and West Australia'. *Arkiv for Zoologi*, vol. 6, pt 34, 1954, pp. 571-95.

FAIRBRIDGE, R. W. 'Recent and Pleistocene Coral Reefs of Australia'. *J. Geol.*, vol. 58, pt 4, 1950, pp. 330-701.

WELLS, J. W. 'Two new scleractinian corals from Australia'. *Rec. Aust. Mus.*, vol. XXV, No. 2, 1962, pp. 239-42.

WILSON, B. R. and MARSH, L. M. 'Coral reef communities at the Houtman Abrolhos Western Australia, in a zone of biogeographic overlap'. *Proc. Int. Symp. Mar. Biogeog. and Evolution in the Southern Hemisphere*. Auckland, 1978.

### Crustaceans

GEORGE, R. W. 'Description of *Panulirus cygnus* sp. nov., the Commercial Crayfish (or Spiny Lobster) of Western Australia'. *J. Roy. Soc. W. Aust.*, vol. 45, pt 4, 1962, pp. 100-10.

GEORGE, R. W. 'Tropical spiny lobsters, *Panulirus* spp., of Western Australia (and the Indo-West Pacific)'. *J. Roy. Soc. W. Aust.*, vol. 51, pt 2, 1968, pp. 33-8.

GEORGE, R. W. and MARY E. KNOTT. 'The Ocypode Ghost Crabs of Western Australia (Crustacea, Brachyura)'. *J. Roy. Soc. W. Aust.*, vol. 48, pt 1, 1965, pp. 15-21.

GEORGE, R. W. and GRIFFIN, D. J. G. 'The Shovel-nosed Lobsters of Australia'. *Australian Natural History*, vol. 17, 1972, pp. 227-31.

- STEPHENSON, W. 'Some Interesting Stomatopoda — Mostly from Western Australia'. *J. Roy. Soc. W. Aust.*, vol. 45, pt 2, 1962, pp. 33-43.
- STEPHENSON, W. and McNEILL, F. 'The Australian Stomatopoda (Crustacea) in the Collections of the Australian Museum, with a Check List and Key to the known Australian Species'. *Rec. Aust. Mus.*, vol. XXIII, No. 5, 1955, pp. 239-65.
- STEPHENSON, W. and others. 'The Australian Portunids (Crustacea; Portunidae)'. *Aust. J. Mar. Freshw. Res.*, vol. 8, pp. 312-68, 491-507, vol. 10, pp. 84-124, vol. 11, pp. 73-122, vol. 12, pp. 92-128.
- TYNDALE-BISCOE, MARINA and GEORGE, R. W. 'The Oxystomata and Gymnopleura (Crustacea Brachyura) of Western Australia with descriptions of two new species from Western Australia and one from India'. *J. Roy. Soc. W. Aust.*, vol. 45, pt 3, 1962, pp. 65-96.

### Spiders

- MAIN, B. Y. 'The Biology of Aganippine Trapdoor Spiders (Mygalomorphae Cterizidae)'. *Australian Journal of Zoology*, vol. V, 1957, pp. 402-73.
- MAIN, B. Y. *Spiders of Australia*. Jacaranda Press, Brisbane, 1964.

### Scorpions

- KOCH, L. E. 'The Taxonomy, Geographic Distribution and Evolutionary Radiation of Australo-Papuan Scorpions'. *Rec. W. Aust. Mus.*, vol. 5, pt 2, 1977, pp. 83-367.
- KOCH, L. E. 'A Comparative Study of the Structure, Function and Adaptation to Different Habitats of Burrows in the Scorpion Genus *Urodacus* (Scorpionida, Scorpionidae)'. *Rec. W. Aust. Mus.*, vol. 6, pt 2, 1978, pp. 119-46.

### Insects

- WATSON, J. A. L. *The Dragonflies (Odonata) of South-Western Australia*. Handbook No. 7 of the Western Australian Naturalists' Club. Perth, 1962.

### General

- The Journal of the Royal Society of Western Australia*, vol. 1 (1915)-vol. 56 (1973).
- MAIN, A. R. *A Guide for Naturalists*. Handbook No. 4 of the Western Australian Naturalists' Club. 2nd ed. Perth, 1968.
- Records of the Western Australian Museum and Art Gallery*, vol. 1, pts 1 (1910), 2 (1912), 3 (1914), and vol. 2, pt 1 (1939).
- The Western Australian Naturalist*, vol. 1 (1947)-vol. 12 (1973).

### Marine Ecology

- HODGKIN, E. P., MARSH, L. and SMITH, G. G. 'The Littoral Environment of Rottnest Island'. *J. Roy. Soc. W. Aust.*, vol. 42, pt 3, 1959, pp. 85-8.
- HODGKIN, E. P. and PHILLIPS, B. F. 'Sea temperatures on the coast of South-Western Australia'. *J. Roy. Soc. W. Aust.*, vol. 52, pt 2, 1969, pp. 59-62.
- MARSH, L. M. and HODGKIN, E. P. 'A Survey of the Fauna and Flora of Rocky Shores of Carnac Island, Western Australia'. *The Western Australian Naturalist*, vol. 8, pt 3, 1962, pp. 62-72.

## Chapter II—continued

### Part 5 — Entomology in Western Australia

#### With Particular Reference to Agriculture

(Contributed by the Entomology Branch, Department of Agriculture)

The entomological field in Western Australia is so vast and the number of active workers on the subject so few that much still remains to be learned about the insects found in this State. A wide range of environmental conditions exists, from the tropical north to the temperate south, and the geographical isolation of the State has allowed the development of numerous endemic forms. As may be expected, the insect fauna of the Kimberley Division shows closer affinities with that of North Queensland than with the lower half of the State. The central desert, which reaches the coast to the south along the Great Australian Bight and to the north along the Eighty Mile Beach, forms an effective barrier discernible in the distribution of flora, mammals, insects and birds.

Owing to the limitations of space no attempt has been made to cover all the various insect orders which occur in the State, but the economic importance of various groups and their influence on major agricultural industries have been outlined, and some of the more outstanding forms of general interest have been mentioned. There are several references to beneficial insects which have been introduced to the State for the control of agricultural pests. This reflects a worldwide trend towards the use of biological control measures which can operate in conjunction with, and sometimes replace, chemical pesticides. In Western Australia, the use of natural agents in pest control is an increasingly important facet of agricultural research.

#### Order Collembola (Springtails)

The springtails include the lucerne flea, *Sminthurus viridis* (Linnaeus) which was introduced into this State from eastern Australia in about 1910. It has spread to almost all the clover-growing areas in the south-west and is a very serious pasture pest. Partial control is exercised by the predatory pasture snout mite, *Bdellodes lapidaria* (Kramer).

#### Order Odonata (Dragonflies and Damselflies)

These insects are predatory in both the immature and adult stages and are usually regarded as beneficial creatures. However, they sometimes injure vegetable seedlings by ovipositing into furrow-irrigated crops. This has occurred mainly at Carnarvon where surface water is scarce and where irrigated plants are presumably mistaken for aquatic vegetation.

In order to survive in the diverse climatic conditions which exist in Western Australia, some members of the dragonfly group have developed the ability to breed in highly saline waters and to take advantage of ephemeral inland pools.

#### Orders Orthoptera, Mantodea, Blattodea, Phasmatodea (Grasshoppers, Locusts, Mantids, Cockroaches, etc.)

The grasshoppers and locusts are represented by a large number of different species. The most important pest form is the small plague grasshopper, *Austroicetes cruciata* (Saussure). The normal habitat of this species lies roughly between the 200 millimetre and the 400 millimetre isohyets. For breeding it favours hard, bare soil and as extensive areas once utilised for wheat growing have now reverted to grazing, these uncultivated tracts periodically give rise to serious grasshopper swarms, which menace the adjacent wheat lands. The Australian plague locust,

*Chortoicetes terminifera* (Walker), so troublesome in other States, occurs in Western Australia but rarely as a plague species. In the Kimberley the yellow-winged locust, *Gastrimargus musicus* (Fabricius), the migratory locust, *Locusta migratoria* (Linnaeus) and the spur-throated locust, *Austracris guttulosa* (Walker) assume plague proportions, but in the southern agricultural districts they occur in the solitary phase only. The mantids (Mantidae) are represented by many different species. Their well-developed fore-limbs are admirably adapted for catching prey and, like their foliage-feeding relatives the phasmatids or leaf insects (Phasmatidae), their colouring harmonises remarkably with the sticks and leaves on which they rest. The cockroach fauna includes a large number of native species as well as several introduced forms. The commonest pest species is the cosmopolitan American cockroach, *Periplaneta americana* (Linnaeus). Some large and quite colourful forms occur in the inland regions with the genus *Polyzosteria* well represented.

#### **Order Isoptera (Termites)**

The so-called white ant is a serious pest in all parts of the State. Earth-dwelling types occur mainly, and among the most important species may be cited the giant termite, *Mastotermes darwiniensis* Froggatt of the north and the widely distributed subterranean termite, *Coptotermes acinaciformis* (Froggatt). The large mounds of the spinifex termite, *Nasutitermes triodiae* (Froggatt) are characteristic of certain landscapes in the pastoral areas. Heavy annual losses are caused by termite damage.

#### **Order Phthiraptera (Lice)**

Indigenous species occur on birds and native mammals, and various introduced forms infest domestic poultry, horses, cattle and sheep.

#### **Order Thysanoptera (Thrips)**

This order is represented locally by a large number of native species as well as several introduced forms. The most serious native species is the plague thrips, *Thrips imaginis* Bagnall which may swarm in apple blossoms and seriously affect the crop setting.

*Thrips tabaci* Lindeman, often called the onion thrips, is a carrier for the plant disease spotted wilt. Severe damage to tomato plants may result from this virus.

#### **Order Hemiptera (Bugs, Aphids, Scale Insects)**

This group contains a large number of pest species, many of them introduced. The green vegetable bug, *Nezara viridula* (Linnaeus) is now present throughout the State but is well controlled by the introduced parasitic wasp, *Trissolcus basalis* (Wollaston). The native Rutherglen bug, *Nysius vinitor* Bergroth may at times swarm on vegetables and fruit trees, but seems less serious in this State than on the other side of the continent. The crusader bug, *Mictis profana* (Fabricius), so named because of the light-coloured St Andrew's cross on the back of the adult, feeds normally on acacias and other native plants, but it frequently invades cultivated areas and it may be troublesome to young citrus. The apple dimpling bug, *Campylomma livida* Reuter is a native species which sometimes causes severe malformation of apples by feeding upon the very small developing fruit.

One native aphid, *Anomalaphis comperei* Pergande has been recorded. The only two districts from which it has so far been collected are Albany and Karridale where it has been found infesting native peppermint, *Agonis flexuosa*. A point of interest about these occurrences is that the aphids were associated with a heavy Argentine ant infestation in the area. Since the removal of the ants no further aphids have been discovered.

Numerous introduced species occur as pests on vegetables, garden plants and fruit trees. The green peach aphid, *Myzus persicae* (Sulzer) occurs on peaches, potatoes, rape, etc.; citrus and apple trees are attacked by the black citrus aphid, *Toxoptera citricidus* (Kirkaldy) and the woolly aphid, *Eriosoma lanigerum* (Hausmann) respectively, and the cabbage aphid, *Brevicoryne brassicae* (Linnaeus) is found on cabbages, cauliflowers, rape, etc. The cowpea



aphid, *Aphis craccivora* Koch which carries a virus disease of subterranean clover known as 'stunt' has also been found attacking lupins. The spotted alfalfa aphid, *Therioaphis trifolii* (Monell) f. *maculata* was found in eastern Australia in 1977 and was first detected in Western Australia in 1978. It is a serious pest of lucerne and has since spread to all lucerne growing areas of the State. Three species of parasitic wasp have been introduced to help in its control. One of these wasps, *Trioxys complanatus* Quilus has become established in south-west lucerne areas. The blue-green aphid, *Acyrtosiphon kondoi* Shinji, another exotic pest species which attacks lucerne, medics and clovers, was recorded for the first time in Western Australia in June 1979. The parasitic wasp *Aphidius ervi* Haliday has been introduced to combat this pest.

Of the native coccids the gall-forming members of the genus *Apiomorpha* are among the most remarkable. The woody galls in which the female insects pass their days vary from minute structures to woody knobs the size of an apple. From an economic point of view, however, the various introduced scale insects demand most attention. Included in the list of pest species are the following:

San José scale, *Comstockaspis perniciosus* (Comstock), which is a serious pest of apples,

California red scale, *Aonidiella aurantii* (Maskell), which is found mainly on citrus but with a wide host range,

black scale, *Saissetia oleae* (Olivier), which is found attacking citrus, stone fruits and garden shrubs,

white wax scale, *Gascardia destructor* (Newstead), which is mainly a pest of citrus but also attacks many cultivated shrubs,

soft brown scale, *Coccus hesperidum* Linnaeus, which has a wide host range but is of greatest importance on citrus, and

grass-crown mealybug, *Antonina graminis* (Maskell), which is a widespread and troublesome pest causing damage to lawns particularly in warm parts of the State.

### Order Coleoptera (Beetles)

This order is the dominant one among existing insects and is represented in Western Australia by many and varied forms. The carnivorous ground beetles (Carabidae) are widely distributed, one of the best-known species being the green carab beetle, *Calosoma schayeri* Erichson. The tiger beetles, of the sub-family Cicindelinae, are of interest not only because of the metallic colouration seen in many forms but because of their association with the inland salt-lakes. The larvae are subterranean and may be collected by digging on the lake margins.

The ladybirds (Coccinellidae) comprise a group of considerable economic importance and in addition to native species the State contains a number specially introduced to combat various scale insects and aphids. Among the best known of the introduced species are the mealybug ladybird, *Cryptolaemus montrouzieri* Mulsant and the common spotted ladybird, *Harmonia conformis* (Boisduval). The larvae of *Cryptolaemus* are covered with a whitish material which makes the insect superficially resemble the mealybugs upon which it feeds. *H. conformis*, in conjunction with the parasitic wasp, *Aphelinus mali* (Haldeman), plays an important role in combating the woolly aphid of apple trees. Destructive leaf-eating ladybirds belonging to the genus *Henosepilachna* were once found only in the northern parts of the State where they attack vegetables, especially pumpkins and melons. In 1956, specimens of *Henosepilachna* were collected in Perth and since then they have become established in several suburban areas.

The jewel beetles (Buprestidae) contain some of the most colourful beetles to be found anywhere in the world. Western Australia is particularly rich in species and at times the beetles may be found in large numbers on flowering mallee and sandplain flora. One of the most attractive is the metallic green *Stigmodera gratiosa* Chevrolat, and one of the largest is *Julodimorpha bakewelli* White, measuring approximately seventy millimetres in length.

The cockchafers or scarabs (Scarabaeidae) are represented by a great diversity of forms. Several species may swarm on to flowering fruit trees and roses in the early summer and are popularly known as spring beetles. The bronze-coloured *Colymbomorpha vittata* Britton is a common pest of apple trees during the blooming period and the saddle-backed beetle, *Phyllotocus ustulatus* Blanchard sometimes visits citrus blossoms in large numbers. An introduced species commonly known as the African black beetle, *Heteronychus arator* (Fabricius) has gained a firm footing in the State and is a troublesome pest of lawns and turf. It is also growing in importance as a pasture and vegetable pest. A native species of *Colpochilodes* has caused spasmodic damage to cereal crops and clover pastures in the southern portions of the State.

The longicorn beetles (Cerambycidae) are a group of wood-boring insects represented by a number of different species. They are often blamed for the death of forest eucalypts, although investigations have shown that heavy beetle infestations are usually secondary and that healthy trees are seldom seriously affected by the beetles. The larval stage of this group is the so-called 'bardee', at one time prized by the Aborigines as food. They are not a pest of structural timber as they do not attack seasoned material.

The leaf beetles (Chrysomelidae) may superficially resemble ladybirds in general appearance as some of them are rounded and quite brightly coloured. Two species have been introduced into the State for the purpose of combating St John's wort, a troublesome weed in some districts. *Chrysolina quadrigemina* (Suffrian) and *C. hyperici* (Forster) were originally introduced into Australia from the South of France and liberated in Victoria with very satisfactory results. The local colonies were obtained from the latter source and have become established in several districts. In some situations a reduction in St John's wort can be attributed definitely to beetle activity, but in many areas the picture is obscure because of the extensive use of chemical sprays.

Common pest species in eastern Australia are the pumpkin beetles, *Aulacophora hilaris* (Boisduval) and *A. palmerstoni* Blackburn. These beetles are found in the north of the State but do not extend into the cooler latitudes.

The weevils (Curculionidae) are a very specialised group characterised by the presence of a rostrum or 'snout' which bears the mouth and antennae. The genus *Leptopius* contains a number of large greyish weevils, many of which breed in association with acacias. One of the best-known members of the family is the redlegged weevil, *Catasarcus impressipennis* (Boisduval) which feeds on eucalypt foliage and may disfigure young street trees. The almost world-wide rice weevil, *Sitophilus oryzae* (Linnaeus) is our principal weevil pest of stored grain, but the granary weevil, *S. granarius* (Linnaeus) also occurs. Two common orchard pests are the introduced apple weevil, *Otiorynchus cribricollis* Gyllenhal and Fuller's rose weevil, *Asynonychus cervinus* (Boheman). The small lucerne weevil, *Atrichonotus taeniatulus* (Berg) and the whitefringed weevil, *Graphognathus leucoloma* (Boheman) have recently increased their attack on the roots of lucerne and potato tubers in the lower south-west and coastal areas. Two other pest species of weevil which appear to have been introduced recently into this State are the sitona weevil, *Sitona discoideus* Gyllenhal, a pest of legumes, and the garden weevil, *Phlyctinus callosus* Boheman.

### Order Neuroptera (Lacewings)

This order contains a number of useful insects, for many of the neuropterous larvae feed upon scale insects and other pests. The family Myrmeleontidae has a number of large, rather dragonfly-like species, the larval stages of which build conical sand pits and are commonly known as ant lions. Amongst the most remarkable of the local lacewings are two members of the family Nemopteridae in which the hind wings are greatly modified. In the genus *Croce* they are long and thread-like and in the spoonwinged lacewing, *Chasmoptera hutti* Westwood they are spoon-shaped or paddle-shaped.

### Order Diptera (Flies, Mosquitoes, etc.)

This group contains a vast number of species, many of which are of major economic importance.

The mosquitoes are well represented, the commonest species being the brown house mosquito, *Culex fatigans* Wiedemann and the dengue mosquito, *Aedes aegypti* (Linnaeus). The latter species is the carrier for dengue fever in the northern portion of the State. The anophelines are represented by the widely distributed *Anopheles annulipes* Walker and several much rarer forms. *A. annulipes*, together with *Aedes alboannulatus* Macquarie, have played an important part in the spread of the rabbit virus *Myxomatosis*.

Of the introduced flies, those causing most trouble are the Australian sheep blowfly, *Lucilia cuprina* (Wiedemann) and the Mediterranean fruit fly, *Ceratitis capitata* (Wiedemann). Recent research has revealed that the Western goldenhaired blowfly, *Calliphora albifrontalis* Malloch and the lesser brown blowfly, *Calliphora vicina* Hardy are also important in sheep strike. The buffalo fly, *Haematobia irritans exigua* De Meijere is a serious stock pest in the Kimberley Division of the State, but so far has not become established in the cattle areas of the south. It is believed to have originally reached Australia on buffaloes introduced from Asia.

The common house fly, *Musca domestica* Linnaeus is widespread as is also the native bush fly, *Musca vetustissima* Walker.

Insecticides such as DDT, dieldrin and the various organic phosphates gave outstanding control of various fly pests for several years. The widespread development of resistance in both house fly and blowfly populations has greatly complicated the matter, however, and drawn attention to the importance of preventive measures, such as sanitation in the case of house flies, and the Mules operation and crutching in the case of sheep blowfly.

The March flies (Tabanidae) are well represented but, although their blood-sucking habits render them annoying both to livestock and humans they are not a serious pest.

Of the many useful flies may be mentioned the blowfly-like tachinids which parasitise caterpillars, grasshoppers and other pests and the bee flies (Bombyliidae) which parasitise the eggs of other insects. The maggots of the bombyliid fly, *Cyrtomorpha flaviscutellaris* Roberts are commonly found in the egg pods of the small plague grasshopper, *Austroicetes cruciata* (Saussure).

### Order Siphonaptera (Fleas)

A number of introduced as well as native fleas occur in this State. The rabbit stickfast flea, *Echidnophaga myrmecobii* Rothschild, found originally on native mammals, is a very common parasite of rabbits in the drier parts of the State. The poultry stickfast flea, *E. gallinacea* (Westwood) closely resembles the former species but is mainly a pest of poultry and domestic animals. The oriental rat flea, *Xenopsylla cheopis* (Rothschild), the human flea, *Pulex irritans* Linnaeus and the cat and dog fleas, *Ctenocephalides felis* (Bouché) and *C. canis* (Curtis) are among the most important introduced species.

### Order Lepidoptera (Moths, Butterflies, etc.)

The primitive swift moths (Hepialidae) are represented locally by a number of very beautiful forms. The larvae are wood borers but do not occur in sufficient numbers to constitute a serious forestry pest. Several large and striking members of the genus *Aenetus* occur in the lower south-west.

A group of small native moths of the family Pyralidae, sub-family Crambinae and commonly known as pasture webworm moths, *Hednota pedionoma* (Meyrick), *H. crypsichroa* Lower, etc. are serious pests of cereal crops (excepting oats) and grass pastures. Depredations are controlled by planting on clean fallow, but the recent trend towards ley farming has greatly favoured these pests.

A family of considerable interest to the orchardist is the Tortricidae, in which group are included the codling moth, *Cydia pomonella* (Linnaeus) and the oriental fruit moth, *C. molesta*

(Busck). Outbreaks of codling moth have occurred on a number of occasions but drastic eradication measures have so far prevented this major apple pest from becoming permanently established and have given Western Australia the distinction of being the only large apple-producing country where the moth is not a major problem. The oriental fruit moth has not recurred since eradication measures were taken against an outbreak in the Bickley Valley in 1952.

One of the best-represented families is the Noctuidae which contains several important pests. Included under this heading are the native budworm and the cotton bollworm, *Heliothis punctiger* Wallengren and *H. armiger* (Hubner), the cluster caterpillar, *Spodoptera litura* (Fabricius), the rough bollworm, *Earias huegeli* Rogenhofer, the brown cutworm, *Agrotis munda* Walker, the southern armyworm, *Persectania ewingii* (Westwood), the common armyworm, *Mythimna convecta* (Walker) and the northern armyworm, *Mythimna separata* (Walker). A parasitic wasp, *Apanteles ruficrus* Haliday has been introduced to help in the control of armyworms and cutworms. The fruitsucking moth, *Othreis materna* (Linnaeus) also belongs to this group and causes heavy losses in citrus fruit grown around pastoral homesteads in the Kimberley and the north-west. In almost all cases where moths and butterflies are regarded as pests it is only the caterpillar stage which is destructive. The fruit-sucking moth, however, has a rasp-like proboscis capable of piercing orange and citrus skins and then sucking up the juice. Fortunately the creatures do not normally range to the citrus areas of the south-west.

One of the most remarkable members of the family Agaristidae is the whistling moth, *Hecatesia thyridion* Feisth. The male of this species is active just at sunset and makes a loud clicking noise during its fast circling flight.

Other common moth pests are the cabbage moth, *Plutella xylostella* (Linnaeus), the potato moth, *Phthorimaea operculella* (Zeller) and the apple looper moth, *Chloroclystis laticostata* (Walker).

The beautiful dryandra moth, *Carthaea saturnioides* Walker with its large eye spots on the wings superficially resembles the emperor moths. Its range is restricted to south-west Australia.

The butterfly fauna of the State lacks many large and showy forms. Some of the northern species such as *Hypolimnas bolina nerina* Fabricius are quite colourful but the State has nothing to compare with the conspicuous and beautiful species found in the tropics of eastern Australia.

The blues (Lycaenidae) are well represented and the association of many larvae with ant nests renders the group a particularly interesting one.

The skippers (Hesperiidae) are relatively drab-coloured butterflies with strong powers of flight. Over twenty species are recorded from the State and some forms are endemic to the south-west.

Only one butterfly is of economic importance and that is the introduced cabbage white butterfly, *Pieris rapae* (Linnaeus) which reached this State in 1943. It attacks cabbages, cauliflowers and related plants as well as one or two other strong-tasting herbs such as watercress. The butterfly belongs to the whites, or Pieridae, which group contains a number of native species. Several members of this family, including the cabbage white, display extraordinary powers of flight and the caper white, *Anaphaeis java teutonia* (Fabricius) has been observed to carry out mass migrations of remarkable proportions on the eastern side of the continent.

A rather showy butterfly which appears to have become established here recently, at least around the Perth area, is the wanderer or monarch, *Danaus plexippus plexippus* (Linnaeus). This large orange and black butterfly has apparently reached Western Australia from the other States. The colourful larvae feed on certain noxious weeds such as the introduced narrow-leaf cotton-bush, *Asclepias fruticosa*.

### Order Hymenoptera (Bees, Wasps, Ants)

The wood wasps and sirex wasps (Siricidae) include several pests which have been established in New Zealand and Tasmanian pine forests. Imported timber has been fumigated from time to time following the location of infested material.

The sawflies (Pergidae and Tenthredinidae) are represented locally by a number of native forms. The larvae of the genus *Perga* may often be seen in caterpillar-like clusters amongst the foliage of eucalypts. An introduced sawfly, the pear and cherry slug, *Caliroa cerasi* (Linnaeus), is a common pest on pear and plum trees. The smaller parasitic wasps (ichneumonids, chalcids and their allies) are well represented and play an important role in combating many insect pests. Some attack insect eggs while others parasitise caterpillars, aphids and scale insects, so that without their aid the problem of pest control would be even more difficult than at present.

The ant fauna (Formicidae) of the State is extremely varied. One of the best-known native species is the meat ant, *Iridomyrmex purpureus* (F. Smith) which often nests on gravel paths and roadsides. Among the most remarkable of the local ants may be listed *Camponotus inflatus* Lubbock, the honey-pot ant of the interior, and *Myrmecia regularis* Crawley of the karri forest area which has the frog *Metacrinia nichollsi* (Harrison) as a tolerated guest in its nest. The honey-pot ant derives its name from the fact that certain individuals in the nest store honey until their abdomens become inflated to the size of grapes. This honey is then regurgitated to other ants as required. These ants were once prized by Aborigines as a food delicacy.

Two important introduced ant pests are the Argentine ant, *Iridomyrmex humilis* (Mayr) and the Singapore ant, *Monomorium destructor* (Jerdon). The Argentine ant was once widespread in the metropolitan area, Albany and Bunbury, with several other country outbreaks. The insect has been reduced in recent years, however, as a result of a large-scale control campaign. The scheme involved the spraying of all infested areas, with government-controlled labour, and a restriction on the movement of goods likely to spread the pest. From the commencement of the campaign in 1954 to 30 June 1980 27,569 hectares have been treated at a cost of approximately \$3 million.

The social wasps (Vespidae) were once known only from the northern portion of the State. About 1949, however, colonies of *Polistes variabilis* Fabricius were located in various parts of the Perth suburban area and they have now extended their range into surrounding country areas.

The European wasp, *Vespula germanica* (Fabricius) was detected in Western Australia for the first time in January 1977, in the Mosman Park area. Subsequent surveys and follow-up of reports from the public resulted in a further five nests being located in the suburbs of Cottesloe, Peppermint Grove and Attadale. All nests of this troublesome exotic insect were destroyed and it is hoped that the wasp has now been eradicated. The European wasp is similar in appearance to a honey bee but has distinct bright yellow and black markings across the body.

During surveys for the above insect, several colonies of an exotic paper nest wasp species, *Polistes gallicus* (Linnaeus) were discovered, mainly in the suburbs of Bicton, Palmyra and Beaconsfield. Coincidentally, this insect is similar in appearance to the European wasp in that it is roughly the same size and it has yellow and black markings. It differs by having a more slender body and a more pronounced 'wasp waist'.

The burrowing wasps, including the sand wasps (Pompilidae), the flower wasps (Scoliidae) and velvet ants (Mutillidae) are well represented. The mutillids are, of course, not true ants but the wingless females bear a superficial resemblance to ants which is further accentuated by their ability to inflict a painful sting. The flower wasps are particularly numerous and winged males carrying wingless females are common around flowering plants in the early summer. Of the velvet ants the black and white *Ephutomorpha rugicollis* Westwood is the best known. Most of the wasps mentioned are beneficial, for they store caterpillars and other insects in mud nests and underground burrows to serve as food for the wasp grubs.

The majority of native bees are solitary forms although some, like the Colletidae, often choose a common site for nest burrowing and hundreds of tunnels may be located close to one another.

The leaf-cutting bees (Megachilidae) often attract notice from their habit of cutting circular pieces from rose leaves and other foliage for use in nest construction.

The only native social bees belong to the genus *Trigona* which does not occur in the southern portions of the State.

#### CLASS ARACHNIDA (Spider, Mites, Ticks, etc.)

Creatures grouped under the above heading are, of course, not true insects and will be dealt with only very briefly. Several forms are of considerable economic importance, as for example the cattle tick, *Boophilus microplus* (Canestrini) and the fowl tick, *Argas persicus* (Oken). The cattle tick is confined to the Kimberley Division and its range corresponds roughly with that of the buffalo fly. The ornate kangaroo tick, *Amblyomma triguttatum* C.L. Koch is a common species. It is occasionally collected as an accidental parasite on domestic animals and man.

The most serious mite pest is the red-legged earth mite, *Halotydeus destructor* (Tucker) which is very destructive to young legumes and other seedlings. It may be particularly troublesome on subterranean clover pastures. Other mites of importance to orchardists and market gardeners are the spider mites (Tetranychidae) which include such cosmopolitan species as the twospotted mite, *Tetranychus urticae* Koch and the bryobia mite, *Bryobia rubrioculus* (Scheuten). A predacious mite, *Typhlodromus occidentalis* Nesbitt has recently been introduced to Western Australia for the control of the two-spotted mite. The predator has become established in a Manjimup apple orchard where its progress is being monitored by research workers.

Spiders constitute a large group, most of which are useful on account of their insectivorous habits, although bites from some of the larger species may produce painful after-effects. The most dangerous local spider is the redback spider, *Latrodectus mactans hasselti* Thorell. This species, whose bite may even prove fatal, is easily recognised by the conspicuous red streak down the centre of the abdomen.

Scorpions of various kinds are widely distributed over the State and the larger ones may be able to inflict a painful sting. There is one record of a baby dying at Pemberton from the effects of scorpion venom but no other reports of serious after-effects are available and, generally speaking, the group is of little local importance.

#### FURTHER SOURCES OF INFORMATION

The difficulties confronting anyone trying to review in a few pages the entomological fauna of such a large State as Western Australia will be better appreciated if it is remembered that in the *Western Australian Year-Book* for 1898-99 the late A. M. Lea expressed the opinion that there were about 30,000 species of insects indigenous to this State. Many additions have been made in the last eighty years or so and one is faced with the problem of deciding which creatures warrant special mention and which must be excluded for lack of space. The general reader interested in consulting other short reviews of the local insect fauna is referred to A. M. Lea's article in the 1898-99 Year Book under the title of 'The Insects of Western Australia'; in the Year Book for 1900-01 the late H. M. Giles wrote 'A Glimpse of Western Australian Entomology'.

Two short summaries have also appeared in conjunction with science conferences in this State. The *Handbook and Review* published for the 1926 meeting of the Australasian Association for the Advancement of Science contained an article by L. J. Newman and the *Handbook* for the 1947 meeting of the Australian and New Zealand Association for the Advancement of Science printed a short summary of the local insects by L. Glauert.

Readers interested in more technical summaries are referred to Professor G. E. Nicholl's 'The Composition and Biographical Relation of the Fauna of Western Australia' (*A.N.Z.A.A.S.*,

Vol. XXI, 1933, p. 93), the relevant volumes of *Die Fauna Sudwest-Australiens* by Michaelsen and Hartmeyer, 1907-1930, and the report of the Swedish expedition under Dr E. Mjoberg.

More detailed information relating to the forms of economic importance will be found in the publications of the Western Australian Department of Agriculture.

Literature covering the general aspects of Australian entomology is given below. Some of these publications are now out of print and possibly only obtainable through libraries.

ANON. *The Insects of Australia*. Division of Entomology, C.S.I.R.O. University Press, Melbourne, 1970. 1,029 pp.

BARRETT, C. AND BURNS, A. N. *Butterflies of Australia and New Guinea*. N. H. Seward Pty. Ltd., Melbourne, 1951. 187 pp.

BURNS, ALEXANDER N. *Australian Butterflies In Colour*. Reed, Sydney, 1969. 112 pp.

COMMON, I. F. B. *Australian Moths*. Jacaranda Press, Brisbane, 1963. 128 pp.

COMMON, I. F. B. *Australian Butterflies*. Jacaranda Press, Brisbane, 1966. 131 pp.

COMMON, I. F. B. AND WATERHOUSE, D. F. *Butterflies of Australia*. Angus and Robertson Pty. Ltd., Sydney, 1972. 498 pp.

GOODE, JOHN. *Insects of Australia*. Angus and Robertson Pty. Ltd., Sydney, 1980. 260 pp.

HUGHES, R. D. *Living Insects*. The Australian Naturalist Library. Collins, Sydney, 1975. 304 pp.

MCKEOWN, K. C. *Australian Insects*. An Introductory Handbook. Published by R.Z.S. of N.S.W., Sydney, 1945. 303 pp.

MAIN, BARBARA YORK. *Spiders of Australia*. Jacaranda Press, Brisbane, 1964. 124 pp.

RIEK, EDGAR. *Insects of Australia*. Jacaranda Press, Brisbane, 1963. 128 pp.

TILLYARD, R. J. *The Insects of Australia and New Zealand*. Angus and Robertson Ltd., Sydney, 1926. 560 pp.

WATERHOUSE, G. A. *What Butterfly is That?* A Guide to the Butterflies of Australia. Angus and Robertson Ltd., Sydney, 1932. 291 pp.

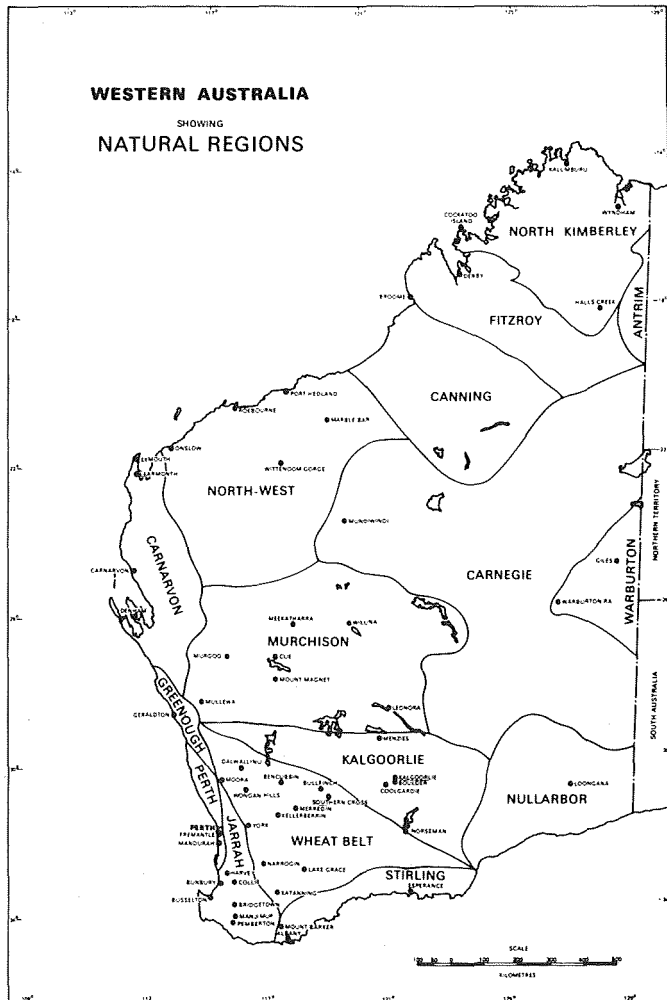
WATSON, J. A. L. *The Dragonflies (Odonata) of South-Western Australia*. Western Australian Naturalists' Club, Perth, 1962. 72 pp.

## Chapter II — continued

### Part 6 — Natural Regions

Contributed by Rex T. Prider, B.Sc., Ph.D., F.G.S., M. Aust.I.M.M.  
(Emeritus Professor of Geology, University of Western Australia)

The physical features, geology, climate, flora and fauna of Western Australia have been outlined earlier in this Chapter and the subdivision of the State into 'natural regions' may now be considered. A Natural Region is one clearly marked off from neighbouring regions by topographical, geological, climatic, or biological conditions, or by combinations of these, so that, as far as Man's activities are concerned, they have different economic possibilities.





# CHARACTERISTICS OF THE NATURAL REGIONS OF WESTERN AUSTRALIA

The subdivision of Western Australia into Natural Regions (see accompanying map) has been described by E. de C. Clarke in *J. Roy. Soc. W. Aust.*, vol. XII, 1927, pp. 117-32. A summary of the characteristics of these different Natural Regions (reprinted by courtesy of the University of Western Australia Press from Clarke, Prider and Teichert: *Elements of Geology for Western Australian Students*) is given below.

NATURAL REGION	TOPOGRAPHY	GEOLOGY	RAINFALL	WATER SUPPLY (a)	VEGETATION, ETC
ANTRIM ( <i>geographic</i> )	Tableland	Cambrian sediments and lavas	Summer, monsoonal, 500 to 1,000 millimetres	Catchments, wells and artesian	Grassland and savannah
NORTH KIMBERLEY ( <i>geographic</i> )	Dissected stony tableland	Younger Precambrian	Summer, monsoonal, 750 millimetres or more	Streams, springs, catchments	Luxuriant in valleys, sparse on tableland
FITZROY ( <i>chief river</i> )	Very wide valleys and low hills	Palaeozoic (largely Permian)	Summer, monsoonal, 500 to 750 millimetres	Catchments and artesian	Grassland and savannah
CANNING ( <i>A. W. Canning, surveyor and explorer</i> )	Sand ridges and tabletop hills	Palaeozoic and Mesozoic	Summer, 375 millimetres or less	Springs, pools, artesian water? (undeveloped)	'Spinifex' (species of <i>Triodia</i> ) and desert shrubs
CARNEGIE ( <i>David Carnegie, explorer</i> )	Sand ridges and tabletop hills	Mesozoic, Palaeozoic and Younger Precambrian	Variable and unreliable, probably about 125 millimetres	Catchments, wells	'Spinifex' and desert shrubs
WARBURTON ( <i>Warburton Range</i> )	Hills (some over 900 metres) separated by sandy country	Older Precambrian	Variable and unreliable, perhaps about 125 millimetres. Probably better than Carnegie Region owing to high hills	Catchments, wells, some springs	'Mulga' (species of <i>Acacia</i> ) and 'Spinifex'
NORTH-WEST ( <i>common usage</i> )	Rugged hills. Rivers in well-defined valleys	Younger and Older Precambrian. Many economic minerals	Variable, unreliable, 375 millimetres or less	Wells, catchments, pools	'Spinifex', few shrubs and trees
MURCHISON ( <i>common usage</i> )	Ridge hills and breakaways. Rivers in shallow beds. Salt 'lakes'	Older Precambrian. Economic minerals especially gold and nickel	Summer or winter, unreliable, 250 millimetres or less	Wells (potable groundwater)	'Mulga'. Eucalypts scarce except along rivers

KALGOORLIE (chief town)	Less hilly than Murchison. Salt 'lakes'. No defined watercourses except salt lake system	Older Precambrian. Economic minerals especially gold and nickel	Mainly winter, unreliable, 250 millimetres or less	Catchments. Ground water too salty for use	Eucalypt forest, especially Salmon Gum ( <i>E. salmonophloia</i> ), Gimlet ( <i>E. salubris</i> ) and Red Morrel ( <i>E. longicornis</i> )
WHEAT BELT (common usage)	Same as Kalgoorlie Region	Older Precambrian, but few 'green-stones'	Winter, reliable, 250 to 500 millimetres	Similar to Kalgoorlie Region, but ground water potable in many places; therefore wells frequent	Eucalypt forest — Salmon Gum, Gimlet, and Morrel
JARRAH (chief timber)	More dissected than Wheat Belt Region, especially near Darling Scarp	Like Wheat Belt Region but there is an extensive cuirass of laterite	Winter, reliable, 625 to 1,000 millimetres	Streams and springs	Forest of Jarrah ( <i>E. marginata</i> ), Wandoo ( <i>E. Wandoo</i> ), Karri ( <i>E. diversicolor</i> ) and Marri ( <i>E. calophylla</i> )
CARNARVON (chief town)	Elevated plain with table-top hills	Palaeozoic, Mesozoic, Tertiary and later	Summer or winter, very unreliable, about 250 millimetres	Artesian in many places. Catchments, pools	Sparse scrub in north, denser in south
GREENOUGH (river)	Sandstone tableland	Mesozoic and older	Winter, 375 to 500 millimetres	Springs, wells and catchments	Scrub
PERTH (chief town)	Coastal plain	Mesozoic and later	Winter, reliable, 500 to 875 millimetres	Springs, wells, artesian	Scrub, swamp and forest
STIRLING (prominent range)	Undulating tableland with abrupt ranges	Siliceous Tertiary sediments with inliers of Younger and Older Precambrian	Winter, 375 millimetres or less	Catchments. Stream water generally too salty for use	Heath and swamp
NULLARBOR (geographic)	Tableland, no hills	Calcareous Tertiary sediments	Winter, 250 millimetres or less	Catchments. Sub-artesian	Poor grassland

(a) 'Wells' refers to those that draw on ground water, but are not artesian. 'Catchments' refers to water collected on the surface — naturally in gnamma holes, artificially by conserving the run-off. 'Pools' refers to pools in watercourses and includes rock holes.

Many methods for the subdivision of the State have been suggested — based on climate, soil and ecology, physiography (geomorphology) and geology (including geological structure). These, together with Land and Statistical Divisions, have been dealt with in some detail by Gentilli in *Western Landscapes*, pp. 3-48. The scheme of 'natural regions' summarised above, which was first devised by E. de C. Clarke in 1926, taking note of all these variables, has stood the test of time well, although some of its details, in view of our increase in geological knowledge of the State and utilisation of light country by minor element studies, could be revised, and a finer division into subregions made.

FUTHER SOURCES OF INFORMATION ON THE  
NATURAL REGIONS OF WESTERN AUSTRALIA

CLARKE, E. de C. 'Natural Regions in Western Australia'. *J. Roy. Soc. W. Aust.*, vol. XII, 1927, pp. 117-32.

GENTILLI, J. (ed.). *Western Landscapes*. University of Western Australia Press (Sesquicentenary Series), Nedlands, 1979.

## CHAPTER III — CONSTITUTION AND GOVERNMENT

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## CHAPTER III — CONSTITUTION AND GOVERNMENT

Western Australia is one of the six federated sovereign States which, together with the Northern Territory and the Australian Capital Territory, constitute the Commonwealth of Australia. Thus, in addition to having its own Parliament and executive government, it is represented in the federal legislature. As well as government at the Federal and State levels, there is a third system, that of local government, which functions through City Councils, Town Councils and Shire Councils.

### OUTLINE OF CONSTITUTIONAL DEVELOPMENT

A Legislative Council was established in Western Australia shortly after its foundation as a Crown Colony and sat for the first time in February 1832. The Council was non-elective and consisted of the Governor and four senior officials. In 1839, membership was increased to nine when the Governor nominated four unofficial members. Additional appointments were made from time to time until the dissolution of the nominee Legislative Council in 1870 with the inauguration of representative government as provided for in the Australian Colonies Government Act of 1850. This Act, which enabled the establishment of representative governments in other Australian Colonies, withheld the privilege from Western Australia until such time as the Colony should be able to defray all costs of government from its own revenues, and it was not until 1870 that it was felt that Western Australia was able to satisfy this condition. The new Legislative Council, elections for which took place in October of that year, consisted of twelve elected members, three nominees and three officials. The number of members of the Council was increased in 1874 to 21, of whom 14 were elected, in 1882 to 24, of whom 16 were elected and in 1886 to 26, comprising 17 elected members, 5 nominees and 4 officials.

Following the passage by the Legislative Council of a Constitution Act in 1889 and subsequent representations made in London by delegates sent from the Colony, responsible government was granted to Western Australia by an Imperial Act assented to on 15 August 1890. Provision was made for the establishment of a Parliament of two Houses, to be known as the 'Legislative Council' and the 'Legislative Assembly', to replace the old Council. Proclamation of responsible government was made in Perth on 21 October 1890 and election of the thirty members of the Legislative Assembly took place in November and December. The fifteen members of the Legislative Council were nominated by the Governor, as provided in the Constitution Act, and the Parliament was officially opened on 30 December 1890. The Constitution Act of 1889, while prescribing a Council which was originally nominative, contained a provision that, after the expiration of six years or on the population of the Colony reaching 60,000, the Council should become fully elective. The required population was attained in 1893 and an amendment to the Act in that year enabled the election of twenty-one members to the Legislative Council, and at the same time increased the Legislative Assembly to thirty-three members. By an amendment of 1899, membership of the Legislative Council was raised to thirty and of the Legislative Assembly to fifty. Provision was made for the Legislative Assembly to be increased to fifty-one members by the *Constitution Acts Amendment Act (No. 2) 1965*. The increase in numbers, however, did not become effective until the State general election in 1968.

On 1 January 1901, Western Australia and the five other Australian Colonies were federated under the name of the 'Commonwealth of Australia', authority for the union having been given by the Commonwealth of Australia Constitution Act which was passed by the British Parliament in 1900. By a provision of the Constitution Act the constituent parts of the Commonwealth previously designated 'Colonies' became known as 'States'. Under the Constitution, powers are divided between the Parliaments of the Commonwealth and of the States by conferring power in respect of specific subjects on the Commonwealth either exclusively or jointly with the States, leaving the remaining powers to the States.

Procedure in both Federal and State Parliaments is based on British practice. The legislatures consist of the Sovereign, represented by the Governor-General of Australia or the Governor of the State, and the elected members. In the field of executive government the British 'Cabinet' system has also been adopted. The members of the Cabinets must hold seats in the legislature as elected members. The Cabinet is responsible to the Parliament and continues in office only while holding the confidence of the Parliament. All Cabinet Ministers are members of the Executive Council, the supreme group of advisers to the Crown, and the Cabinet thus provides the executive government of the Commonwealth or the State. The Executive Council is presided over by the Governor-General of Australia or the Governor of the State and at its meetings, which are formal and official in character, the decisions of the Cabinet are given legal form, appointments are made, resignations accepted, proclamations issued and regulations approved.

## VICE-REGAL REPRESENTATION

### **The Governor-General of Australia**

Under the Commonwealth Constitution, ultimate executive power is vested in the Crown and is exercised by the Governor-General as the direct representative of the Sovereign. Appointment to the office is made by the Crown after consultation with the Prime Minister of the Commonwealth. The present Governor-General is His Excellency Sir Zelman Cowen, A.K., G.C.M.G., G.C.V.O., K.St.J., who was sworn in on 8 December 1977. During the absence from Australia of the Governor-General it is usual for the senior among the State Governors to be appointed Administrator.

### **The Governor of Western Australia**

The Governor of Western Australia is the personal representative of the Sovereign in the State and exercises the powers of the Crown in State matters. He is the titular head of the Government and performs the official and ceremonial functions attaching to the Crown. The present Governor of Western Australia, His Excellency Rear-Admiral Sir Richard John Trowbridge, K.C.V.O., K.St.J., was sworn in on 25 November 1980. In the event of the Governor's absence from Western Australia the Lieutenant-Governor of the State is appointed Administrator. If there is no Lieutenant-Governor it is customary for the Chief Justice of Western Australia to be appointed Administrator. The present Lieutenant-Governor, the Chief Justice Sir Francis Burt, K.C.M.G., received his commission on 11 May 1977, replacing Commodore Sir James Maxwell Ramsay, C.B.E., D.S.C., who was appointed Governor of Queensland.

The last Governor of Western Australia as a Colony was Lieutenant-Colonel Sir Gerard Smith, K.C.M.G., whose term of office expired on 29 June 1900 and the first Governor of the State was Captain Sir Arthur Lawley, K.C.M.G., who was sworn in on 1 May 1901. The names and dates of assumption of office of Governors and acting Governors from the foundation of the Colony are shown in the list below.

## GOVERNORS AND ACTING GOVERNORS

Name and title	Date of assumption of office
Captain J. Stirling, R. N., Lieutenant-Governor	1828 — 30 December (a)
Captain F. C. Irwin, Lieutenant-Governor	1832 — 12 August
Captain R. Daniell, Lieutenant-Governor	1833 — 14 September
Captain P. Beete, Lieutenant-Governor	1834 — 11 May
Captain R. Daniell, Lieutenant-Governor	1834 — 24 May
Captain Sir James Stirling, Governor	1834 — 19 September
John Hutt, Esq., Governor	1839 — 3 January
Lieutenant-Colonel A. Clarke, K. H., Governor	1846 — 27 January
Lieutenant-Colonel F. C. Irwin, Governor	1847 — 12 February
Captain C. Fitzgerald, R.N., Governor	1848 — 12 August
A. E. Kennedy, Esq., Governor	1855 — 23 July
Lieutenant-Colonel John Bruce, Acting Governor	1862 — 20 February
J. S. Hampton, Esq., Governor	1862 — 28 February
Lieutenant-Colonel John Bruce, Acting Governor	1868 — 2 November
F. A. Weld, Esq., Governor	1869 — 30 September
W. C. F. Robinson, Esq., C.M.G., Governor	1875 — 11 January
Lieutenant-Colonel E. D. Harvest, Acting Governor	1877 — 7 September
Major-General Sir Harry St G. Ord, R.E., K.C.M.G., C.B., Lieutenant-Governor	1877 — 12 November
Major-General Sir Harry St G. Ord, R.E., K.C.M.G., C.B., Governor and Commander-in-Chief	1878 — 30 January
Sir W. C. F. Robinson, K.C.M.G., Governor	1880 — 10 April
H. T. Wrenfordsley, Esq., Administrator	1883 — 14 February
Sir F. N. Broome, K.C.M.G., Governor	1883 — 2 June
A. C. Onslow, Esq., Administrator	1884 — 13 November
Sir F. N. Broome, K.C.M.G., Governor	1885 — 18 June
Sir Malcolm Fraser, K.C.M.G., Administrator	1889 — 21 December
Sir W. C. F. Robinson, G.C.M.G., Governor	1890 — 20 October
A. C. Onslow, Esq., Administrator	1891 — 21 September
Sir W. C. F. Robinson, G.C.M.G., Governor	1892 — 9 July
Sir A. C. Onslow, Administrator	1895 — 18 March
Sir Gerard Smith, K.C.M.G., Governor	1895 — 23 December
Sir A. C. Onslow, Administrator	1900 — 23 March
E. A. Stone, Esq., Administrator	1901 — 4 March
Captain Sir Arthur Lawley, K.C.M.G., Governor	1901 — 1 May
Sir Edward Stone, Administrator	1902 — 14 August
Admiral Sir Frederick Bedford, G.C.B., Governor	1903 — 24 March
Sir Edward Stone, Administrator	1909 — 23 April
Sir Gerald Strickland, K.C.M.G., Governor	1909 — 31 May
Sir Edward Stone, Administrator	1913 — 4 March
Major-General Sir Harry Barron, K.C.M.G., C.V.O., Governor	1913 — 17 March
Sir Edward Stone, K.C.M.G., Administrator	1917 — 27 February
Rt Hon. Sir William Ellison-Macartney, P.C., K.C.M.G., Governor	1917 — 9 April
Sir Francis Newdigate-Newdegate, K.C.M.G., Governor	1920 — 9 April
Sir Robert McMillan, Administrator	1924 — 17 June
Colonel Sir William Campion, K.C.M.G., D.S.O., Governor	1924 — 28 October
Sir Robert McMillan, K.C.M.G., Lieutenant-Governor and Administrator	1929 — 7 January
Colonel Sir William Campion, K.C.M.G., D.S.O., Governor	1929 — 7 May
Sir John Northmore, K.C.M.G., Administrator	1931 — 9 June
Sir John Northmore, K.C.M.G., Lieutenant-Governor and Administrator	1932 — 30 June
Hon. Sir James Mitchell, K.C.M.G., Lieutenant-Governor	1933 — 11 July
Hon. Sir James Mitchell, G.C.M.G., Governor	1948 — 5 October
Hon. Sir John Dwyer, K.C.M.G., Administrator	1951 — 1 July
Hon. Albert Wolff, Administrator	1951 — 7 August
Hon. Sir John Dwyer, K.C.M.G., Administrator	1951 — 28 August
Lieutenant-General Sir Charles Gairdner, K.C.M.G., K.C.V.O., K.B.E., C.B., Governor	1951 — 6 November

GOVERNORS AND ACTING GOVERNORS — *continued*

Name and title	Date of assumption of office
Hon. Sir John Dwyer, K.C.M.G., Lieutenant-Governor and Administrator	1963 — 27 June
Major-General Sir Douglas Kendrew, K.C.M.G., C.B., C.B.E., D.S.O., Governor	1963 — 25 October
Air Commodore Hughie Edwards, V.C., C.B., D.S.O., O.B.E., D.F.C., Governor	1974 — 7 January
Air Commodore Sir Hughie Edwards, V.C., K.C.M.G., C.B., D.S.O., O.B.E., D.F.C., Governor	1974 — August
Commodore James Ramsay, C.B.E., D.S.C., Lieutenant-Governor and Administrator	1975 — 3 April
Air Chief Marshal Sir Wallace Kyle, G.C.B., K.C.V.O., C.B.E., D.S.O., D.F.C., K.St.J., Governor	1975 — 24 November
Rear-Admiral Sir Richard John Trowbridge, K.C.V.O., K.St.J., Governor	1980 — 25 November

(a) Letter of Appointment issued 30 December 1828; first Commission granted 4 March 1831, from which date he became Governor and Commander-in-Chief.

## THE FEDERAL PARLIAMENT

The legislative power of the Commonwealth is vested in a Federal Parliament which consists of Her Majesty the Queen (represented by the Governor-General), a Senate and a House of Representatives. Subject to the Constitution, the Federal Parliament is empowered to make laws concerning, among other things, defence, external affairs, customs and excise, trade and commerce with other countries and among the States, taxation, borrowing of money on public credit, currency and coinage, banking, insurance, navigation, fisheries, quarantine, posts and telegraphs, census and statistics, immigration, naturalisation and aliens, copyrights and trademarks, bankruptcy, marriage, divorce and matrimonial causes, social services, and conciliation and arbitration for the prevention and settlement of industrial disputes extending beyond the limits of any one State. The Constitution provides that, when a law of a State is inconsistent with a law of the Commonwealth, the Commonwealth law shall prevail and the State law shall, to the extent of the inconsistency, be invalid.

The qualifications necessary for membership of the Federal Parliament and for voting at federal elections are described in the *Official Year Book of Australia*. Under the provisions of the *Commonwealth Electoral Act* 1973, which was proclaimed operative from 21 March 1973, the age qualification for enrolment, voting and candidature for federal parliamentary elections was lowered from twenty-one years to eighteen years.

The payment of allowances to Senators and Members of the House of Representatives is provided for in the Constitution and a superannuation scheme is established under the provisions of the *Parliamentary Retiring Allowances Act* 1948.

**The Senate**

The Senate consisted originally of thirty-six members, six Senators being returned from each State. The Parliament is authorised by the Constitution to increase or decrease the number of members. The growth of the population since Federation having been such as to warrant a considerable enlargement of the Parliament, a Representation Act was passed in 1948 to provide for increased membership by raising from six to ten the number of Senators from each State. At the same time the alternative system of counting of votes in elections for the Senate was altered by the Commonwealth Electoral Act to one of proportional representation, a summarised description of which is given below.

The total number of first preference votes for all candidates is divided by one more than the number of candidates to be elected, and the resulting quotient, plus one, is taken as the quota necessary for each candidate to obtain in order to become elected. When the number of first preference votes received by an elected candidate is greater than the quota, and there are still vacancies to be filled, his votes in excess of the quota (surplus votes) are transferred in the following manner to the continuing candidates in proportion to the voters' preferences. The number of the elected candidate's surplus votes is divided by the number of his first preference



votes, the resulting fraction representing the transfer value of his surplus votes. The totals of the elected candidate's ballot papers, after the latter have been arranged in parcels according to the next available preference for continuing candidates, are multiplied by the transfer value. This determines the number of the elected candidate's votes to be transferred to each continuing candidate, the method being to transfer, after random selection, the appropriate number of ballot papers which bear the next available preference for that candidate.

After the surplus votes of all candidates elected on the count of first preferences have been so transferred, any continuing candidate who has received a number of votes equal to or greater than the quota is elected.

This procedure of the transfer of surplus votes of elected candidates is continued, while there are vacancies to be filled, until the stage is reached where no continuing candidate has received the quota of votes. Then the candidate with the lowest votes is excluded, and the whole of his ballot papers are transferred to the continuing candidates according to preferences. Any continuing candidate thereby obtaining the quota is elected, and if there are still vacancies his surplus votes are transferred.

The process of exclusion and transfer of ballot-papers is repeated until remaining vacancies are filled by candidates obtaining the quota, or, in respect of the last vacancy, by obtaining a majority of votes, even if this is less than the quota.

When transferring the surplus votes of elected candidates other than those elected on the count of first preference votes, only those ballot papers which have been transferred to the elected candidates at the last preceding count are considered. Similarly, in the transfer of surplus votes of a candidate elected during the exclusion procedure, only the ballot papers transferred from the candidate last excluded are taken into account.

The exclusion of the candidate with the lowest votes and the distribution of his ballot papers operate also immediately after the count of first preference votes, where no candidate has obtained the quota.

The Act also provides for the filling of a long casual vacancy by the continuing candidate who, next after the periodical vacancies have been filled as above, first receives a number of votes equal to or greater than the quota.

Members are elected on the basis of adult suffrage by the people of the State which they represent. As provided by the *Commonwealth Electoral Act* 1918, enrolment as an elector is compulsory for all qualified persons except those who are Aboriginal natives of Australia. Aborigines, although entitled to enrol, are not required to do so. Voting is compulsory for all enrolled persons in terms of an amendment of 1924 which operated for the first time at elections held on 14 November 1925. The term of office of a Senator is normally six years and commences on the first day of July following his election. One-half of the members retire at the end of every third year and are eligible for re-election.

#### WESTERN AUSTRALIAN MEMBERS OF THE SENATE

Due to retire on 30 June 1984		Due to retire on 30 June 1987	
Name	Political party	Name	Political party
Chaney, Hon. F. M.	Lib.	Crichton-Browne, N. A.	Lib.
Coleman, Ruth N.	A.L.P.	Durack, Hon. P. D., Q.C.	Lib.
Martyr, J. R.	Lib.	Giles, Patricia J.	A.L.P.
Thomas, A. M.	Lib.	McIntosh, G. D.	A.L.P.
Walsh, P. A.	A.L.P.	Withers, Rt Hon. R. G.	Lib.

A.L.P. = Australian Labor Party.

Lib. = Liberal Party of Australia.

Elections for the Senate were last held on 18 October 1980. The previous table shows the Western Australian membership of the Senate as from 1 July 1981.

### The House of Representatives

State membership of the House of Representatives is on a population basis with the proviso that each State shall have at least five members. The Constitution provides further that the number of members of the House of Representatives shall be, as nearly as practicable, double the number of Senators. With the enlargement of the Senate from thirty-six to sixty members, the membership of the House of Representatives was increased, from the date of the 1949 elections, from seventy-four to 121, not including a member for the Australian Capital Territory, which achieved representation for the first time at this election, and a member for the Northern Territory, which had been represented since 1922.

Western Australia's population growth had been such as to necessitate an increase in representation from five to eight, and this number was raised to nine in 1955 as a result of a redistribution following the Census of 30 June 1954. At the same time, the total number of members of the House of Representatives was increased to 122, excluding the two members for the internal Territories.

Consequent upon the population changes disclosed by the 1966 Census, a redistribution of the State electoral division boundaries was carried out in 1968 and the following representation in the House of Representatives became effective as from the general election held on 25 October 1969: New South Wales 45, Victoria 34, Queensland 18, South Australia 12, Western Australia 9, and Tasmania 5, the total number of members (excluding the members for the internal Territories) being increased from 122 to 123.

A redistribution of Western Australian electoral division boundaries was carried out in 1973, as a result of the population changes disclosed by the 1971 Census, and the State gained an additional seat in the House of Representatives. The tenth seat was named Tangney after Dame Dorothy Tangney, a former Labour senator for Western Australia. Representation of the Australian Capital Territory in the House was increased from one to two by the *Australian Capital Territory Representation (House of Representatives) Act 1973* and consequently the total number of members was raised to 127.

Members of the House of Representatives are elected for the duration of the Parliament, which is limited to three years, by the people of the electorate which they represent. As provided by the *Commonwealth Electoral Act 1918*, enrolment as an elector is compulsory for all qualified persons except those who are Aboriginal natives of Australia. Aborigines, although entitled to enrol, are not required to do so. Voting is on the preferential system and is compulsory for all enrolled persons in terms of an amendment of 1924 which operated for the first time at elections held on 14 November 1925.

Elections for the House of Representatives were last held on 18 October 1980. The next table shows the Western Australian membership of the House of Representatives at 30 June 1981.

#### WESTERN AUSTRALIAN MEMBERS OF THE HOUSE OF REPRESENTATIVES

Electoral division	Name	Political party	Electoral division	Name	Political party
Canning	Bungey, M. H.	Lib.	O'Connor	Tuckey, C. W.	Lib.
Curtin	Rocher, A. C.	Lib.	Perth	McLean, R. M.	Lib.
Forrest	Drummond, P. H.	Lib.	Stirling	Viner, Hon. R. I.	Lib.
Fremantle	Dawkins, J. S.	A.L.P.	Swan	Beazley, K. C.	A.L.P.
Kalgoorlie	Campbell, G.	A.L.P.	Tangney	Shack, P. D.	Lib.
Moore	Hyde, J. M.	Lib.			

A.L.P. = Australian Labor Party.

Lib. = Liberal Party of Australia.

## THE STATE PARLIAMENT

The Crown, represented by the Governor, and the Parliament, comprising a Legislative Council and a Legislative Assembly, constitute the legislature of Western Australia.

Executive government is based, as in the case of the Commonwealth and in other States, on the system which evolved in Great Britain in the eighteenth century and which is generally known as the 'Cabinet' system. The Cabinet consists of Ministers of the Crown chosen for the Ministry from members of Parliament belonging to the political party, or coalition of parties, which is in the majority in the Legislative Assembly. The Constitution requires that at least one of the Ministers be selected from members of the Legislative Council. In Western Australia, as in the other Australian States, the office of principal Minister is designated 'Premier'.

Since 1890, when responsible government was granted to Western Australia, there have been twenty-five separate Ministries as shown in the following table. No organised, political party existed in the Colony until the formation of a Labour party in the 1890s. A Labour Ministry assumed office in 1904.

## MINISTRIES FROM 1890

Name of Premier	Political party	Date of assumption of office	Duration		
			Years	Months	Days
Forrest	(a)	1890—29 December	10	1	17
Throssell		1901—15 February	—	3	12
Leake		27 May	—	5	25
Morgans		21 November	—	1	2
Leake		23 December	—	6	8
James	Labour	1902—1 July	2	1	9
Daglish		1904—10 August	1	—	15
Rason	Liberal	1905—25 August	—	8	12
Moore	Liberal	1906—7 May	4	4	9
Wilson	Liberal	1910—16 September	1	—	21
Scaddan	Labour	1911—7 October	4	9	20
Wilson	Liberal	1916—27 July	—	11	1
Lefroy	Liberal	1917—28 June	1	9	20
Colebatch	Liberal	1919—17 April	—	1	—
Mitchell	Nat. and C.P. (coalition)	17 May	4	10	30
Collier	Labour	1924—16 April	6	—	8
Mitchell	Nat. and C.P. (coalition)	1930—24 April	3	—	—
Collier	Labour	1933—24 April	3	3	27
Wilcock	Labour	1936—20 August	8	11	11
Wise	Labour	1945—31 July	1	8	1
McLarty	L.C.L. and C.P. (coalition)	1947—1 April	5	10	22
Hawke	Labour	1953—23 February	6	1	10
Brand	L.C.L. and C.P. (coalition)	1959—2 April	11	11	1
Tonkin	A.L.P.	1971—3 March	3	1	5
Court	Lib. and C.P. (coalition)	1974—8 April	Still in office (b)		

A.L.P. = Australian Labor Party. C.P. = Country Party (c).  
L.C.L. = Liberal and Country League (d). Nat. = Nationalist.

(a) No specific party designation. (b) At 30 June 1980. (c) The name of the Party was changed to the *National Country Party of Australia (W.A.) Inc.* on 5 May 1975. (d) The name of the Party was changed to *The Liberal Party of Australia (Western Australian Division) Incorporated* on 15 July 1968.

The Constitution Act of 1889 provided for a Ministry of five members. This number was increased to six by an amendment to the Act in 1896, to eight by another amendment in 1927, and to ten by the *Acts Amendment (Increase in Number of Ministers of the Crown) Act 1950*. The Ministry was increased to twelve members under the provisions of the *Constitution Acts Amendment Act 1965*. As authorised by the *Constitution Acts Amendment Act (No. 4) 1975* the

number of Ministers in the State Cabinet was increased from twelve to thirteen. The additional Minister, Mr I. G. Medcalf, M.L.C., was sworn in on 22 December 1975 as Attorney-General, and Minister for Federal Affairs. The names of the Ministers and the portfolios held by them at 30 June 1981 are shown in the next table.

The right to vote at parliamentary elections was extended to women by the *Constitution Acts Amendment Act 1899* and membership of either House was provided for by the *Parliament (Qualification of Women) Act 1920*. The first woman member of any Australian Parliament was Mrs Edith Dircksey Cowan, O.B.E., who was elected to the Legislative Assembly in March 1921 as member for West Perth. Mrs A. F. G. (later Dame Florence) Cardell-Oliver, M.L.A. for Subiaco, became the first woman Cabinet Minister in Australia when she joined the McLarty Ministry in 1947.

Payment of members was introduced in 1900 by a Payment of Members Act and a superannuation fund operates under the *Parliamentary Superannuation Act 1970-1980*.

#### THE MINISTRY FROM 12 FEBRUARY 1981

Name of Minister	Title of Office
Hon. Sir Charles Walter Michael Court, K.C.M.G., O.B.E., M.L.A.	Premier, Treasurer and Minister Co-ordinating Economic and Regional Development
Hon. Raymond James O'Connor, M.L.A.	Deputy Premier, Minister for Labour and Industry, Consumer Affairs, and Immigration
Hon. Richard Charles Old, M.L.A.	Minister for Agriculture
Hon. Ian George Medcalf, E.D., Q.C., M.L.C.	Attorney-General and Minister for Federal Affairs, and Leader of the Government in the Legislative Council
Hon. Andrew Mensaros, M.L.A.	Minister for Works, Water Resources, and Minister Assisting the Minister Co-ordinating Economic and Regional Development
Hon. Peter Vernon Jones, M.L.A.	Minister for Resources Development, Mines, Fuel and Energy, Housing, Regional Administration and the North West, Tourism, and Industrial Development and Commerce
Hon. Edgar Cyril Rushton, M.L.A.	Minister for Transport
Hon. Raymond Laurence Young, F.C.A., M.L.A.	Minister for Health
Hon. William Leonard Grayden, M.L.A.	Minister for Education, Cultural Affairs, and Recreation
Hon. David John Wordsworth, M.L.C.	Minister for Lands, and Forests
Hon. Margaret June Craig, M.L.A.	Minister for Local Government, and Urban Development and Town Planning
Hon. William Ralph Boucher Hassell, LL.B., M.A., M.L.A.	Chief Secretary, Minister for Police and Traffic, and Community Welfare
Hon. Gordon Edgar Masters, M.L.C.	Minister for Fisheries and Wildlife, and Conservation and the Environment
Hon. Ian James Laurance, B.A., M.L.A.	Honorary Minister Assisting the Minister in the portfolios of Housing, Regional Administration and the North West, and Tourism
Hon. Barry John MacKinnon, B.Ec., A.A.S.A., M.L.A.	Honorary Minister Assisting the Minister in the portfolio of Industrial Development and Commerce
Hon. Norman Frederick Moore, B.A., Dip. Ed., M.L.C.	Parliamentary Secretary of the Cabinet

#### The Legislative Council

At 30 June 1981 the Legislative Council consisted of thirty-two members, each of the sixteen electoral provinces into which the State was divided being represented by two members. Election is for a term of six years and one-half of the members retire every three years.

The qualifications of a candidate for election to the Legislative Council are that he or she shall be at least eighteen years of age, shall have resided in Western Australia for a minimum of one year, be a natural-born or naturalised British subject, and be enrolled or qualified for enrolment, as an elector. No person may hold office as a Member of the Legislative Council and a Member of the Legislative Assembly at the same time. A Judge of the Supreme Court, the Sheriff of Western Australia, an undischarged bankrupt, a debtor against whose estate there is a subsisting order in bankruptcy, or a person who has been attainted or convicted of treason or felony may not be elected to the Legislative Council. The qualifications for election as a member of the Legislative Council are identical with those necessary for election as a member of the Legislative Assembly. The qualifying age for a candidate for election to either House was reduced from twenty-one years of age to eighteen years of age under the provisions of the *Constitution Acts Amendment Act 1973* which was proclaimed operative from 1 January 1974.

The *Electoral Act 1907-1980* requires that to qualify for enrolment as an elector a person shall be at least eighteen years of age, be a natural-born or naturalised British subject, shall have lived in the Commonwealth of Australia for six months continuously, and shall have lived in Western Australia for three months continuously and in the district for which he claims enrolment for a continuous period of one month immediately preceding the date of his claim. The qualifying age for enrolment as an elector for both the Legislative Council and the Legislative Assembly was reduced from twenty-one years of age to eighteen years of age under the provisions of the *Electoral Act Amendment Act (No. 2) 1970*. The Act operated for the first time at the conjoint election for the Legislative Council and the Legislative Assembly held on 20 February 1971. A person is disqualified from enrolment if he is of unsound mind, has been attainted of treason, has been convicted and is serving sentence for any offence punishable by imprisonment for one year or longer, is the holder of a temporary entry permit for the purposes of the *Migration Act 1958* (Commonwealth) or is a prohibited immigrant under that Act. Enrolment is compulsory under the *Electoral Act Amendment Act 1964* for all qualified persons except those who are Aboriginal natives of Australia. Aborigines, although entitled to enrol, are not required to do so. Voting at elections is on the preferential system and, as provided by the foregoing Act, is compulsory for all enrolled persons.

The *Electoral Districts Act Amendment Act 1975* redefined for electoral purposes the boundaries of the Metropolitan Area and within that area increased the numbers of electoral provinces to six, and electoral districts to twenty-seven.

#### ELECTORAL PROVINCES AND ELECTORAL DISTRICTS

Electoral province	Component electoral districts	Electoral province	Component electoral districts
METROPOLITAN AREA			
East Metropolitan	Ascot Canning Victoria Park Welshpool	North-East Metropolitan	Dianella Maylands Morley Mount Lawley Swan
Metropolitan	Cottesloe Floreat Nedlands Perth Subiaco	South Metropolitan	Cockburn East Melville Fremantle Melville
North Metropolitan	Balcatta Karrinyup Mount Hawthorn Scarborough Whitford	South-East Metropolitan	Clontarf Gosnells Murdoch South Perth

ELECTORAL PROVINCES AND ELECTORAL DISTRICTS — *continued*

Electoral province	Component electoral districts	Electoral province	Component electoral districts
AGRICULTURAL, MINING AND PASTORAL AREA			
Central	Avon Mount Marshall Narrogin	South-East	Kalgoorlie Merredin Yilgarn-Dundas
Lower Central	Collie Katanning Warren	South-West	Bunbury Vasse Wellington
Lower West	Dale Murray Rockingham	Upper West	Geraldton Greenough Moore
South	Albany Roe Stirling	West	Darling Range Kalamunda Mundaring
NORTH-WEST — MURCHISON-EYRE AREA			
Lower North	Gascoyne Murchison-Eyre	North	Kimberley Pilbara

Complementary legislation in the *Constitution Acts Amendment Act (No. 2) 1975* increased the membership of the Legislative Council to thirty-two and the Legislative Assembly to fifty-five members. The increased representation in the Legislative Council became effective from 21 May 1977 and in the Legislative Assembly following the elections held in February 1977.

The composition of the Legislative Council at 30 June 1981 is given in the following table.

## MEMBERS OF THE LEGISLATIVE COUNCIL AT 30 JUNE 1981

Name	Political party	Electoral province
DUE TO RETIRE IN 1983 (a)		
Baxter, Hon. Norman Eric	N.C.P.	Central
Dans, Hon. Desmond Keith	A.L.P.	South Metropolitan
Elliott, Hon. Lyla Daphne	A.L.P.	North-East Metropolitan
Ferry, Hon. Victor Jasper, D.F.C.	Lib.	South-West
Griffiths, Hon. Clive Edward	Lib.	South-East Metropolitan
Leeson, Hon. Ronald Thomas	A.L.P.	South-East
McKenzie, Hon. Fred Evan	A.L.P.	East Metropolitan
McNeil, Hon. Thomas	N.P.	Upper West
McNeill, Hon. Neil, B. Sc. (Agric.)	Lib.	Lower West
Moore, Hon. Norman Frederick, B.A., Dip. Ed.	Lib.	Lower North
Oliver, Hon. Oscar Neil Blackburne, E.D.	Lib.	West
Piesse, Hon. Winifred Margaret, J.P.	N.C.P.	Lower Central
Pike, Hon. Robert Gerald	Lib.	North Metropolitan
Williams, Hon. Richard John Lloyd, B.A.	Lib.	Metropolitan
Withers, Hon. William Robert	Lib.	North
Wordsworth, Hon. David John	Lib.	South
DUE TO RETIRE IN 1986 (a)		
Berinson, Hon. Joseph Max, LL.B.	A.L.P.	North-East Metropolitan
Brown, Hon. James McMillan	A.L.P.	South-East
Dowding, Hon. Peter McCallum, LL.B.	A.L.P.	North
Gayfer, Hon. Harry Walter	N.C.P.	Central





Photography Copyright A. G. Wells

PLATE 1 — WOILIE  
(*Bettongia penicillata*)

The Woilie or brush-tailed rat kangaroo is considered rare and afforded special protection under the *Wildlife Conservation Act 1950-1980*.



PLATE 2 — UNDERGROUND ORCHID  
(*Rhizanthella gardneri*)

This extraordinary plant is one of only two subterranean orchid species known in the world. The underground habit of this orchid makes it difficult to find and many aspects of its biology remain a mystery.

S. D. Hopper

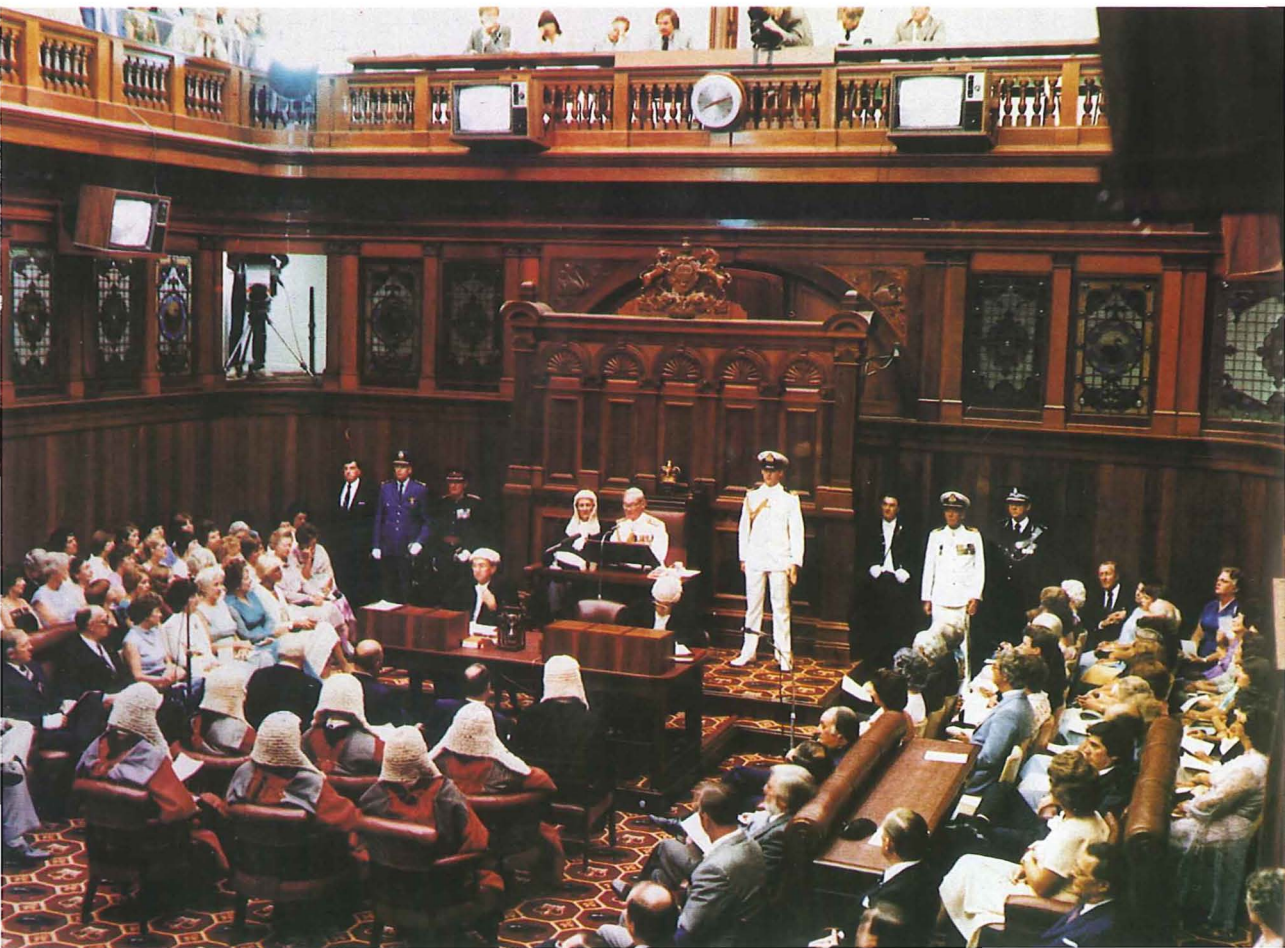




PLATE 3 — Painting by Owen Garde depicting the first sitting of the Legislative Council on 7 February 1832. *Government Printer*

PLATE 4 — Special 150th Anniversary joint sitting of both Houses of Parliament in the Legislative Council Chamber on 8 February 1982.

*Government Printer*





MEMBERS OF THE LEGISLATIVE COUNCIL AT 30 JUNE 1981 — *continued*

Name	Political party	Electoral province
Hetherington, Hon. Robert, B.A.	A.L.P.	East Metropolitan
Knight, Hon. Thomas, A.F.A.I.M., A.A.I.B.	Lib.	South
Lewis, Hon. Alexander Ashley	Lib.	Lower Central
Lockyer, Hon. Philip Harry	Lib.	Lower North
MacKinnon, Hon. Graham Charles, C.M.G.	Lib.	South West
Masters, Hon. Gordon Edgar	Lib.	West
McAleer, Hon. Margaret	Lib.	Upper West
Medcalf, Hon. Ian George, E.D., Q.C.	Lib.	Metropolitan
Olney, Hon. Howard William, Q.C., LL.B.	A.L.P.	South Metropolitan
Pendal, Hon. Phillip George	Lib.	South-East Metropolitan
Pratt, Hon. Ian George	Lib.	Lower West
Wells, Hon. Peter Henry	Lib.	North Metropolitan

A.L.P. = Australian Labor Party. N.C.P. = National Country Party.  
 Lib. = The Liberal Party of Australia (Western Australian Division) Incorporated.  
 N.P. = National Party. Ind. = Independent.

(a) Section 8 of the *Constitution Acts Amendment Act 1899-1980* provides that a retiring member shall vacate his seat on 21 May in the year of retirement.

**The Legislative Assembly**

The following table shows the composition of the Legislative Assembly at 30 June 1981.

## MEMBERS OF THE LEGISLATIVE ASSEMBLY AT 30 JUNE 1981

Name	Political party	Electoral district
Barnett, Michael	A.L.P.	Rockingham
Bateman, Thomas Henry	A.L.P.	Canning
Bertram, Ronald Edward, A.A.S.A.	A.L.P.	Mt Hawthorn
Blaikie, Barry Roy	Lib.	Vasse
Bridge, Ernest Francis	A.L.P.	Kimberley
Bryce, Malcolm John, B.A.	A.L.P.	Ascot
Burke, Brian Thomas	A.L.P.	Balcatta
Burke, Terence Joseph	A.L.P.	Perth
Carr, Jeffrey Phillip, B.A.	A.L.P.	Geraldton
Clarko, James George, A.E., B.A., Dip. Ed., M.A.C.E., J.P.	Lib.	Karrinyup
Court, Hon. Sir Charles Walter Michael, K.C.M.G., O.B.E.	Lib.	Nedlands
Cowan, Hendy John	N.P.	Merredin
Coyne, Peter Joseph Aloysius	Lib.	Murchison-Eyre
Craig, Hon. Margaret June	Lib.	Wellington
Crane, Albert Victor	N.C.P.	Moore
Dadour, Gabriel Thomas, Dr, M.B., B.S.	Lib.	Subiaco
Davies, Hon. Ronald	A.L.P.	Victoria Park
Evans, Hon. Hywel David, B.A.	A.L.P.	Warren
Grayden, Hon. William Leonard	Lib.	South Perth
Grewar, Geoffrey Royden, B.Sc. (Agric.), J.P.	Lib.	Roe
Grill, Julian Fletcher, LL.B.	A.L.P.	Yilgarn-Dundas
Harman, John Joseph	A.L.P.	Maylands
Hassell, Hon. William Ralph Boucher, LL.B., M.A.	Lib.	Cottesloe
Herzfeld, Thomas Alexander Albert, B.E. (Hons.), (M.I.E.) Aust.	Lib.	Mundaring
Hodge, Barry James	A.L.P.	Melville
Jamieson, Hon. Colin John	A.L.P.	Welshpool
Jones, Hon. Peter Vernon	N.C.P.	Narrogin
Jones, Thomas Henry	A.L.P.	Collie
Laurance, Hon. Ian James, B.A.	Lib.	Gascoyne
MacKinnon, Hon. Barry John, B.E., A.A.S.A.	Lib.	Murdoch

MEMBERS OF THE LEGISLATIVE ASSEMBLY AT 30 JUNE 1981 — *continued*

Name	Political party	Electoral district
McIver, Kenneth Finlay	A.L.P.	Avon
McPharlin, Walter Raymond, J.P.	N.P.	Mt Marshall
Mensaros, Hon. Andrew	Lib.	Floreat
Nanovich, Michael	Lib.	Whitford
O'Connor, Hon. Raymond James	Lib.	Mt Lawley
Old, Hon. Richard Charles	N.C.P.	Katanning
Parker, David Charles, B.A.	A.L.P.	Fremantle
Pearce, Robert John, B.A., Dip. Ed.	A.L.P.	Gosnells
Rushton, Hon. Edgar Cyril	Lib.	Dale
Shalders, Richard Steele	Lib.	Murray
Sibson, John	Lib.	Bunbury
Skidmore, John Edward	A.L.P.	Swan
Sodeman, Brian	Lib.	Pilbara
Spriggs, George Clarence Charles	Lib.	Darling Range
Stephens, Matthew Ernest	N.P.	Stirling
Taylor, Hon. Alexander Donald, B.A.	A.L.P.	Cockburn
Taylor, Ian Frederick, B.Ec. (Hons.)	A.L.P.	Kalgoorlie
Thompson, Hon. Ian David	Lib.	Kalamunda
Tonkin, Arthur Raymond, B.A., Dip. Ed.	A.L.P.	Morley
Trethowan, Anthony Markham, B.A., F.A.I.M., F.Inst.D.	Lib.	East Melville
Tubby, Reginald John	Lib.	Greenough
Watt, Leon Harold	Lib.	Albany
Williams, Rex Geoffrey, A.A.I.M.	Lib.	Clontarf
Wilson, Keith James	A.L.P.	Dianella
Young, Hon. Raymond Laurence, F.C.A.	Lib.	Scarborough

## SUMMARY

Australian Labor Party (A.L.P.)	23
National Country Party (N.C.P.)	3
National Party (N.P.)	3
The Liberal Party of Australia (Western Australian Division) Incorporated (Lib.)	26

At 30 June 1981 there were fifty-five members of the Legislative Assembly, each member representing one of the fifty-five electoral districts into which the State was divided for the purpose. Members are elected for the duration of the Parliament, which is limited to three years.

A candidate for election must have resided in Western Australia for twelve months, be at least eighteen years of age, be a natural-born or naturalised British subject, and be enrolled or qualified for enrolment as an elector at Legislative Assembly elections. No person is qualified to be a Member of the Legislative Assembly if he is a Member of the Legislative Council, a Judge of the Supreme Court, the Sheriff of Western Australia, an undischarged bankrupt, a debtor against whose estate there is a subsisting order in bankruptcy, or has been attainted or convicted of treason or felony.

The qualifications and disqualifications applying to enrolment as an elector of the Legislative Assembly are the same as those prescribed for electors of the Legislative Council and enumerated in the preceding section *The Legislative Council*. As provided by the *Electoral Amendment Act 1919* enrolment is compulsory for all qualified persons except those who are Aboriginal natives of Australia. Aborigines, although entitled to enrol, are not required to do so. Voting at elections is on the preferential system and is compulsory for all enrolled persons as provided by the *Electoral Act Amendment Act 1936*.

## ELECTIONS

**The Federal Parliament**

General elections for the Federal Parliament were held on 18 October 1980. The Liberal-National Country Party coalition, led by the Honourable J. M. Fraser, was elected to office with a majority of twenty-three seats in the House of Representatives.

Liberal-National Country Party coalition representation in the Senate as a result of the elections was reduced from thirty-five to thirty-one.

**The State Parliament**

At the conjoint election for the Legislative Council and the Legislative Assembly held on 23 February 1980, the Liberal Party-Country Party alliance, led by the Honourable Sir Charles Court, K.C.M.G., O.B.E., was elected to office with a majority in the Legislative Assembly of nine seats.

## LEGISLATION DURING 1980

During the first session of the thirtieth Parliament, which lasted from 31 July to 29 November 1980, the Western Australian legislature enacted ninety-seven Public Statutes and, in addition, dealt with eight Bills which were introduced but not passed.

The titles and a brief summary of the Acts passed by the State Parliament during 1980 are given below. The full text of the legislation enacted is contained in the volumes of *The Acts of the Parliament of Western Australia*, to which reference should be made if further details are required.

## ACTS PASSED DURING 1980

No. of Act	Short title and summary
8	Aboriginal Heritage Amendment Act (No. 2).
48	Acts Amendment (Motor Vehicle Pools) Act. Amends the <i>Transport Act 1966-1979</i> , the <i>Road Traffic Act 1974-1979</i> and the <i>Taxi-cars (Co-ordination and Control) Act 1963-1978</i> .
96	Acts Amendment (Strict Security Life Imprisonment) Act. Amends the <i>Prisons Act 1903-1979</i> , the <i>Offenders Probation and Parole Act 1963-1977</i> and <i>The Criminal Code</i> .
50	Acts Amendment (Transport) Act. Amends the <i>State Transport Co-ordination Act 1966</i> , and the <i>Taxi-cars (Co-ordination and Control) Act 1963-1978</i> .
14	Administration Amendment Act.
85	Adoption of Children Amendment Act.
22	Agriculture and Related Resources Protection Amendment Act.
90	Appropriation Act (Consolidated Revenue Fund).
91	Appropriation Act (General Loan Fund).
59	Banana Industry Compensation Trust Fund Amendment Act.
43	Bee Industry Compensation Amendment Act.
44	Beekeepers Amendment Act.
19	Broken Hill Proprietary Company Limited Agreements (Variation) Act. Varies agreements between the State of Western Australia and the Broken Hill Proprietary Company Limited, Australian Iron & Steel Proprietary Limited and Dampier Mining Company Limited relating to certain additional steel processing obligations.
32	Business Franchise (Tobacco) Amendment Act.
24	Cancer Council of Western Australia Amendment Act.
41	Cemeteries Amendment Act.
13	Change of Names Regulations Amendment Act.
38	Chiropractors Amendment Act.
2	City of Perth Endowment Lands Amendment Act.
62	Coal Mine Workers (Pensions) Amendment Act.
36	Colleges Amendment Act.
83	Company Take-overs Amendment Act.
5	Constitution Amendment Act.
4	Constitution Amendment Act (No. 2).

ACTS PASSED DURING 1980 — *continued*

No. of Act	Short title and summary
15	Constitution Amendment Act (No. 3).
66	Consumer Affairs Amendment Act.
75	Country Areas Water Supply Amendment Act.
45	Dairy Industry Amendment Act.
94	Dental Amendment Act.
49	Door to Door (Sales) Amendment Act.
52	Electoral Amendment Act.
78	Environmental Protection Amendment Act.
7	Essential Foodstuffs and Commodities Amendment Act.
35	Firearms Amendment Act.
61	Foreign Judgments (Reciprocal Enforcement) Amendment Act.
17	Government Employees (Promotions Appeal Board) Amendment Act.
77	Government Railways Amendment Act.
37	Hire-Purchase Amendment Act.
88	Hire-Purchase Amendment Act (No. 2).
64	Hospitals Amendment Act.
58	Housing Act. Preserves and continues The State Housing Commission established under the <i>State Housing Act 1946-1975</i> . Makes better provision for housing and improving housing standards and conditions in the State. Encourages the use of land for housing. Enables the State to make financial arrangements with the Commonwealth for housing purposes. Repeals the <i>State Housing Act 1946-1975</i> .
82	Industrial Arbitration Amendment Act.
55	Industrial Lands Development Authority Amendment Act.
86	Industrial Training Amendment Act.
79	Industry (Advances) Amendment Act.
67	Justices Amendment Act.
65	Land Amendment Act.
97	Land Amendment Act (No. 2).
29	Land Tax Assessment Amendment Act.
39	Liquefied Petroleum Gas Subsidy Act. Subsidises the cost of liquefied petroleum gas and other eligible gas when used for eligible purposes as specified in the Act.
92	Loan Act. Authorises the raising of \$70,000,000 by loan for the construction of certain public works and for other purposes.
68	Local Government Amendment Act.
76	Local Government Superannuation Act. Establishes the Local Government Superannuation Board and Local Government Superannuation Fund. Makes provision for a superannuation scheme for employees of corporations established under the <i>Local Government Act 1960</i> and other specified bodies. Repeals the <i>Superannuation, Sick, Death, Insurance, Guarantee and Endowment (Local Governing Bodies' Employees) Funds Act 1947-1975</i> .
21	Main Roads Amendment Act.
31	Marine Navigational Aids Amendment Act.
25	Metropolitan (Perth) Passenger Transport Trust Amendment Act.
30	Metropolitan Region Town Planning Scheme Amendment Act.
73	Metropolitan Region Town Planning Scheme Amendment Act (No. 2).
3	Metropolitan Water Supply, Sewerage, and Drainage Amendment Act.
46	Mine Workers' Relief Amendment Act.
26	Murdoch University Amendment Act.
60	National Companies and Securities Commission (State Provisions) Act. Provides for the operation of the National Companies and Securities Commission in the State. Gives effect in Western Australia to a national scheme for co-operative legislation by the Commonwealth and the States to establish a uniform system of law and administration regulating companies and the securities industry.
87	Nurses Amendment Act.
89	Occupational Therapists Registration Act. Establishes the Occupational Therapists Registration Board. Provides for the registration and training of persons as occupational therapists. Repeals the <i>Occupational Therapists Act 1957-1976</i> .

ACTS PASSED DURING 1980 — *continued*

No. of Act	Short title and summary
54	Parliamentary Superannuation Amendment Act.
70	Perpetual Trustees W.A. Ltd., Amendment Act.
93	Pharmacy Amendment Act.
71	Police Amendment Act.
18	Public Service Amendment Act.
20	Railways Discontinuance Act. Authorises the discontinuance of 403 kilometres of railway between Pindar and Meekatharra.
74	Real Estate and Business Agents Amendment Act.
84	Recording of Proceedings Act. Makes provision for recording oral proceedings in and before tribunals as defined in the Act and makes provision for the custody of certain records made under the Act. Repeals the <i>Recording of Evidence Act 1975</i> and Part XVII of the <i>Acts Amendment (Master, Supreme Court) Act 1979</i> .
69	Reserve (Port Denison Suburban Lots 6 and 6A) Act. Enables a Crown Grant of the said lands to be made to the West Australian Temperance Alliance Incorporated in trust for a site for a temperance institution.
95	Reserves Act. Alters the purpose of certain Class 'A' Reserves.
42	Road Traffic Amendment Act.
81	Road Traffic Amendment Act (No. 2).
33	Rural and Industries Bank Amendment Act.
57	Rural Industries Assistance Amendment Act.
23	Rural Reconstruction and Rural Adjustment Schemes Amendment Act.
27	Rural Relief Funds Act Repeal Act. Repeals the <i>Rural Relief Fund Act 1935-1947</i> .
28	Rural Youth Movement Amendment Act.
34	Salaries and Allowances Tribunal Amendment Act.
56	Skeleton Weed (Eradication Fund) Amendment Act.
11	Slaughter of Calves Restriction Act Repeal Act. Repeals the <i>Slaughter of Calves Restriction Act 1919</i> .
12	Stallions Act Repeal Act. Repeals the <i>Stallions Act 1921-1947</i> .
63	Stamp Amendment Act.
9	Stock (Brands and Movement) Amendment Act.
1	Supply Act. Grants supply of \$875 million for the year 1980-81, and \$35 million for the purpose of temporary advances.
10	Taxi-cars (Co-ordination and Control) Amendment Act.
6	The Bank of Adelaide (Merger) Act. Supplements The Bank of Adelaide (Merger) Act, 1980 of the State of South Australia which provides for the transfer to Australia and New Zealand Banking Group Limited of the undertaking of the Bank of Adelaide, and similarly for their respective savings banks.
72	Town Planning and Development Amendment Act.
47	Transport Amendment Act.
16	Waterways Conservation Amendment Act.
40	Western Australian Marine Amendment Act.
51	Western Australian Overseas Projects Authority Amendment Act.
53	Wildlife Conservation Amendment Act.
80	Workers' Compensation Supplementation Fund Act. Establishes the Workers' Compensation Supplementation Fund from which employers who are liable to pay compensation to employees may be assisted in instances where the employers' insurer is unable to reimburse the employer.

## GOVERNMENT ADMINISTRATION

## State Government

The Public Service of Western Australia operates under the provisions of the *Public Service Act 1978* and consists of a number of departments established in accordance with the regulations made under the Act. The departments are Aboriginal Affairs Planning Authority, Agriculture, Audit, Chief Secretary's, Community Welfare, Conservation and Environment, Corrections, Crown Law, Education, Electoral, Fisheries and Wildlife, Forests, Harbour and Light, Hospital and Allied Services, Industrial Development and Commerce, Labour and Industry, Lands and

Surveys, Local Government, Medical, Mental Health Services, Metropolitan Water Supply, Sewerage, and Drainage Board, Mines, Police, Premier's, Public Health, Public Service Board, Public Works, Resources Development, Road Traffic Authority, State Government Insurance Office, State Housing Commission, State Taxation, Tourism, Town Planning, Treasury, Workers' Compensation Board and Youth, Sport and Recreation.

Other parts of the State Service normally referred to as Statutory Authorities or Instrumentalities, function under separate Acts although they very largely follow the conditions prescribed in the Public Service Act.

Establishment, abolition or reorganisation of departments are subject to the approval of the Governor.

### **Australian Government**

A comprehensive guide to the organisation and functions of the Australian Government is given in the *Commonwealth Government Directory*, including an outline of the activities of each Department of State together with similar information concerning Boards, Committees, Councils, Commissions and other Instrumentalities. A list of Australian Government Departments, the principal matters dealt with by each Department, and details of the statutes administered by the relevant Federal Minister are published from time to time in the *Australian Government Gazette* as, for example, in the issue dated 12 September 1979.

## **HISTORY OF STATE GOVERNMENT DEPARTMENTS**

A short but reasonably comprehensive history of State Government Departments was commenced in the 1971 issue of the Year Book. The following article, the eleventh in the series, presents the historical development of the Treasury Department. Departments dealt with in previous articles were the Public Works Department, the Education Department, the Police Department, the Premier's Department, the Department of Tourism, the Forests Department, the Department of Mines, the Department of Agriculture, the Department of Lands and Surveys and the Department for Community Welfare.

### **TREASURY DEPARTMENT**

The principal role of Treasury is to advise the Government of the day on financial and economic matters and to manage the State's finances. The scope and complexity of this task has been increased not only by the manner in which Commonwealth-State financial relations developed following Federation in 1901 but also by changes in the role and complexity of Government over the years.

These changes are reflected in the continued growth in the State's finances; in 1891 the expenditure from the Consolidated Revenue Fund was less than \$1 million whereas by 1979-80 this expenditure had reached \$1,600 million.

In its role as manager of the finances of the State Government, the Treasury is responsible for the preparation of the State Budget within the guidelines and policies laid down by the Government of the day and for the monitoring and control of departmental expenditure authorised by Parliamentary appropriations.

Treasury maintains aggregate accounts for the whole of Government operations and is responsible for the design of accounting procedures and the preparation of statutory accounting statements. Currently, Treasury is also responsible for the development of a computer-based central accounting system and the conversion of government accounting to the new system.

Prior to 1 July 1970 the Treasury was responsible for collecting State taxes including stamp duty and betting taxes. On that date the State Taxation Department commenced operations and assumed responsibility for the collection of State taxes. Simultaneously, the head of the Treasury Department became known as the Under Treasurer, instead of Under Treasurer and Commissioner of Stamps.

In addition to these responsibilities, Treasury is heavily involved from day to day in matters relating to Commonwealth-State financial relations and activities associated with the Australian Loan Council including loan raising and debt management and co-ordination of borrowings by State Authorities.

The history of the State Treasury is closely linked with the development of the Australian federal system and the changing pattern of Commonwealth transfer payments to the States. Over the years since Federation, the Treasury has been responsible for negotiations by the State at officer level for preparation of submissions and advice to Government on all significant developments affecting the financial structure of the Federation.

When the colony of Western Australia was proclaimed in 1829, financial control was the responsibility of the Colonial Secretary's Department which dealt with most official matters. Peter Nicholas Broun<sup>(1)</sup>, who was appointed Secretary of the Colony in 1829, was the first Acting Treasurer. However, by 1832 increased responsibilities in the financial area led to the appointment of John Lewis to the position of Colonial Treasurer.

Government finances played a crucial part in the constitutional development of Western Australia. The Australian Colonies Government Act of 1850 provided for the introduction of self government to the colonies but the Secretary of State for the Colonies had advised that representative government would not be granted to Western Australia until the colony could finance its total expenditure from its own revenue sources. This condition was not met until 1870.

Responsible government became effective in Western Australia in 1890 and established the framework within which Treasury has since operated. The Constitution Act of 1889, gave the government of Western Australia control over public funds, enabling Parliamentary appropriation of the public revenues of the colony subject to endorsement by the Governor in Executive Council. The Audit Act of 1891 extended the principles of accountability of Government appropriations initiated by the Constitution Act and provided for audit of the Treasurer's Accounts.

In 1890 the Premier, the Honourable John Forrest, was sworn in as Colonial Treasurer of Western Australia. The tradition of the Premier taking the Treasury portfolio has been departed from in only four of the subsequent twenty-four ministries and for the first seven months of the Tonkin Ministry in 1971.

In the early years of responsible government, Treasury provided clerical assistance for the Premier and, from its establishment in 1898 until 1901, the Premier's Department was a sub-department of Treasury. The close working relationship between the two departments has continued over the years.

The first Under Treasurer was Laurence Stirling Eliot and his long term in office from 1891 to 1912 coincided with a period of rapid economic growth and major constitutional change. The decade before Federation was one of rapid progress and prosperity for Western Australia. The rich gold fields of Coolgardie and Kalgoorlie were discovered in 1892-93 and led to some diversification of the predominantly rural economy. The increased economic activity generated a demand for developmental works and, in 1891, Parliament authorised flotation in London on a loan of \$2,672,000.

Between 1891 and 1901 Western Australia's population grew from 49,782 to 184,124. In the Budget for 1891, expenditure from the Consolidated Revenue Fund was \$871,246 whereas by the year ending 30 June 1900 expenditure from the Fund had reached \$5,231,349, six times the level ten years earlier. The increased workload in Treasury is reflected in the growth in staff numbers from 28 in 1891 to 108 by June 1900, the most significant increase being in the number of sub-collectors of revenue.

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<sup>(1)</sup> In early records the name is spelt 'Brown' although the signatures on documents are always 'Peter Broun', the family being of French origin.

Prior to the decision of the six colonies to federate and form the Commonwealth of Australia from 1 January 1901, the colony of Western Australia was dependent for its taxation revenue on various forms of licences, customs, excise and stamp duties, probate and dividend duties. Other revenues came in the form of land sales, rents, mineral leases and public utility charges. However, from the earliest days of the colony customs and excise duties constituted by far the most important source of tax revenue, representing in 1899-1900 88 per cent of tax revenue and 32 per cent of total revenue. With Federation, this avenue of taxation passed to the Commonwealth.

The fact that revenue from customs and excise duties was responsible for a large part of the colonies' revenue before Federation led to the inclusion of the Braddon Clause which provided for the repayment to the States of surplus Commonwealth revenue. This Clause allowed only one-quarter of net revenue to be used by the Commonwealth for its own expenditure for the first ten years after Federation, with the remainder to be returned to the States for that period. The Braddon Clause was succeeded by the Surplus Revenue Act of 1910.

During the seventeen years for which this arrangement lasted, the financial position of the States deteriorated relative to the Commonwealth. In those years the Commonwealth entered into the field of direct taxation in competition with the States, introducing a Land Tax in 1910, enacting the Estate Duty Act in 1914 and the Income Tax Act in 1915. Thus Western Australia, which in 1907 had introduced an Income Tax at the rate of four pence in every pound sterling as well as a Land Tax at the rate of one penny for every pound sterling of the unimproved value, found these avenues of revenue restricted by the intrusion of the Commonwealth into what had hitherto been State revenue fields.

Negotiations on new financial arrangements for the States continually broke down until finally the matter was submitted to referendum whereby the Constitution was amended to allow for the Financial Agreement of 1927. This Agreement provided for Commonwealth assistance towards State debts and for the establishment of the Australian Loan Council.

Before 1927, States were responsible for their own borrowing programmes. The establishment of the Australian Loan Council enabled the co-ordination of Australian Government borrowing. The Loan Council was given the power to determine the total borrowing to be undertaken by the Commonwealth and the States, the terms and conditions under which funds were to be raised and the allocation between the parties of the total borrowing programme. Under the Gentlemen's Agreement, concluded in 1936, these arrangements were later extended to control of borrowings by semi-governmental and local authorities for which State Treasuries assumed a co-ordinating role.

In most years after Federation, Western Australia had received extra financial assistance because of the State's relatively undeveloped economy. Tasmania had been in receipt of special grants since 1912 and South Australia since 1929-30. In 1933 the Commonwealth formalised the procedure for applications for these special grants by setting up a permanent body — the Commonwealth Grants Commission.

In each year from 1934-35 until Western Australia ceased to be claimant State in 1968, the Treasury was responsible for co-ordinating and presenting Western Australia's case to the Commonwealth Grants Commission. The rapid economic development of the 1960s, resulted in a marked increase in the State's financial capacity and enabled Western Australia to cease to be a claimant State in 1968. The significance of the Special Grants to Western Australia during the thirty-four years of claimancy is shown by the total amount received in Special Grants from 1942 to 1968. In that period the State received \$311 million from this source which represented approximately 26 per cent of the total general purpose assistance paid by the Commonwealth to Western Australia during that time.

One of the major changes in Commonwealth-State financial relations occurred during the Second World War when, to finance the national war effort, the Commonwealth Government



took exclusive power to levy income tax for the period of the war and one year thereafter. As compensation to the States for vacating the field, the Commonwealth made payments to them under the *States Grants (Income Tax Reimbursement) Act 1942*. The grants to each State were equal to their average receipts from income taxation during 1939-41.

At the Premiers' Conference in 1946 the Prime Minister informed the States that the Commonwealth proposed to continue uniform taxation after the war and a new Act was introduced to revise the basis for determining what were then known as Taxation Reimbursement Grants. From this Act and its subsequent amendments grew the system of Financial Assistance Grants which constituted the greater part of the general purpose assistance from the Commonwealth and historically the major portion of the total payments from the Commonwealth.

As from 1976-77 the system of Financial Assistance Grants was replaced by arrangements under which the States receive a fixed percentage of the total amount of personal income tax collected by the Commonwealth in the previous year, subject to certain guarantees with respect to minimum rates of increase in funds. The importance of these arrangements can be gauged from the fact that revenue received from them constitutes approximately 45 per cent of this State's total revenue, excluding revenue from public utilities. The arrangements are subject to review before the end of 1980-81.

The Personal Income Tax Sharing arrangements provide that the relativities between the individual State's shares of the tax sharing pool are to be reviewed periodically, with the first review to be made before 30 June 1981. A special Division of the Commonwealth Grants Commission was constituted to undertake the review and Treasury was responsible for the preparation and co-ordination of the State's submissions to the Commission and for the presentation of the State's case.

A further development in Commonwealth-State financial arrangements over the last decade has been the dramatic growth in the importance of specific purpose payments from the Commonwealth. In 1979-80 revenue from specific purpose payments comprised 22 per cent of the total revenue from the Commonwealth paid into the Consolidated Revenue Fund. The Treasury acts as a co-ordinator and 'clearing house' for all dealings with the Commonwealth relating to specific purpose payments.

The importance of total funds received from the Commonwealth is apparent in the 1979-80 Consolidated Revenue Fund Budget. Excluding revenue from Public Utilities, 22 per cent of total revenue in that year was from various State taxes, 5 per cent from mining royalties and 14 per cent from other territorial and departmental revenue compared with 59 per cent from the Commonwealth.

Throughout the post-war period, progressive changes in the structure of Commonwealth transfer payments to the States required a continuing and heavy involvement by the State Treasury in the preparation of submissions either by Western Australia alone or jointly with the other States, and in detailed discussions and negotiations with the State's partners in the Federation and with the Commonwealth. The field of Commonwealth-State financial relations has been and continues to be a primary responsibility of the Treasury and one of its key roles in the overall State administration.

In keeping with developments in this field and in the scope and complexity of Government a number of changes have occurred since Federation in the structure and role of Treasury and this State has adopted an innovative role in the public finance area. Only the more important changes can be mentioned in this chapter but no history would be complete without also making reference to the distinguished contributions of three long-serving Under Treasurers — Mr L. S. Eliot, Mr A. J. Reid (later Sir Alex) and Mr K. J. Townsing.

Mr L. S. Eliot, C.M.G., I.S.O., was the first Under Treasurer and served in that capacity under ten different Treasurers for a period of twenty-one years from 1891 to 1912. Mr Eliot

was entrusted with the flotation of the first State loan for \$70,000, the redemption of which he later saw completed. In 1902, after the inauguration of the Commonwealth, he received the additional appointment of Permanent Head of the Commonwealth Sub-Treasury.

Sir Alexander Reid, C.M.G., I.S.O., who received his knighthood in 1958, served as Under Treasurer for a period of sixteen years from 1938 to 1954. In 1934 he and John Curtin (a journalist who was to become Prime Minister of Australia in 1941) were responsible for the preparation and presentation of the State's first claim to the Commonwealth Grants Commission. From 1935 Sir Alex appeared before the Commission as the principal advocate for Western Australia and in October 1954, following his retirement as Under Treasurer, he was appointed a member of the Commonwealth Grants Commission in which position he served for eleven years.

Mr K. J. Townsing, C.M.G., I.S.O., has the distinction of serving in two senior positions in the Public Service. He was promoted from Deputy Under Treasurer to Public Service Commissioner in January 1958 and returned to the Treasury as Under Treasurer in June 1959, a position which he occupied until his retirement sixteen years later in June 1975. Mr Townsing was noted for several important innovative measures.

The enactment of the Public Moneys Investment Act in 1961 enabled interest earned on short term money investments to provide a valuable addition to the revenues of the State. Treasury is responsible for investing moneys standing to the credit of the Public Account in the short-term money market and the interest on these investments has increased from less than \$1 million in 1961-62 to \$24.3 million in 1979-80.

In 1966 Mr Townsing was also responsible for the introduction by the Western Australian Government of an *ad valorem* receipts duty, a move followed by other States.

The tax was subsequently ruled by the High Court of Australia to be a duty of excise and therefore not within the constitutional powers of the States. However, the States retained the additional revenue derived from this measure as the Commonwealth subsequently agreed to add corresponding amounts to the States' Financial Assistance Grants in subsequent years to compensate for the revenue lost as a result of the Court's decision.

It was also during Mr Townsing's term of office that the State achieved the financial strength that enabled the decision to be taken for Western Australia to cease being a claimant State.

Mr Townsing retired in June 1975 and was succeeded by the present Under Treasurer, Mr L. E. McCarrey.

The advent of computers saw the establishment in Treasury in 1967 of the Automatic Data Processing Centre which was a service bureau for all commercial computing throughout the Public Service. With the growth of computers throughout the Service from the mid-1970s, the Centre assumed an additional advisory and co-ordinating role and in January 1979 an Information Systems and Computer Services Division was established to provide advisory and consulting services to public sector organisations.

An historic development for the States occurred in June 1978 when, following proposals put forward by Sir Charles Court, the present Premier and Treasurer of Western Australia, Loan Council adopted new guidelines for special additions to larger authorities' borrowing programmes for financing infrastructure for major development projects. As Western Australia was about to enter a new phase of resource development, the new tier of borrowings was sought to provide the State with the extra capacity to provide the associated infrastructure.

The Treasury is responsible for the preparation and submission of proposals to Loan Council for special borrowings under the new guidelines, providing evidence as to the viability of the proposed project, its special significance to the economic development of Australia and its importance. Where Loan Council approves of a special addition, if the funds are not available in Australia the government concerned may seek approval to borrow overseas. This is the first time since the Gentlemen's Agreement came into effect in 1936 that State authorities have been

able to raise money overseas and this development has added a new and important responsibility to the role of Treasury which is required to co-ordinate and supervise all approaches to overseas markets by State authorities.

At 1 July 1980 the Treasury had a total staff of 263 of which 106 were employed in the Government Computing Division which services all departments and authorities of Government. The present divisional structure of the Treasury is as follows:

**Executive.** Overall control of Treasury functions and provision of advice to the Premier and Treasurer.

**Policy and Research.** Commonwealth-State financial relations, co-ordination of infrastructure financing proposals, analysis of various policy proposals, revenue research, preparation of periodic reports on the economy and discussion papers and evaluation of major projects.

**Budgeting, Loans and Investment, Inspectorate.** Preparation and control of the State Consolidated Revenue Fund and Capital Works budgets, co-ordination of Commonwealth-State specific purpose grant programmes and monitoring and review of departmental budgets.

Co-ordination and administration of borrowing programmes.

Ensuring accounting and financial management information systems comply with various Acts and Regulations, Government policy, accounting standards and modern practices and investigating and reporting on matters raised by the Auditor General.

**Industry and Welfare.** Investigation of and recommending on applications for Government assistance by various bodies, including charitable and welfare agencies, assistance to the rural sector and other industries, Government guarantees.

**Government Computing.** Provides consultancy and bureau facilities to State departments and instrumentalities. Investigates investment proposals for data processing in the Government sector. Co-ordinates introduction of interdepartmental systems. Define standards to be maintained in the development of departmental and interdepartmental computing systems.

**Administration and Accounting.** Maintenance of Public Accounts and financial transactions of the State Government, administration of staff, including payment of salaries and training, control of departmental records and natural disaster relief programmes.

Included in the overall functional responsibility of the Treasury are the State Superannuation Board, Government Stores Department and the Government Printing Office which, although categorised as sub-departments of the Treasury, operate largely as separate entities.

## THE JUDICATURE

The two major factors in the development of the Australian legal system have been its British origin and the Commonwealth Constitution of 1900. This statute, an Act of the Imperial Parliament in London, limited the legislative power of State Parliaments in some respects and created a federal legislature. Since 1942, however, the Imperial Parliament can legislate for Australia only at Australia's request. The sources of Australian law of today are, therefore, found in Commonwealth and State legislation, in some Imperial legislation, and in the common law. Independence of the judiciary is an essential part of the Australian legal system.

Listed below are members of the Western Australian judiciary.

### *Supreme Court of Western Australia*

Chief Justice	The Honourable Sir Francis Burt, K.C.M.G.
Senior Puisne Judge	The Honourable J. L. C. Wickham
Puisne Judges	The Honourable A. R. A. Wallace
	The Honourable R. E. Jones
	The Honourable P. F. Brinsden
	The Honourable C. H. Smith
	The Honourable G. A. Kennedy
Master	Mr G. T. Staples

*The District Court of Western Australia*

Chairman of Judges	His Honour Judge W. P. Pidgeon
Judges	His Honour Judge D. C. Heenan
	His Honour Judge F. Ackland
	His Honour Judge V. J. A. O'Connor
	His Honour Judge I. R. Gunning
	His Honour Judge B. T. O'Dea

*The Family Court of Western Australia*

Chairman of Judges	The Honourable A. J. Barblett
Judges	His Honour Judge I. W. P. McCall
	His Honour Judge D. F. Connor
	His Honour Judge G. E. S. Ferrier
	His Honour Judge D. R. Anderson

Particulars of these and other Western Australian courts, and Commonwealth courts appear in Chapter V, Part 6 and Chapter X, Part 1.

## STATE REPRESENTATION OVERSEAS AND IN OTHER STATES

Western Australia has been represented in the United Kingdom by an Agent General since 1892, the first appointment to the post being that of Sir Malcolm Fraser. An Office is maintained at Western Australia House, 115 Strand, London, W.C.2. Its functions include the representation of all Government Departments which have business in Britain and Europe, the purchase of government stores and equipment, the attraction of migrants, the encouragement of overseas private investment in Western Australia, and the provision of various types of assistance to visitors from Western Australia. In addition, the Office acts as agent for the State Treasury and as a receiving agency for The Rural and Industries Bank of Western Australia. Western Australia's European Public Relations Office and its tourist officer for the United Kingdom and Europe also operate from Western Australia House. The Agent General for Western Australia, Mr L. W. Slade, is the personal representative in Britain of the State Premier.

The State is also represented in Japan, an Office being maintained by the Western Australian Government at Sankaido Building, 9-13 Akasaka, 1-CHOME, Minato-Ku 107, Tokyo.

The Western Australian Department of Tourism has travel centres at Level 2, City Mutual Building, 307 Queen Street, Brisbane, 92 Pitt Street, Sydney, 2 Royal Arcade, Melbourne and 108 King William Street, Adelaide. The managers of the travel centres provide liaison on behalf of Government Departments which have business in these cities.

## OVERSEAS REPRESENTATION IN WESTERN AUSTRALIA

There are twenty-eight countries represented in Western Australia by a consular agent, vice-consul, consul, consul-general, or trade representative as follows.

Austria — R. Holmes, Honorary Consul, 21 Howard Street, Perth 6000.

Belgium — S. Drake-Brockman, C.M.G., Honorary Consul, Elder House, 111 St George's Terrace, Perth 6000.

Belgium — L. Baee, Trade Commissioner, St George's Court, 16 St George's Terrace, Perth 6000.

Britain — G. Miles, O.B.E., Consul-General, Prudential Building, 95 St George's Terrace, Perth 6000.

Canada — P. Firkins, Honorary Trade Representative, Perth Chamber of Commerce, 14 Parliament Place, West Perth 6005.

Chile — E. E. Puffe, Honorary Consul, 24 Rosser Street, Cottesloe 6011.

Denmark — J. C. Garnsworthy, Honorary Consul, 17 Phillimore Street, Fremantle 6160.

- Finland — R. C. Matisse, Honorary Consul, 47 Allerton Way, Booragoon 6154.
- France — I. H. Hunter, Honorary Consul, 21st Floor, Allendale Square, 77 St George's Terrace, Perth 6000.
- France — G. A. Roussilhes, Trade Commissioner, 231 Adelaide Terrace, Perth 6000.
- Germany, Federal Republic of — K. Kayser, Vice Consul, St George's Court, 16 St George's Terrace, Perth 6000.
- Greece — P. Avierinos, Consul, St George's Court, 16 St George's Terrace, Perth 6000.
- Guatemala — P. Smetana, Honorary Consul, 28 Warralong Crescent, Mount Lawley 6050.
- Indonesia — W. W. G. Meecham, Honorary Consul, 133 St George's Terrace, Perth 6000.
- Ireland — M. Nolan, Honorary Consul, 6 Cleaver Street, West Perth 6005.
- Italy — G. L. Mascia, Consul, 31 Labouchere Road, South Perth 6151.
- Italy — Dr F. Romano, Trade Commissioner, 256 Adelaide Terrace, Perth 6000.
- Japan — T. Aikawa, Consul-General, 8th Floor, Commonwealth Bank Building, 150 St George's Terrace, Perth 6000.
- Lesotho, United Kingdom of — R. G. Popham, Honorary Consul, 14 Allen Street, South Perth 6151.
- Malaysia — Hussin Bin Hamid, Consul, 15th Floor, Allendale Square, 77 St George's Terrace, Perth 6000.
- Netherlands — L. W. Claasen, Vice Consul, 111 St George's Terrace, Perth 6000.
- New Zealand — M. J. McLean, Consul, St George's Court, 16 St George's Terrace, Perth 6000.
- Norway — P. G. Lynn, Honorary Consul, 11 Cliff Street, Fremantle 6160.
- Philippines — G. V. Mummery, Honorary Consul-General, 451 Murray Street, Perth 6000.
- Portugal — Honorary Vice-Consul, Vacant.
- Seychelles — G. F. Robert, Honorary Consul, 271 Canning Road, Lesmurdie 6076.
- Spain — A. Quintela, Honourary Vice-Consul, 130 William Street, Perth 6000.
- Sweden — H. Morgan, Honorary Consul, Market House, 849-51 Wellington Street, Perth 6000.
- Switzerland — R. H. Abplanalp, Honorary Vice-Consul, 29 Marie Way, Kalamunda 6076.
- Thailand — Brigadier W. D. Jamieson, R.L., Honorary Consul-General, 135 Victoria Avenue, Dalkeith 6009.
- United States of America — Miss M. C. Carbone, Consul, Scottish Amicable Building, 246 St George's Terrace, Perth 6000.
- Yugoslavia — D. Jovic, Consul, 24 Colin Street, West Perth 6005.

In addition, the Grand Duchy of Luxembourg is represented in Western Australia by the Consul for Belgium. Liechtenstein is represented by the Vice-Consul for Switzerland. For Britain and the Federal Republic of Germany the respective trade representatives are part of the consular staff located at their respective embassies listed above.

#### THE LOCAL GOVERNMENT SYSTEM

The function of local government in Western Australia is performed by a number of Councils (or, in special circumstances, by Commissioners appointed by the Governor) exercising powers conferred by the Parliament of the State. Each of the Councils consists of members elected by a local community and is responsible for the provision of many of the services necessary for the organisation and welfare of the community which it represents.

As early as 1838 an Act providing a measure of local government was passed and under its provisions the management and control of the town of Perth was vested in a body of trustees. The first elected Town Trust was constituted at Perth in 1842 under an Act of 1841 for the 'Improvement of Towns in Western Australia'. The trust was dissolved in 1858 and replaced by a City Council, the town of Perth having been constituted a city when it became the seat of a Bishop in 1856.

Legislation was enacted in 1871 establishing Municipalities and Road Boards throughout the Colony. The existing Statute regulating the operations of the local authorities is the *Local Government Act 1960-1980*, which is administered through a Department of Local Government by the Minister for Local Government. This Act consolidates the law relating to local government in Western Australia, and by its provisions the Municipal Corporations Act, the Road Districts Act and a number of other, less important, Acts were repealed. The legislation came into operation on 1 July 1961 and from that date new designations were applied to many local government districts, bodies and offices. Former Municipalities, other than Cities, became known as 'Towns' and Road Districts were renamed 'Shires'. Municipalities which already had city status remained 'Cities'. The executive body in each local government district became a 'Council', City Councils and Town Councils being presided over by a Mayor, and Shire Councils by a President. The chief non-elective executive office of a City or a Town is that of 'Town Clerk' and of a Shire, that of 'Shire Clerk'.

At 31 December 1980 there were 12 Cities, 12 Towns and 114 Shires in Western Australia.

### **Local Government Districts**

The only unincorporated area in mainland Western Australia is Kings Park, a public reserve of about 403 hectares in Perth, all other land being incorporated within the district of a City, Town or Shire.

On presentation of a petition signed by a prescribed minimum number of ratepayers, the number varying with the subject matter, the Governor may by Order constitute any part of the State as a Town; constitute as a new Shire any part of an existing Shire; divide a Shire into two or more Shires; sever portion of a district and annex the portion to an adjoining district, or constitute the portion as a new Town or Shire; divide a district into wards; or abolish a district and dissolve the local governing authority. In some cases the ratepayers of a district have the right to demand that a poll be held on the question of boundary changes.

The Act establishes a Local Government Boundaries Commission of three members, one being an officer of the Department of Local Government, who is Chairman of the Commission. The other members must be persons having experience in local government and nominated by associations of local government authorities. The Minister may refer to the Commission any question concerning the constitution or alteration of the constitution of local government districts. Every case where authorities are unable to agree on a matter of amalgamation or severance of territory must be referred to the Commission.

On the petition of the local authority concerned, the Governor may by Order declare to be a City any district which satisfies certain specified requirements. These requirements are that, during the three years immediately preceding the declaration, it shall have maintained a population of not less than 30,000 persons if situated in the metropolitan area as declared for the purposes of the Act, or not less than 20,000 persons if situated outside that area; and have maintained a gross revenue of \$200,000 for each of the three years. In addition the district must be clearly distinguishable as a centre of population having a distinct civic centre with adequate halls and cultural facilities, and must have sufficient residential, commercial and industrial centres to justify its declaration as a separate city. Of the twelve Cities in Western Australia, eleven are situated in the Perth Statistical Division, with Bunbury being the first country city. There had been five cities granted city status before the requirements imposed by the present legislation became operative. These five Cities are Perth (proclaimed in 1856), Fremantle (1929), Subiaco (1952), Nedlands (1959), and South Perth (1959). Having satisfied the requirements for city status provided by the Local Government Act the Town of Melville was declared a city on 3 May 1968, the Shire of Perth was redesignated the City of Stirling with effect from 24 January 1971 and the Town of Gosnells was declared a city on 1 July 1977. In addition the following areas were declared cities in 1979: the Shire of Belmont, 17 February; the Town of Canning, 10 March; the Town of Bunbury, 8 October and the Town of Cockburn, 26 October.

The boundaries of local government districts as they existed at 30 June 1981 are delineated on the maps of the State inside the back cover and the names and designations as at that date are given in accompanying lists.

### **Constitution and Electoral Provisions**

The provisions of the Local Government Act relating to the composition of a City Council or a Town Council require that, in addition to the Mayor, there shall be, where the population is less than 1,000, six councillors; where the population is between 1,000 and 5,000, nine councillors; and if the population exceeds 5,000, twelve councillors if the district is not divided into wards but, where the district is divided into wards, three councillors for each ward. It is provided that a Shire Council shall consist of not less than five nor more than thirteen members, including the President.

Two methods of election to the office of Mayor or of President are prescribed. In the case of a City or Town, election is usually by a poll of the electors enrolled for the district. The President of a Shire is usually elected by the councillors from among their own number. It is provided, however, that a City or Town may adopt the system of election of the Mayor by the councillors, and that a Shire may conduct a poll of its electors for election to the office of President. The question of the adoption of the alternative system must, in all cases, be determined by submission to a poll of the electors, after delivery to the Mayor or the President of a resolution of a majority of the councillors or a petition signed by one-tenth of the electors, or by fifty electors, whichever is the greater. If not less than 15 per cent of eligible electors vote at the poll and a majority of the valid votes cast are in favour of the proposed alteration, the Governor shall order its adoption.

The Act constitutes the office of Deputy Mayor, in the case of a City or a Town, and of Deputy President in the case of a Shire, and requires that the Council shall elect one of the councillors to the office.

Provision is made for local government elections to be held on the fourth Saturday in May of each year but in specified circumstances the Governor may, by proclamation, appoint a Saturday in May, earlier than the fourth Saturday, to be the election date. Membership of a Council is elective in all cases, the qualified electors being adult natural-born or naturalised British subjects who own or occupy rateable land in the district. The preferential system of voting is used and representation is generally on the basis of wards into which the district may be divided. Plural voting applies, an elector being entitled, in accordance with the rateable value of the property owned or occupied by him, to a number of votes which may not, however, exceed four in elections for Mayor or President, or two in elections for councillor. Voting is not compulsory. The Act contains provisions enabling nominees of corporations owning land in a district to vote at local government elections and to be elected to membership of the Council. Subject to disqualification on certain specified grounds, all adult persons who are natural-born or naturalised British subjects owning or occupying rateable land within the district are eligible for election to the Council of the district whether as Mayor, President or councillor, provided that in the case of occupiers their names appear on the Council's electoral roll.

The term of office of a Mayor or a President is two years if elected by the electors of the district, or one year if elected by the Council. Councillors are elected for a term of three years, as near as practicable to one-third of their number retiring each year. On the expiration of their term of office all members, including the Mayor and the President, are eligible for re-election if not subject to any of the disqualifications contained in the Act.

It is provided that, if in a particular district there should at any time be no Council or insufficient councillors to form a quorum, a Commissioner may be appointed to exercise all the powers of the local authority.

### Functions of Local Authorities

The functions and powers of local authorities are extremely diverse in character. They are prescribed in detail in the Local Government Act and some of the more important of them are referred to in later Chapters of the Year Book. For example, reference to local government activity in the fields of road construction and maintenance will be found in Chapter VI, Part 1 and Chapter IX, Part 3; the provision of parks, gardens and recreation grounds in Chapter V, Part 2; libraries in Chapter V, Part 2; public transport facilities in Chapter IX, Part 3; water supplies in Chapter VII, Part 2; town planning and building control in Chapter V, Part 5; and the licensing of vehicles in Chapter IX, Part 3. Among the many other powers of local authorities are those relating to hospitals and nursing services, kindergartens, hostels for school children, community centres, dental clinics, infant and maternal health centres, day nurseries, control of dogs, jetties, swimming pools, sanitation and disposal of refuse, fire prevention, eradication of noxious weeds and vermin, electricity generation, aerodromes, abattoirs, quarries, pounds and cemeteries. Under the provisions of the Health Act local authorities are responsible for certain aspects of health administration.

The operations of any local government authority may be subject to investigation by a person appointed by the Governor or the Minister and having, for the purposes of the inquiry, the powers of a Royal Commission.

### Financial Provisions

Local government authorities have four major sources of finance. They are moneys received from rates, loans, government grants and personal income tax entitlements. Financial powers of local authorities, although derived mainly from the Local Government Act, are also provided by other Statutes, including the Health Act, the Fire Brigades Act, the Cemeteries Act, and the Library Board of Western Australia Act.

**Rates.** The general rate for a local government district in any year is determined by dividing the sum required to make up the difference between anticipated expenditure and estimated revenue from sources other than rates for that year by the total value of rateable property in the district. However, a Council may impose a rate which would yield less than the amount required to balance its budget, subject to approval by the Minister. In assessing the value of rateable property, every local authority must adopt valuations made by the Valuer-General under the provisions of the *Valuation of Land Act 1979*. The *Land Valuation Tribunals Act 1978* provides for the constitution of Land Valuation Tribunals, to which appeals may be made on matters concerning valuations of property.

Valuations may be on the basis of either 'unimproved value' or 'gross rental value'. The unimproved value generally represents the price which the rated land might be expected to realise if sold on the open market and, as the term implies, excludes any improvements. The gross rental value is an estimate of the gross rental value of the property including improvements. Generally, City Councils and Town Councils are required to assess the general rate on the basis of gross rental value, and Shire Councils on unimproved value. It is provided, however, that any Council may, under certain specified conditions, adopt the alternative basis. Although in general a Council is required to levy a rate which is uniform throughout its district, it may differentiate in rating by charging a higher rate in a specified area where expenditure, including loan interest and repayments, is incurred in providing special services for the benefit of that area. Councils may charge a penalty on unpaid rates. The prescribed maximum percentage in applying an interest penalty is 10 per cent.

**Loans.** Local authorities are authorised to raise loans for works and undertakings and for the liquidation of existing loan debts. A Council may, with the written consent of the Minister obtain advances from a bank for a budget deficiency, for the installation of sewerage connections and septic tanks, and for other work approved by the Governor. With the written permission of the Minister a Council may also borrow from a permanent building society to enable it to

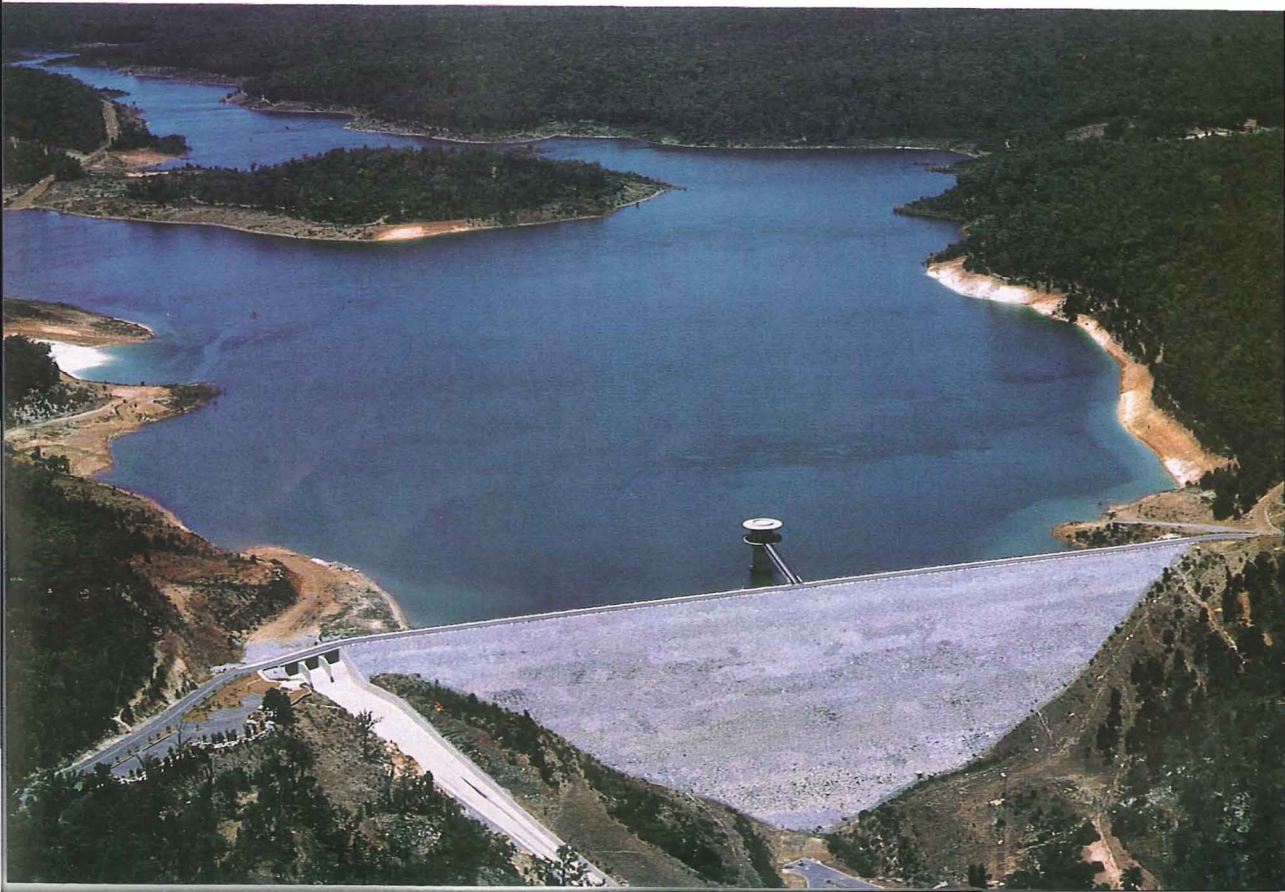




PLATE 5 — Construction of the 3.7 kilometre Wungong Tunnel outlet, utilising a laser beam to determine alignment and grade. *Metropolitan Water Board*

PLATE 6 — THE WUNGONG DAM which contributes to the Metropolitan Water Supply, has a capacity of 60 million cubic metres.

*Metropolitan Water Board*





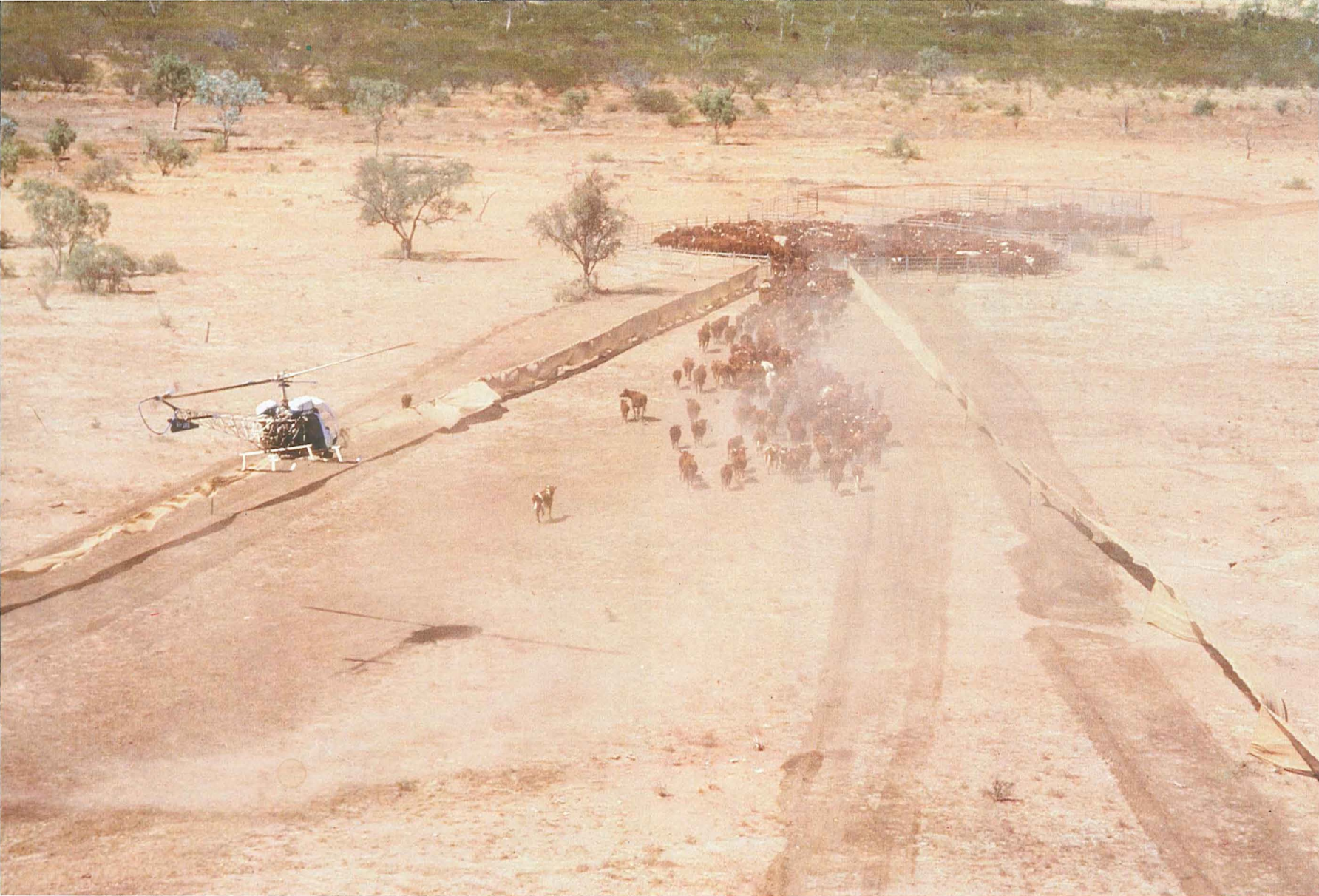


PLATE 7 — MUSTERING CATTLE BY HELICOPTER  
A modern method of mustering cattle in the Kimberley region.

acquire or develop land for the purpose of subdivision into residential lots. Money may also be borrowed by the sale of debentures, repayment being either by the system of reducible principal or by means of a sinking fund. Payments to debenture holders are made at prescribed intervals. Under the system of reducible principal, the local authority undertakes to pay both principal and interest by fixed instalments. Where redemption is by means of a sinking fund, the local authority is required to establish and maintain the necessary fund at the State Treasury. Interest on the loan is normally paid half-yearly and the full amount of the loan is repaid at maturity.

The extent of loan raisings for works and undertakings is controlled by a provision which, except with the specific approval of the Governor, imposes a limit on the borrowings of an authority. The total amount of loans for which a Council may be indebted at any one time is a sum equal to ten times the amount obtained by subtracting from the average of the ordinary revenue of the authority during the preceding two years the average, for the same period, of its annual expenditure on the servicing of loans. The legislation allows that balances standing to the credit of sinking funds for loan repayment, as well as amounts actually repaid, may be deemed to be repayments for purposes of calculating net total debt. In the case of borrowings to liquidate existing loans, it is provided that the money raised shall not exceed the outstanding balance of the loan.

Before a loan may be raised by the issue of debentures, approval of the borrowing must be obtained from the State Treasury and the local authority must then publish in a newspaper and in the *Government Gazette of Western Australia* a notification of its intention to borrow money, including a statement of the amount of the proposed loan, its purpose and other relevant matters. Except in the case of a loan to liquidate an existing loan debt, the ratepayers of the district may demand that the proposition be submitted to a poll. If less than 15 per cent of the ratepayers vote at the poll, or a majority of the votes are in favour of the loan, the raising of the loan is approved.

Certain of the works and undertakings for which loan moneys may be used are specified in the Local Government Act. They include the construction of streets, roads and bridges, sewers, drains and water works; the erection or purchase of electric lighting plant, gas works and stone quarries; the provision of hostels for school children, libraries and other recreational facilities; the construction of civic and other buildings; and the purchase of land, materials and equipment. Where a particular work or undertaking is not specified in the Act the Governor may approve of it as a project for which money may be borrowed.

**Government Grants.** Government grants constitute an important source of revenue for local government authorities. These are mainly specific purpose payments for road works, further details of which are provided in Chapter IX, Part 3 — Transport, *Finance for Roads*.

**Personal Income Tax Entitlements.** The *Local Government (Personal Income Tax Sharing) Act 1976* requires each State to allocate not less than 30 per cent of the funds among local government authorities on a population basis, but account may also be taken of the area of the authority, population density or any other matter agreed upon between the Commonwealth and the State. The remaining funds are to be allocated having regard to the special needs and disabilities of local authorities.

State legislation constituting the Western Australian Local Government Grants Commission became effective on 11 May 1978, under the authority of the *Local Government Grants Act 1978*. The Act prescribes that 80 per cent of the State's entitlement be distributed on primarily a population basis. The Minister has discretion to vary this percentage, subject to the requirement that not less than 30 per cent of the funds are distributed on that basis. The remaining 20 per cent of the funds are to be allocated upon the recommendations of the Local Government Grants Commission according to the special needs of local government authorities. The Minister is empowered to request the Commission to review its

recommendations. In such circumstances, the Commission shall re-submit its recommendations to the Minister with, or without amendment.

**General.** The financial transactions of local government authorities are subject to annual audit either by an auditor (or auditors) appointed by the Council or by a government inspector appointed by the Minister. To qualify for the office of auditor, a person must be a member of a specified institute or society of accountants and be registered as an auditor under the Companies Act. Appointment is for a term not exceeding two years, at the end of which time the holder of the office is eligible for reappointment.

The financial year for all Councils ends on 30 June.

Details of the revenue and expenditure of local authorities during the five-year period ending with the financial year 1978-79 are given in the section *Local Government Finance* in Chapter VI, Part I.

### STATISTICAL DIVISIONS

The local government districts are used as the basis of presentation of data derived not only from the population census but also from many of the regular statistical collections. Information presented in this way is valuable when considering activities in particular local government areas but is often more detailed than is required for a broader geographical assessment. For this reason, the local government districts are combined into statistical divisions which provide significant areas for the publication of statistics in a convenient summary form.

The partition of the Australian States into statistical divisions originated from a resolution of a conference of 1928 between the Federal Health Council of Australia and the Statisticians of the Commonwealth and the States concerning the need for the delineation of areas appropriate for the purposes of statistical tabulation. They first became operative in 1929 after consultation between the Australian Statistician, the Statisticians of the States in collaboration with the State health authorities, and the Commonwealth Department of Health. Although statistical divisions were devised initially for use in the compilation and presentation of vital statistics, the advantages of extending the system to other fields of statistical investigation were recognised at once and it soon came to have general application in cases where consideration of geographic areas was relevant.

### LIST OF STATISTICAL DIVISIONS

#### with component Local Government Areas at 30 June 1981

(Statistical divisions are indicated thus: *SOUTH-WEST*: sub-divisions thus: *BLACKWOOD*: local government areas thus: Manjimup. Cities are marked (C) and Towns (T), all other government areas being Shires.)

#### PERTH

##### CENTRAL METROPOLITAN

Claremont (T)  
Cottesloe (T)  
Mosman Park (T)  
Nedlands (C)  
Peppermint Grove  
Perth (C)  
Subiaco (C)

##### EAST METROPOLITAN

Bassendean (T)  
Bayswater  
Kalamunda  
Mundaring  
Swan

##### NORTH METROPOLITAN

Stirling (C)  
Wanneroo

##### SOUTH-WEST METROPOLITAN

Cockburn (C)  
East Fremantle (T)  
Fremantle (C)  
Kwinana (T)  
Melville (C)  
Rockingham

##### SOUTH-EAST METROPOLITAN

Armadale (T)  
Belmont (C)  
Canning (C)  
Gosnells (C)  
Serpentine-Jarrahdale  
South Perth (C)

#### SOUTH-WEST

##### MURRAY

Mandurah  
Murray  
Waroon

##### PRESTON

Bunbury (C)  
Capel  
Collie  
Dardanup  
Donnybrook-Balingup  
Harvey

##### VASSE

Augusta-Margaret River  
Busselton

##### BLACKWOOD

Boypur Brook  
Bridgetown-Greenbushes  
Manjimup  
Nannup

## LIST OF STATISTICAL DIVISIONS

with component Local Government Areas at 30 June 1981 — continued

(Statistical divisions are indicated thus: *SOUTH-WEST*; sub-divisions thus: *BLACKWOOD*; local government areas thus: Manjimup. Cities are marked (C) and Towns (T), all other government areas being Shires.)

<b>LOWER GREAT SOUTHERN</b>		<b>MIDLANDS — continued</b>		<b>CENTRAL — continued</b>	
<b>PALLINUP</b>		<b>AVON</b>		<b>CARNEGIE</b>	
Broomehill		Beverley		Cue	
Gnowangerup		Cunderdin		Meekatharra	
Katanning		Dalwallinu		Mount Magnet	
Kent		Dowerin		Murchison	
Kojonup		Goomalling		Sandstone	
Tambellup		Koorda		Wiluna	
Woodanilling		Northam (T)		Yalgoo	
<b>KING</b>		Northam		<b>GREENOUGH</b>	
Albany (T)		Quairading		Carnamah	
Albany		Tammin		Chapman Valley	
Cranbrook		Toodyay		Coorow	
Denmark		Wongan-Ballidu		Geraldton (T)	
Plantagenet		Wyalkatchem		Greenough	
<b>UPPER GREAT SOUTHERN</b>		<b>YORK</b>		Irwin	
<b>WILLIAMS</b>		<b>CAMPION</b>		Mingenew	
Boddington		Bruce Rock		Morawa	
Brookton		Kellerberrin		Mullewa	
Cuballing		Merredin		Northampton	
Dumbleyung		Mount Marshall		Perenjori	
Narrogin (T)		Mukinbudin		Three Springs	
Narrogin		Narembeen		<b>PILBARA</b>	
Pingelly		Nungarin		<b>DE GREY</b>	
Wagin		Trayning		East Pilbara	
Wandering		Westonia		Port Hedland	
West Arthur		Yilgarn		<b>ASHBURTON</b>	
Wickepin		<b>SOUTH-EASTERN</b>		Roeburne	
Williams		<b>LEFROY</b>		West Pilbara	
<b>LAKES</b>		Boulder		<b>KIMBERLEY</b>	
Corrigin		Coolgardie		<b>ORD</b>	
Kondinin		Kalgoorlie (T)		Halls Creek	
Kulin		Laverton		Wyndham-East Kimberley	
Lake Grace		Leonora		<b>FITZROY</b>	
<b>MIDLANDS</b>		Menzies		Broome	
<b>MOORE</b>		<b>DUNDAS</b>		West Kimberley	
Chittering		Dundas			
Dandaragan		Esperance			
Gingin		Ravensthorpe			
Moora		<b>CENTRAL</b>			
Victoria Plains		<b>GASCOYNE</b>			
		Carnarvon			
		Exmouth			
		Shark Bay			
		Upper Gascoyne			

## LIST OF LOCAL GOVERNMENT AREAS

at 30 June 1981

Local government area	City (C) Town (T) Shire (S)	Statistical division in which situated	Local government area	City (C) Town (T) Shire (S)	Statistical division in which situated
ALBANY	T.	Lower Great Southern	Boyup Brook	S.	South-West
Albany	S.	Lower Great Southern	Bridgetown-Greenbushes	S.	South-West
Armadale	T.	Perth	Brookton	S.	Upper Great Southern
Augusta-Margaret River	S.	South-West	Broome	S.	Kimberley
BASSENDEAN	T.	Perth	Broomehill	S.	Lower Great Southern
Bayswater	S.	Perth	Bruce Rock	S.	Midlands
Belmont	C.	Perth	BUNBURY	C.	South-West
Beverley	S.	Midlands	Busselton	S.	South-West
Boddington	S.	Upper Great Southern	CANNING	C.	Perth
Boulder	S.	South-Eastern	Capel	S.	South-West

**LIST OF LOCAL GOVERNMENT AREAS**  
**at 30 June 1981 — continued**

Local government area	City (C) Town (T) Shire (S)	Statistical division in which situated	Local government area	City (C) Town (T) Shire (S)	Statistical division in which situated
Carnamah	S.	Central	Mount Marshall	S.	Midlands
Carnarvon	S.	Central	Mukinbudin	S.	Midlands
Chapman Valley	S.	Central	Mullewa	S.	Central
Chittering	S.	Midlands	Mundaring	S.	Perth
CLAREMONT	T.	Perth	Murchison	S.	Central
COCKBURN	C.	Perth	Murray	S.	South-West
Collie	S.	South-West			
Coolgardie	S.	South-Eastern	Nannup	S.	South-West
Coorow	S.	Central	Narembeen	S.	Midlands
Corrigin	S.	Upper Great Southern	NARROGIN	T.	Upper Great Southern
COTTESLOE	T.	Perth	Narrogin	S.	Upper Great Southern
Cranbrook	S.	Lower Great Southern	NEDLANDS	C.	Perth
Cuballing	S.	Upper Great Southern	NORTHAM	T.	Midlands
Cue	S.	Central	Northam	S.	Midlands
Cunderdin	S.	Midlands	Northampton	S.	Central
			Nungarin	S.	Midlands
Dalwallinu	S.	Midlands			
Dandaragan	S.	Midlands	Peppermint Grove	S.	Perth
Dardanup	S.	South-West	Perenjori	S.	Central
Denmark	S.	Lower Great Southern	PERTH	C.	Perth
Donnybrook-Balingup	S.	South-West	Pingelly	S.	Upper Great Southern
Dowerin	S.	Midlands	Plantagenet	S.	Lower Great Southern
Dumbleyung	S.	Upper Great Southern	Port Hedland	S.	Pilbara
Dundas	S.	South-Eastern			
			Quairading	S.	Midlands
EAST FREMANTLE	T.	Perth			
East Pilbara	S.	Pilbara	Ravensthorpe	S.	South-Eastern
Esperance	S.	South-Eastern	Rockingham	S.	Perth
Exmouth	S.	Central	Roebourne	S.	Pilbara
FREMANTLE	C.	Perth	Sandstone	S.	Central
			Serpentine-Jarrahdale	S.	Perth
GERALDTON	T.	Central	Shark Bay	S.	Central
Gingin	S.	Midlands	SOUTH PERTH	C.	Perth
Gnowangerup	S.	Lower Great Southern	STIRLING	C.	Perth
Goomalling	S.	Midlands	SUBIACO	C.	Perth
GOSNELLS	C.	Perth	Swan	S.	Perth
Greenough	S.	Central			
Halls Creek	S.	Kimberley	Tambellup	S.	Lower Great Southern
Harvey	S.	South-West	Tammin	S.	Midlands
			Three Springs	S.	Central
Irwin	S.	Central	Toodyay	S.	Midlands
			Trayning	S.	Midlands
Kalamunda	S.	Perth			
KALGOORLIE	T.	South-Eastern	Upper Gascoyne	S.	Central
Katanning	S.	Lower Great Southern			
Kellerberrin	S.	Midlands	Victoria Plains	S.	Midlands
Kent	S.	Lower Great Southern			
Kojonup	S.	Lower Great Southern	Wagin	S.	Upper Great Southern
Kondinin	S.	Upper Great Southern	Wandering	S.	Upper Great Southern
Koorda	S.	Midlands	Wanneroo	S.	Perth
Kulin	S.	Upper Great Southern	Waroona	S.	South-West
KWINANA	T.	Perth	West Arthur	S.	Upper Great Southern
			West Kimberley	S.	Kimberley
Lake Grace	S.	Upper Great Southern	West Pilbara	S.	Pilbara
Laverton	S.	South-Eastern	Westonia	S.	Midlands
Leonora	S.	South-Eastern	Wickepin	S.	Upper Great Southern
Mandurah	S.	South-West	Williams	S.	Upper Great Southern
Manjimup	S.	South-West	Wiluna	S.	Central
Meekatharra	S.	Central	Wongan-Ballidu	S.	Midlands
MELVILLE	C.	Perth	Woodanilling	S.	Lower Great Southern
Menzies	S.	South-Eastern	Wyalkatchem	S.	Midlands
Merredin	S.	Midlands	Wyndham-East	S.	Kimberley
Mingenew	S.	Central	Kimberley		
Moora	S.	Midlands			
Morawa	S.	Central	Yalgoo	S.	Central
MOSMAN PARK	T.	Perth	Yilgarn	S.	Midlands
Mount Magnet	S.	Central	York	S.	Midlands



## CHAPTER IV — POPULATION AND VITAL STATISTICS

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## CHAPTER IV — POPULATION AND VITAL STATISTICS

### Part 1 — Population

The State of Western Australia, although comprising almost one-third of the total area of Australia, contains only about one-twelfth of the population.

At the end of 1829, the year of establishment of the Colony, there were 1,000 persons in Western Australia. Progress in the early years was slow, and in 1849 the population was still less than 5,000. Transportation of convicts, begun in the following year, resulted in some acceleration, but it was not until the discovery of gold in the Kimberley in 1885 and the rich finds at Coolgardie in 1892 and at Kalgoorlie in 1893 that any marked increase took place. This development was so rapid that, in the last decade of the century, the population was almost quadrupled, from 48,500 at the end of 1890 to 180,000 in 1900, representing an average annual rate of increase of 14.01 per cent. The rate of growth in those years has never been approached in the present century, but the average annual rate of increase of Western Australia's population from the Census of 1901 to March 1980, 2.46 per cent, has been higher than that of any other State and of Australia as a whole (1.72 per cent).

#### THE CENSUS

The first systematic census of the Colony of Western Australia was taken in 1848, since when there have been fifteen enumerations, at the dates shown in the first table in this Part. The Census of 1881 was the first taken simultaneously in all the Australian Colonies and formed part of the first simultaneous census of the British Empire.

The first census of the Commonwealth of Australia conducted under the authority of the *Census and Statistics Act* 1905 was taken in 1911. The Act provided that a census should be taken in that year 'and in every tenth year thereafter'. In 1930 this provision was amended by the addition of the words 'or at such other time as is prescribed'. The depressed economic conditions of 1931 caused the postponement of the third Australian census to 1933, and because of war conditions the fourth Australian census was not taken until 1947. Consideration was then given to holding future censuses in the series of years originally provided for by the Act. However, it was thought that the interval from 1947 to 1951 was too short, and it was therefore decided to take the fifth census in 1954, at the mid-point of the period from 1947 to 1961. The sixth census was held in 1961. Since 1961 censuses have been conducted at five-yearly intervals.

#### Scope of the Census

The Australian census is conducted on a *de facto* basis, i.e. it records the population actually in Australia, persons being enumerated at the place where they spent the night of the census, and the population so recorded being credited to that place whether or not it is the usual place of residence.

The census covers the population of Australia and the dwellings in which it lives. The only persons excluded from the census tabulations are diplomatic representatives of overseas countries and their families and staffs having diplomatic immunity in accordance with international practice. Prior to the Census of 30 June 1971 full-blood Australian Aborigines were also excluded (see the following section *Aborigines*).

The term 'dwelling', as defined in the *Census and Statistics Act*, means 'a building, erection, or tenement, whether permanent or temporary, which is wholly or partly used for the purpose of



human habitation and includes any ship or other vessel in any port of the Commonwealth or in any inland waters thereof, or any ship or vessel on a passage between any two Commonwealth ports'.

**Aborigines.** Before an amendment to the Commonwealth Constitution in 1967, it was provided by section 127 that 'in reckoning the numbers of the people of the Commonwealth, or of a State or other part of the Commonwealth, aboriginal natives shall not be counted'. This provision was deleted following a referendum held on 27 May 1967 which resulted in a large majority of votes in favour of its repeal. The enabling Act, the *Constitution Alteration (Aborigines)* 1967, came into operation on 10 August 1967.

With regard to the original provision, Commonwealth legal authorities were of the opinion that persons of the half-blood were not 'aboriginal natives' within the meaning of the Constitution, and *a fortiori* that persons of less than half Aboriginal blood were not Aboriginal natives. Accordingly, only persons having Aboriginal blood to a degree greater than one-half were excluded from the census tabulations. Dwellings occupied solely by full-blood Aborigines so defined were similarly excluded.

#### **Under-enumeration**

Post-enumeration surveys, which are designed to measure the degree of error in a census, were conducted after both the 1971 and 1976 Censuses, by specially trained interviewers. Net under-enumeration was derived by comparing results from the Census and the post-enumeration survey for the same individuals, and identifying omissions and duplications in the Census.

While every effort is made to minimise under-enumeration in the Census, some inevitably remains for various reasons (e.g. inadvertent omission of very young children, treatment by the collector of an occupied dwelling as unoccupied). Refusal by householders to complete the Census Schedule is not considered to be a significant cause of under-enumeration, as estimates by the collector are used in such cases. These and similar problems are common to all population censuses, and although under-enumeration has increased in Australia since the 1971 Census, it is of a similar order to that experienced by comparable countries. For example, the percentage adjustment for under-enumeration at the 1970 Census of the United States, was measured at 2.5 per cent.

The 1976 post-enumeration survey was based on a sample size of  $\frac{2}{3}$  per cent of households, compared with  $\frac{1}{4}$  per cent for 1971. The sample size was increased to provide more reliable data on the characteristics (e.g. sex, age) of omitted persons.

Persons living in non-private dwellings (e.g. hotels, motels, hospitals) and sparsely settled areas were excluded from both the 1971 and 1976 post-enumeration surveys because of operational difficulties in conducting follow-up interviews. However, these amount only to about 5 per cent of the population and hence any under-enumeration of them is unlikely to have a significant effect on the total level of under-enumeration.

Adjustments have been made to the Australian and State totals for numbers of males and females at the 1971 Census as well as to total population for capital city divisions. In addition, for the 1976 Census, adjustments have been made to the numbers at each age at the Australian and State levels and to total population at the local government area level.

#### **The 1976 Census**

Processing of the 1976 Census data was divided into two stages. The first stage, completed in October 1976, involved processing details relating to age, sex, marital status, birthplace, and occupied and unoccupied dwellings. The second stage, involving processing of all other characteristics, was completed in October 1978. Because the second stage involved sample processing, the final results of the census are subject to sampling error and components of tables may not add to totals. Further information on sampling errors is contained in the publication *Sampling Errors Associated With Census Estimates* (Catalogue No. 2129.0) issued by the Australian Statistician, Canberra.

### Population at each Census

The population recorded in Western Australia at each census from 1848, its relation to the Australian population, and the masculinity are shown in the following table.

The masculinity of the Australian population at the three latest censuses was 101.17 in 1966, 100.62 in 1971 and 100.52 in 1976.

POPULATION AT EACH CENSUS DATE — 1848-1976 (a)  
WESTERN AUSTRALIA AND AUSTRALIA

Date of census	Western Australia			Western Australia		
	Males	Females	Persons	Australia Persons (b)	Proportion of Australia (per cent)	Masculinity (c)
1848 — 10 October	2,818	1,804	4,622	326,500	1.42	156.21
1854 — 30 September	7,779	3,964	11,743	671,500	1.75	196.24
1859 — 31 December	9,522	5,315	14,837	1,097,000	1.35	179.15
1870 — 31 March	15,375	9,410	24,785	1,606,000	1.54	163.39
1881 — 3 April	17,062	12,646	29,708	2,250,194	1.32	134.92
1891 — 5 April	29,807	19,975	49,782	3,177,823	1.57	149.22
1901 — 31 March	112,875	71,249	184,124	3,773,801	4.88	158.42
1911 — 3 April	161,565	120,549	282,114	4,455,005	6.33	134.02
1921 — 4 April	177,278	155,454	332,732	5,435,734	6.12	114.04
1933 — 30 June	233,937	204,915	438,852	6,629,839	6.62	114.16
1947 — 30 June	258,076	244,404	502,480	7,579,358	6.63	105.59
1954 — 30 June	330,358	309,413	639,771	8,986,530	7.12	106.77
1961 — 30 June	375,452	361,177	736,629	10,508,186	7.01	103.95
1966 — 30 June	432,569	415,531	848,100	11,599,498	7.31	104.10
1971 — 30 June (d)	534,100	509,000	1,043,100	12,937,200	8.06	104.92
1976 — 30 June (d)	596,800	573,100	1,169,800	13,915,500	8.41	104.14

(a) Figures for 30 June 1961 and earlier exclude full-blood Aborigines; those for 1966 and later refer to total population (i.e. including Aborigines). (b) Figures for dates prior to 3 April 1881 are estimates. (c) Number of males to each 100 females. (d) Census figures adjusted to take account of under-enumeration.

### Characteristics of the Population

**Age.** The following table shows the numbers and proportions of the population of Western Australia in selected age groups at each census from 1954 to 1976. The age groups have been chosen as representing, in a general sense, such sectors as the pre-school population, children of school age, minors, the economically active population, and those beyond normal working age.

POPULATION IN SELECTED AGE GROUPS (a) — CENSUSES, 1954 TO 1976  
(PERSONS)

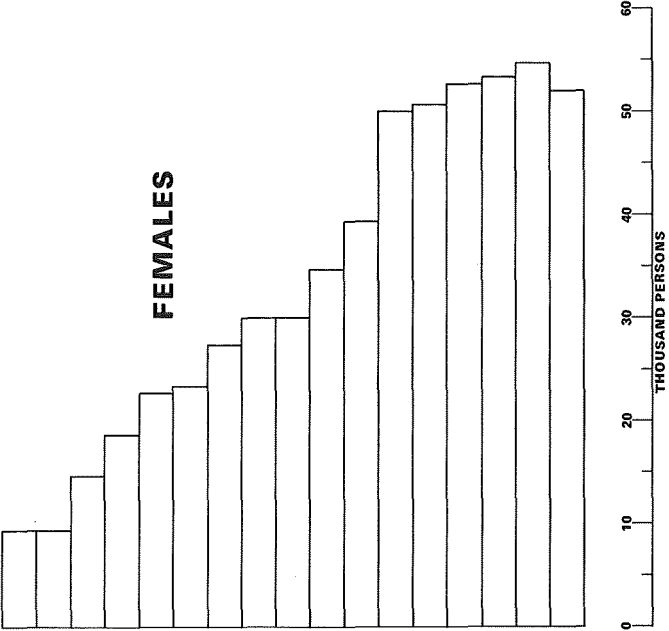
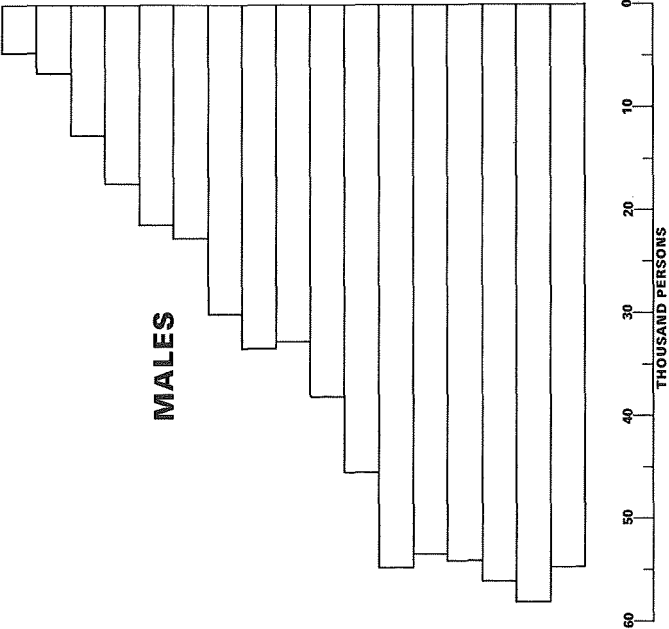
Age last birthday (years)	Number in each age group					Per cent of total				
	Census, 30 June —					Census, 30 June —				
	1954	1961	1966	1971 (b)	1976 (b)	1954	1961	1966	1971 (b)	1976 (b)
Under 6	89,221	98,447	104,984	126,200	130,800	13.95	13.36	12.38	12.10	11.18
6 — 12	85,972	110,438	125,498	145,500	153,000	13.44	14.99	14.80	13.95	13.08
13 — 15	115,238	153,294	176,627	207,000	220,400	18.01	20.81	20.83	19.84	18.84
Under 18	222,989	276,182	313,316	373,000	393,900	34.85	37.49	36.94	35.76	33.67
Under 21	247,998	307,473	356,913	432,300	457,200	38.76	41.74	42.08	41.45	39.08
15 — 44	273,948	293,882	353,971	466,100	536,600	42.82	39.90	41.74	44.69	45.87
15 — 64	397,732	441,821	518,202	653,200	747,500	62.17	59.98	61.10	62.62	63.90
65 and over	47,289	55,097	65,129	77,300	93,500	7.39	7.48	7.68	7.41	7.99
All ages	639,771	736,629	848,100	1,043,100	1,169,800	100.00	100.00	100.00	100.00	100.00

(a) Figures for 30 June 1961 and earlier exclude full-blood Aborigines; those for 1966 to 1976 refer to total population (i.e. including Aborigines). (b) Census figures adjusted to take account of under-enumeration.

**Birthplace; Religion.** The birthplace and religion of the population as recorded at the Censuses of 1971 and 1976 are shown in the following table. The Census and Statistics Act provides that there shall be no penalty for failure to answer the question on religion, and a statement to this effect is contained in the census schedule.

Population, by Age Group: Census, 30 June 1976

AGE GROUP  
(years)



### BIRTHPLACE AND RELIGION OF THE POPULATION (a) CENSUSES 1971 AND 1976

Particulars	Census, 30 June 1971				Census, 30 June 1976			
	Males	Females	Persons	Per cent of total	Males	Females	Persons	Per cent of total
<b>BIRTHPLACE</b>								
Australia	'000 375.9	'000 371.3	'000 747.2	72.51	'000 417.1	'000 415.3	'000 832.4	72.71
Europe —								
United Kingdom and Eire	82.2	74.8	157.0	15.24	90.8	85.8	176.6	15.43
Other	47.2	36.0	83.3	8.08	45.0	37.0	81.9	7.15
Total, Europe	129.4	110.8	240.3	23.32	135.8	122.8	258.6	22.58
Asia	11.8	9.8	21.6	2.10	15.1	14.2	29.3	2.56
Other countries	12.0	9.5	21.4	2.08	13.2	11.3	24.6	2.15
<b>GRAND TOTAL</b>	<b>529.1</b>	<b>501.4</b>	<b>1,030.5</b>	<b>100.00</b>	<b>581.2</b>	<b>563.7</b>	<b>1,144.9</b>	<b>100.00</b>
<b>RELIGION</b>								
Christian —	'000	'000	'000		'000	'000	'000	
Baptist	6.3	7.0	13.3	1.29	7.1	7.3	14.4	1.26
Catholic, Roman Catholic	135.8	132.2	268.0	26.00	141.5	141.8	283.2	24.74
Church of England	180.7	182.1	362.8	35.21	177.4	182.9	360.3	31.47
Lutheran	3.6	3.4	7.0	0.68	3.5	3.6	7.1	0.62
Methodist	41.1	44.2	85.3	8.28	36.9	40.1	77.0	6.73
Presbyterian	23.9	24.5	48.4	4.70	20.9	21.8	42.6	3.72
Other	41.6	43.6	85.1	8.26	43.6	46.9	90.4	7.90
Total, Christian	433.0	436.9	869.9	84.42	430.9	444.3	875.2	76.44
Non-Christian —								
Hebrew	1.6	1.5	3.1	0.30	1.5	1.4	2.9	0.25
Muslim	0.7	0.3	1.0	0.10	1.1	0.8	1.9	0.17
Other	1.1	0.6	1.7	0.16	1.8	1.4	3.3	0.29
Total, Non-Christian	3.4	2.5	5.9	0.57	4.5	3.6	8.1	0.71
Non-classifiable	1.8	1.2	3.0	0.29	3.0	2.4	5.5	0.48
No religious denomination	54.9	35.5	90.4	8.77	69.1	50.4	119.5	10.44
Not stated	36.0	25.3	61.4	5.96	73.6	63.0	136.6	11.93
<b>GRAND TOTAL</b>	<b>529.1</b>	<b>501.4</b>	<b>1,030.5</b>	<b>100.00</b>	<b>581.2</b>	<b>563.7</b>	<b>1,144.9</b>	<b>100.00</b>

(a) Figures as recorded.

### INTERCENSAL INCREASES

The following table shows the population of Western Australia at each census from 1891 to 1976, and the intercensal gains or losses by natural increase and by migration. It also shows the average annual gains or losses in each intercensal period.

#### POPULATION — ANALYSIS OF INTERCENSAL INCREASES, 1891-1976 (<sup>'000</sup>)

Period (a)	Population at beginning of period	Natural increase (b)		Net migration (c)		Total increase		Population at end of period
		Total	Annual average	Total	Annual average	Number	Annual average	
1891 — 1901 (10 years)	49.8	15.9	1.6	118.4	11.8	134.3	13.4	184.1
1901 — 1911 (10 years)	184.1	44.2	4.4	53.7	5.4	98.0	9.8	282.1
1911 — 1921 (10 years)	282.1	51.8	5.2	-1.2	-0.1	50.6	5.1	332.7
1921 — 1933 (12½ years)	332.7	60.1	4.9	46.0	3.8	106.1	8.7	438.9
1933 — 1947 (14 years)	438.9	69.4	5.0	-5.8	-0.4	63.6	4.5	502.5
1947 — 1954 (7 years)	502.5	65.6	9.4	71.7	10.2	137.3	19.6	639.8
1954 — 1961 (7 years)	639.8	79.4	11.3	17.4	2.5	96.9	13.8	736.6
1961 — 1966 (5 years)	736.6	53.1	10.6	46.9	9.4	100.0	20.0	836.7
1966 — 1971 (5 years) (d)	848.1	64.5	12.9	117.9	23.6	182.4	36.5	1,030.5
1971 — 1976 (5 years) (d) (e)	1,043.1	66.7	13.3	57.5	11.5	(f) 126.7	25.3	1,169.8

(a) For census dates, see first table in this Part. (b) Excess of births registered over deaths registered. (c) Interstate and overseas. Minus sign (—) indicates loss by migration. (d) Figures relate to total population (i.e. including Aborigines); those shown for earlier periods exclude full-blood Aborigines. (e) Census figures adjusted to take account of under-enumeration. (f) Includes an adjustment to balance net migration and recorded births and deaths with the June 1976 estimates of population aged 0 — 4 years.

## GEOGRAPHICAL DISTRIBUTION

**Urban, Rural and Migratory Population**

At the 1971 and 1976 Censuses a boundary was defined for each population cluster of 1,000 or more persons. These clusters are named 'urban centres' and the population enumerated in them is classified as urban for statistical purposes.

In determining the boundary of an urban centre with a population of 25,000 or more, all contiguous census collectors' districts which were found to have a minimum population density of approximately 200 persons per square kilometre at the census were included. Some areas of lower density were classified as urban in accordance with certain other specified criteria. The term *Major urban* is applied to those centres which had a population of 100,000 or more, and supersedes the term *Metropolitan* as used at previous censuses. Urban Perth is the only such centre in Western Australia.

Around each urban centre with a population of at least 100,000 a further boundary was defined to contain the anticipated development of the urban centre and associated smaller urban centres for a period of at least twenty years. This boundary delimits an area which is now, or is expected to be, in close social and economic contact with the urban centre. It is a fixed boundary, as distinct from the boundary of the urban centre which moves from census to census as urbanisation proceeds. In Western Australia, the area within this fixed boundary is described as the Perth Statistical Division (see maps inside back cover).

Urban Perth at 30 June 1976 comprised the Cities of Fremantle, Nedlands, Perth, South Perth and Subiaco; the Towns of Bassendean, Claremont, Cottesloe, East Fremantle and Mosman Park; the Shires of Bayswater, Belmont and Peppermint Grove; parts of the Cities of Melville and Stirling, parts of the Towns of Canning, Cockburn and Gosnells, and parts of the Shires of Armadale-Kelmscott, Kalamunda, Mundaring, Swan and Wanneroo.

In delimiting urban centres with a population of less than 25,000 persons all continuous urban growth is included (which, in small urban centres, would not necessarily occur if the density criterion were applied), together with any close but non-contiguous development which could be clearly regarded as part of the centre.

*Rural* population represents persons enumerated in the area not included in urban centres. The term *Migratory* refers to persons (both passengers and crew) who, at midnight on census night, were enumerated on board ships in Western Australian ports, or ships which had left an Australian port before census night for a next port of call in Western Australia. It includes also those who were enumerated on long-distance trains, motor coaches or aircraft.

**URBAN AND RURAL POPULATIONS (a) (b) — STATES AND TERRITORIES  
CENSUSES, 1971 AND 1976**

State or Territory	Census, 30 June 1971				Census, 30 June 1976			
	Urban	Rural	Migratory	Total population	Urban	Rural	Migratory	Total population
New South Wales	4,074,627	520,594	5,959	4,601,180	4,239,012	531,657	6,434	4,777,103
Victoria	3,072,044	428,004	2,303	3,502,351	3,203,666	441,610	1,705	3,646,981
Queensland	1,450,008	373,392	3,665	1,827,065	1,634,034	400,905	2,258	2,037,197
South Australia	992,689	179,128	1,890	1,173,707	1,056,956	186,433	1,367	1,244,756
Western Australia	840,340	187,512	2,617	1,030,469	956,077	186,115	2,665	1,144,857
Tasmania	289,580	100,418	415	390,413	301,923	100,368	575	402,866
Northern Territory	55,411	30,605	374	86,390	64,439	32,083	568	97,090
Australian Capital Territory	140,864	3,199	—	144,063	194,517	3,105	—	197,622
<b>AUSTRALIA</b>	<b>10,915,563</b>	<b>1,822,852</b>	<b>17,223</b>	<b>12,755,638</b>	<b>11,650,624</b>	<b>1,882,276</b>	<b>15,572</b>	<b>13,548,472</b>

(a) See text preceding table for definitions of *Urban*, *Rural*, etc. (b) Figures as recorded at the Census.

**Population of Urban Centres and Bounded Localities**

Those urban centres and bounded localities which had a population of more than 200 persons at the 1976 Census are included in the following table.

**POPULATION — URBAN CENTRES AND BOUNDED LOCALITIES  
CENSUSES, 1971 AND 1976**

Urban centre (U) or bounded locality	Population (a)				Intercensal increase or decrease	
	Census, 30 June —					
	1971	1976				
	Persons	Males	Females	Persons	Number	Per cent
Albany (U)	13,101	6,745	6,951	13,696	595	4.54
Augusta	350	229	235	464	114	32.57
Australind	430	415	417	832	402	93.49
Beverley	785	375	380	755	—30	—3.82
Boddington	351	180	175	355	4	1.14
Boyanup	303	142	141	283	—20	—6.60
Boyup Brook	688	311	300	611	—77	—11.19
Bridgetown (U)	1,536	652	664	1,316	—220	—14.32
Brookton	659	331	273	604	—55	—8.35
Broome (U)	2,049	1,583	1,337	2,920	871	42.51
Bruce Rock	729	318	285	603	—126	—17.28
Brunswick Junction	902	483	410	893	—9	—1.00
Bunbury (U)	17,815	9,686	9,827	19,513	1,698	9.53
Busselton (U)	4,983	2,749	2,801	5,550	567	11.38
Byford	627	404	418	822	195	31.10
Capel	657	340	329	669	12	1.83
Carnamah	466	251	198	449	—17	—3.65
Carnarvon (U)	4,242	2,713	2,628	5,341	1,099	25.91
Chidlow	204	121	127	248	44	21.57
Collie (U)	6,734	3,456	3,315	6,771	37	0.55
Coolgardie	624	327	316	643	19	3.04
Coorow	215	105	104	209	—6	—2.79
Corrigin	784	446	407	853	69	8.80
Cranbrook	392	202	173	375	—17	—4.34
Cue	287	125	133	258	—29	—10.10
Cunderdin	873	390	366	756	—117	—13.40
Dalwallinu	724	363	320	683	—41	—5.66
Dampier (U)	3,585	1,822	905	2,727	—858	—23.93
Darkan	256	132	134	266	10	3.91
Deanmill	324	155	126	281	—43	—13.27
Denham	323	205	141	346	23	7.12
Denmark	658	387	399	786	128	19.45
Derby (U)	2,538	1,212	1,199	2,411	—127	—5.00
Dongara	331	169	155	324	—7	—2.11
Donnybrook	998	503	505	1,008	10	1.00
Dowerin	351	212	209	421	70	19.94
Dumbleyung	376	139	124	263	—113	—30.05
Dunsborough	n.a.	135	159	294	..	..
Dwellingup	485	258	192	450	—35	—7.22
Eaton	785	722	701	1,423	638	81.27
Esperance (U)	4,874	2,694	2,568	5,262	388	7.96
Exmouth (U)	2,670	1,199	1,137	2,336	—334	—12.51
Geraldton (U)	15,457	9,622	9,151	18,773	3,316	21.45
Gingin	344	169	163	332	—12	—3.49
Gnowangerup (U)	1,009	468	424	892	—117	—11.60
Goldsworthy (U)	1,020	616	373	989	—31	—3.04
Goomalling	757	307	337	644	—113	—14.93
Greenbushes	275	118	114	232	—43	—15.64
Halls Creek	678	373	394	767	89	13.13
Harvey (U)	2,337	1,231	1,187	2,418	81	3.47
Jarrahdale	391	190	166	356	—35	—8.95
Jerramungup	n.a.	116	109	225	..	..
Jurien	n.a.	330	275	605	..	..
Kalbarri	n.a.	365	330	695	..	..
Kalgoorlie-Boulder (U)	20,865	9,896	9,145	19,041	—1,824	—8.74
Kambalda (U)	4,224	2,646	2,138	4,784	560	13.26
Karratha (U)	1,838	2,280	1,963	4,243	2,405	130.85
Katanning (U)	3,670	2,108	2,054	4,162	492	13.41
Kellerberrin (U)	1,306	592	606	1,198	—108	—8.27
Kojonup	983	472	472	944	—39	—3.97
Kondinin	311	198	170	368	57	18.33
Koolyanobbing	306	169	127	296	—10	—3.27
Koorda	411	222	197	419	8	1.95
Kulin	309	190	167	357	48	15.53
Kununurra (U)	1,240	822	718	1,540	300	24.19
Kwinana New Town (U)	10,108	5,538	5,443	10,981	873	8.64
Lake Grace	557	340	276	616	59	10.59
Lancelin	210	143	104	247	37	17.62

**POPULATION — URBAN CENTRES AND BOUNDED LOCALITIES**  
**CENSUSES, 1971 AND 1976 — *continued***

Urban centre (U) or bounded locality	Population (a)				Intercensal increase or decrease	
	Census, 30 June —					
	1971		1976			
	Persons	Males	Females	Persons	Number	Per cent
Laverton	n.a.	443	405	848	..	..
Leonora	594	259	209	468	—126	—21.21
Mandurah (U)	5,062	3,523	3,527	7,050	1,988	39.27
Manjimup (U)	3,526	1,905	1,829	3,734	208	5.90
Marble Bar	394	136	126	262	—132	—33.50
Margaret River	665	347	354	701	36	5.41
Meekatharra	927	410	419	829	—98	—10.57
Merredin (U)	3,553	1,938	1,723	3,661	108	3.04
Mingenew	504	231	192	423	—81	—16.07
Moora (U)	1,409	774	771	1,545	136	9.65
Morawa	887	414	400	814	—73	—8.23
Mount Barker (U)	1,595	797	765	1,562	—33	—2.07
Mount Helena	n.a.	127	134	261	..	..
Mount Magnet	636	200	162	362	—274	—43.08
Mukinbudin	321	217	175	392	71	22.12
Mullewa	878	503	430	933	55	6.26
Mundaring	630	351	326	677	47	7.46
Mundijong	236	153	146	299	63	26.69
Nannup	513	257	230	487	—26	—5.07
Narembeen	442	260	246	506	64	14.48
Narrogin (U)	4,849	2,439	2,373	4,812	—37	—0.76
Newman (U)	3,906	2,768	1,904	4,672	766	19.61
Norseman (U)	1,789	1,100	929	2,029	240	13.42
North Pinjarra	n.a.	537	469	1,006	..	..
Northam (U)	7,167	3,483	3,383	6,866	—301	—4.20
Northampton	763	353	350	703	—60	—7.86
Northcliffe	224	109	99	208	—16	—7.14
Ongerup	n.a.	127	99	226	..	..
Onslow	349	124	96	220	—129	—36.96
Paraburdoo (U)	2,977	1,436	966	2,402	—575	—19.31
Peelhurst-Singleton	n.a.	166	166	332	..	..
Pemberton	815	415	362	777	—38	—4.66
Perenjori	290	164	141	305	15	5.17
Perth (U)	641,800	360,307	370,968	731,275	89,475	13.94
Pingelly	918	499	479	978	60	6.54
Pinjarra (U)	1,191	584	612	1,196	5	0.42
Port Denison	n.a.	287	235	522	..	..
Port Hedland (U)	7,229	6,483	4,661	11,144	3,915	54.16
Quairading	856	412	396	808	—48	—5.61
Quinns	n.a.	293	267	560	..	..
Ravensthorpe	238	137	119	256	18	7.56
Rockingham (U)	12,029	8,948	8,745	17,693	5,664	47.09
Roebourne (U)	1,515	746	622	1,368	—147	—9.70
Shay Gap	n.a.	599	257	856	..	..
Southern Cross	895	462	418	880	—15	—1.68
Tambellup	406	206	171	377	—29	—7.14
Tammin	365	149	139	288	—77	—21.10
Three Springs	554	325	280	605	51	9.21
Tom Price (U)	3,426	1,854	1,339	3,193	—233	—6.80
Toodyay	581	281	269	550	—31	—5.34
Two Rocks	n.a.	349	312	661	..	..
Wagin (U)	1,633	854	804	1,658	25	1.53
Walpole	222	142	120	262	40	18.02
Wanneroo (U)	1,526	2,140	2,179	4,319	2,793	183.03
Waroona (U)	1,162	589	571	1,160	—2	—0.17
Wickepin	294	132	114	246	—48	—16.33
Wickham	n.a.	1,526	786	2,312	..	..
Williams	450	243	232	475	25	5.56
Wittenoom	422	578	384	962	540	127.96
Wongan Hills	881	463	425	888	7	0.79
Wundowie (U)	1,042	524	445	969	—73	—7.01
Wyalkatchem	573	274	260	534	—39	—6.81
Wyndham (U)	1,515	771	612	1,383	—132	—8.71
Yanchep Beach	n.a.	201	183	384	..	..
Yarloop	519	247	236	483	—36	—6.94
York (U)	1,177	564	544	1,108	—69	—5.86

(a) Figures as recorded at the Census.

### Population in Statistical Divisions

In 1929, when statistics were first presented according to statistical divisions, Western Australia was divided into seven such areas. At the 1976 Census there were nine statistical divisions, and these have been used as the basis of compilation of the particulars in the next table.

For further information on the origin and purpose of statistical divisions see Chapter III — *Constitution and Government*.

The estimated population of the Perth Statistical Division at 30 June 1976 was 820,100, or 70.1 per cent of the State total, compared with 711,800 (68.2 per cent) five years earlier, an increase of 108,300 persons or 15.2 per cent. The State's natural increase between the Censuses was 66,718 of which the Perth Statistical Division contributed 40,971. In addition, this division experienced a net gain by migration of 67,300.

The total population in the area outside the Perth Statistical Division rose by 18,400 or 5.55 per cent. The natural increase recorded in the area was 25,747, so that there was a loss of 7,347 persons by migration.

The South-Eastern Statistical Division, and Carnegie and De Grey Statistical Sub-divisions together comprised an area of 1,565,151 square kilometres (or almost two-thirds of the State) and had a population of only 63,425 persons as recorded at the Census of 30 June 1976. A low rainfall renders much of it virtually uninhabitable and desert or near-desert conditions prevail over some 900,000 square kilometres including much of the eastern and northern parts of the area and extending into the southern portion of the Kimberley Statistical Division. Almost no part of this desert area has an annual rainfall greater than 250 millimetres and a considerable proportion has much less. Of the total population of 63,425 persons recorded in the three areas at the Census, over four-fifths were enumerated in the urban centres of Kalgoorlie-Boulder (19,041), Port Hedland (11,144), Esperance (5,262), Kambalda (4,784), Newman (4,672) and Norseman (2,029), and the townships of Goldsworthy (989), Meekatharra (829), Shay Gap (856), Southern Cross (880), Laverton (848), Coolgardie (643), Leonora (468), Mount Magnet (362), Marble Bar (262), Cue (258) and Ravensthorpe (256).

### Population North of 26° S Latitude

For administrative and other purposes, the portion of the State lying north of the 26th parallel of latitude frequently has special significance. This area, which embraces part of the Central Statistical Division, and the whole of the Pilbara and Kimberley Statistical Divisions, is 1,371,367 square kilometres in extent and is therefore somewhat greater in area than half the entire State. It had a population, as recorded at the Censuses, of 58,616 persons in 1971 and 65,086 in 1976. Of this total, over three-quarters were enumerated in the ports and other coastal settlements of Port Hedland (11,144), Carnarvon (5,341), Karratha (4,243), Broome (2,920), Dampier (2,727), Derby (2,411), Exmouth (2,336), Wickham (2,312), Wyndham (1,383), Roebourne (1,368), Denham (346) and Onslow (220); the iron ore mining centres of Newman (4,672), Tom Price (3,193), Paraburdoo (2,402), Goldsworthy (989) and Shay Gap (856); the Ord River agricultural settlement at Kununurra (1,540); and the townships of Wittenoom (962), Halls Creek (767) and Marble Bar (262).

### Population Density

Urban Perth is the most densely populated part of the State. Among the statistical divisions, Perth with a population of 820,100 and 5,368 square kilometres in area showed the highest density, 153 persons per square kilometre. The Kimberley Statistical Division was the most sparsely populated with an area of 421,451 square kilometres (more than one-sixth of the entire State) and a population of only 15,600 persons, equivalent to an average of one person to every twenty-seven square kilometres.

The next table shows the area, population and density of the State and of each statistical division at the Census of 30 June 1976.



STATISTICAL DIVISIONS — AREA, POPULATION AND DENSITY  
CENSUS, 30 JUNE 1976

Statistical division	Area (a)		Population (b)		
	Square kilometres	Per cent of total	Persons	Per cent of total	Density (per square kilometre)
Perth Statistical Division	5,368	0.21	820,100	70.11	152.78
Other divisions —					
South-West	26,661	1.06	84,250	7.20	3.16
Lower Great Southern	40,525	1.60	39,970	3.42	0.99
Upper Great Southern	45,687	1.81	24,150	2.06	0.53
Midlands	110,262	4.37	52,060	4.45	0.47
South-Eastern	614,388	24.33	41,150	3.52	0.07
Central (c)	753,365	29.83	49,920	4.27	0.07
Pilbara	510,335	20.21	39,950	3.42	0.08
Kimberley	421,451	16.69	15,600	1.33	0.04
Total	2,522,674	99.89	347,050	29.67	0.14
Total, all divisions	2,525,500	100.00	1,167,150	99.77	0.46
Migratory (d)	..	..	2,650	0.23	..
WESTERN AUSTRALIA	2,525,500	100.00	1,169,800	100.00	0.46

(a) See Chapter II, Part 1. (b) Census figures adjusted to take account of under-enumeration.  
(c) Includes Houtman Abrolhos (unincorporated). (d) Refers to persons (both passengers and crew) who, at midnight on census night, were enumerated on board ships in Western Australian ports, or ships which had left an Australian port before census night for a next port of call in Western Australia. It includes also those who were enumerated on long-distance trains, motor coaches or aircraft.

Western Australia had a population density at the 1976 Census of only 0.46 persons per square kilometre, compared with an average of 1.81 for Australia as a whole. Victoria was the most densely populated State, having an average of 16.46 persons per square kilometre.

AREA, POPULATION AND DENSITY — STATES AND TERRITORIES:  
CENSUS, 30 JUNE 1976

State or Territory	Area (a)		Population (b)			
	Square kilometres	Per cent of total	Males	Females	Persons	Density (per square kilometre)
	'000		'000	'000	'000	
New South Wales	801.6	10.43	2,455.8	2,458.4	4,914.3	6.13
Victoria	227.6	2.96	1,870.1	1,875.9	3,746.0	16.46
Queensland	1,727.2	22.48	1,063.2	1,048.5	2,111.7	1.22
South Australia	984.0	12.81	629.9	631.7	1,261.6	1.28
Western Australia	2,525.5	32.87	596.8	573.1	1,169.8	0.46
Tasmania	67.8	0.88	204.1	203.2	407.4	6.01
Northern Territory	1,346.2	17.52	56.2	45.2	101.4	0.08
Australian Capital Territory	2.4	0.03	103.2	100.1	203.3	84.71
AUSTRALIA	7,682.3	100.00	6,979.4	6,936.1	13,915.5	1.81

(a) See Chapter II, Part 1. (b) Census figures adjusted to take account of under-enumeration.

### ABORIGINAL POPULATION

Reference is made at the beginning of this Part to the exclusion of *full-blood* Aborigines from the tabulations of census data prior to 1971. Aborigines have, however, been enumerated at all censuses of the Commonwealth, although the degree of coverage and information obtained have varied substantially since 1911. Since the Census taken in 1933, the adequacy of the particulars obtained has improved progressively, as a result of an increasing number of Aborigines coming into contact with more populated areas.

At the 1971 and 1976 Censuses the question relating to a person's race differed from that asked at previous censuses and the figures shown in the tables in this section are therefore not comparable with those from earlier censuses.

**ABORIGINAL POPULATION (a) — STATISTICAL DIVISIONS  
WESTERN AUSTRALIA: CENSUS, 30 JUNE 1976**

Statistical division	Persons			Per cent of total
	Males	Females	Number	
Perth Statistical Division	2,939	3,193	6,133	23.47
Other divisions —				
South-West	423	374	797	3.05
Lower Great Southern	630	505	1,135	4.34
Upper Great Southern	558	511	1,069	4.09
Midlands	916	897	1,814	6.94
South-Eastern	1,035	1,026	2,062	7.89
Central	2,082	2,003	4,084	15.63
Pilbara	1,376	1,287	2,663	10.19
Kimberley	3,215	3,134	6,349	24.30
<b>Total</b>	<b>10,235</b>	<b>9,737</b>	<b>19,973</b>	<b>76.45</b>
<b>Total all divisions</b>	<b>13,174</b>	<b>12,930</b>	<b>26,106</b>	<b>99.92</b>
Migratory (b)	20	1	21	0.08
<b>WESTERN AUSTRALIA</b>	<b>13,195</b>	<b>12,931</b>	<b>26,126</b>	<b>100.00</b>

(a) Includes Torres Strait Islanders. (b) See letterpress in the earlier section *Geographical Distribution*.

In the next table, details are given of the age distribution of the Aboriginal population recorded at the 1976 Census.

**ABORIGINAL POPULATION (a) — AGE  
DISTRIBUTION WESTERN AUSTRALIA:  
CENSUS, 30 JUNE 1976**

Age last birthday (years)	Persons			Per cent of total
	Males	Females	Number	
0 — 4	1,943	1,947	3,890	14.89
5 — 9	2,100	2,046	4,146	15.87
10 — 14	1,973	1,850	3,823	14.63
15 — 19	1,539	1,467	3,006	11.51
20 — 24	1,185	1,113	2,298	8.80
25 — 29	922	914	1,836	7.03
30 — 34	680	667	1,347	5.16
35 — 39	517	640	1,157	4.43
40 — 44	506	524	1,030	3.94
45 — 49	442	443	885	3.39
50 — 54	343	315	658	2.52
55 — 59	262	240	502	1.92
60 — 64	194	263	457	1.75
65 and over	590	502	1,092	4.18
<b>Total</b>	<b>13,195</b>	<b>12,931</b>	<b>26,126</b>	<b>100.00</b>

(a) Includes Torres Strait Islanders.

**ESTIMATES OF POPULATION**

For dates other than those of the periodic census of population, estimates are based on records of births and deaths and of movements of population interstate and overseas. Estimates of the population of Australia and of each of the States and Territories are prepared by the Australian Statistician as at 31 March, 30 June, 30 September and 31 December in each year. Because the available records of interstate movement are incomplete, these intercensal estimates as they apply to States and Territories are approximate and are revised when the results of the next succeeding census become known.

**Mean Population**

It is often useful to relate a given characteristic to population in order to express it in *per capita* terms or as 'per head of population'. In some cases it is appropriate to relate a

characteristic to the population as at a specified date as, for example, savings bank balances per head of population at 30 June, or motor vehicles per head of population at 31 December.

Where events, as for instance births or deaths, are taking place continuously throughout a period, it is obviously not appropriate to relate these events to the population as at a specific date. It is necessary, therefore, to devise a measure which takes account of the change in population which occurs continuously throughout any period. This measure is known as the *mean population*.

As stated earlier, estimates of population are prepared as at the end of each quarter of the year. The mean population of a quarter might be taken to be the average, or arithmetic mean, of the populations at the beginning and the end of the quarter. If  $a$  represents the population at the beginning of year and  $b, c, d$  and  $e$  the populations at the end of the first, second, third and fourth quarters, respectively, these quarterly means would then be  $\frac{1}{2}(a + b)$  for the first quarter,  $\frac{1}{2}(b + c)$  for the second,  $\frac{1}{2}(c + d)$  for the third and  $\frac{1}{2}(d + e)$  for the fourth quarter. The mean population for the year might then be taken as the arithmetic mean of the four quarterly average populations, or

$$\frac{1}{4}[\frac{1}{2}(a + b) + \frac{1}{2}(b + c) + \frac{1}{2}(c + d) + \frac{1}{2}(d + e)]$$

which may be more simply expressed as  $\frac{1}{8}(a + 2b + 2c + 2d + e)$ . This method of deriving mean population had been in use in Western Australia prior to its general adoption by the 1903 Conference of Australian Statisticians. It was later superseded by the more precise measure

$$\frac{1}{12}(a + 4b + 2c + 4d + e)$$

which is now commonly used in Australian statistics. In order to establish uniformity with current practice, estimates of mean population for 1901 and later years were revised, where necessary, by the application of this formula.

The estimated mean population of Western Australia is shown in the next table for each financial and calendar year in the period from 1 January 1974 to 30 June 1980.

POPULATION ESTIMATES (a)  
(<sup>000</sup>)

Year	Population at end of year			Increase during year			Mean population		
	Males	Females	Persons	Natural increase (b)	Estimated net migration (c)	Estimated total increase (d)	Males	Females	Persons
YEAR ENDED 30 JUNE									
1975	585.0	561.7	1,146.7	12.6	16.2	r29.0	578.6	554.5	1,133.1
1976	(e) 596.8	(e) 573.1	(e) 1,169.8	12.6	r9.2	r22.0	590.7	567.5	1,158.2
1977	609.8	587.3	1,197.1	13.0	14.2	27.2	603.1	580.2	1,183.3
1978	622.3	600.0	1,222.3	13.2	12.0	25.2	616.4	594.0	1,210.5
1979r	632.5	610.4	1,242.8	12.7	7.8	20.5	627.1	605.0	1,232.1
1980	642.5	622.5	1,265.0	12.2	9.9	22.1	637.3	616.3	1,253.6
YEAR ENDED 31 DECEMBER									
1974	581.0	556.9	1,137.8	12.4	21.7	34.6	571.0	546.8	1,117.7
1975	591.1	567.9	1,159.0	12.4	8.3	r21.0	585.2	561.7	1,146.9
1976	603.2	580.5	1,183.7	12.9	r10.7	r24.0	596.7	573.6	1,170.3
1977	616.7	594.4	1,211.1	12.8	14.7	27.4	609.8	587.3	1,197.0
1978	626.9	604.8	1,231.7	12.8	7.8	20.6	622.2	599.9	1,222.1
1979	637.1	616.5	1,253.6	12.4	9.5	21.9	632.2	610.4	1,242.7

(a) Population estimates for periods prior to June 1976 have been revised in accordance with the 1976 Census figure adjusted to take account of under-enumeration. (b) Excess of births registered over deaths registered. (c) Interstate and overseas. (d) For periods between the Censuses of 30 June 1971 and 1976 includes an adjustment to balance net migration and recorded births and deaths with the June 1976 estimates of population aged 0-4 years. (e) Census figures adjusted to take account of under-enumeration. (f) Adjusted to negate the effect on the population of Western Australia of evacuees from Darwin as a result of cyclone 'Tracy'.

### Population Estimates

As a result of the repeal, with effect from 10 August 1967, of section 127 of the Commonwealth Constitution, to which reference is made earlier, current population estimates

no longer exclude full-blood Aborigines. Estimates for earlier dates and periods back to the Census of 30 June 1961 have also been prepared on the basis of *total* population (i.e. including Aborigines). Population figures for periods between the Censuses of 30 June 1971 and 1976 have been revised in accordance with the results of the 1976 Census, adjusted to take account of under-enumeration. Figures for dates and periods subsequent to 30 June 1976 are subject to revision in accordance with the results of the next census.

POPULATION ESTIMATES — STATES AND TERRITORIES  
(‘000)

State or Territory	Estimated population at 31 December —					
	1975	1976	1977	1978	1979	1980p
New South Wales	4,895.8	4,933.0	4,979.3	5,043.3	5,111.7	5,183.3
Victoria	3,730.3	3,764.9	3,799.4	3,835.9	3,869.2	3,907.9
Queensland	2,102.2	2,121.6	2,155.1	2,179.6	2,222.7	2,275.7
South Australia	1,257.3	1,268.8	1,283.8	1,291.1	1,296.3	1,302.4
Western Australia	1,159.0	1,183.7	1,211.1	1,231.7	1,253.6	1,276.7
Tasmania	406.6	409.3	412.1	415.6	420.5	424.6
Northern Territory	97.8	103.9	110.0	114.3	118.4	125.9
Australian Capital Territory	200.4	206.2	212.7	219.3	224.2	230.2
AUSTRALIA	13,849.3	13,991.2	14,163.5	14,330.9	14,516.5	14,726.7

## Chapter IV— continued

### Part 2 — Births, Deaths and Marriages

#### THE REGISTRATION SYSTEM

Compulsory registration of births, deaths and marriages in Western Australia was originally provided for by legislation of the year 1841. The Statutes currently in force are the *Registration of Births, Deaths and Marriages Act 1961-1979* (State) and the *Marriage Act 1961* (Commonwealth). For administrative purposes, the State is divided into twenty-six Registry Districts, each having a District Registrar. Particulars of births, deaths and marriages reported to the District Registrars are sent to the Registrar-General at Perth, where a central registry office has been maintained since 1841. Local registers are kept at each district office.

Births are required to be registered within sixty days of the event, and must be notified by the father, the mother or the occupier of the premises where the birth took place. Special provisions and penalties apply to notification and registration after the expiration of the sixty-day period.

A stillbirth is required to be registered both as a birth and a death. From 1 January 1968 the term 'stillbirth', for registration purposes, refers to a child, not born alive, of at least twenty weeks' gestation, or with a birthweight of at least 400 grams. Previously it was restricted to cases where the gestation period was at least twenty-eight weeks.

Deaths are required to be registered within fourteen days. Notification must be given by the person who disposes of the body or by the occupier of the premises where the death occurred. As in the case of births, special provisions and penalties exist for the late registration of a death.

Marriages are celebrated by persons authorised as celebrants under the provisions of the *Marriage Act 1961* (Commonwealth). These may be ministers of religion, District Registrars, or other authorised persons. Celebrants other than District Registrars are required to lodge a marriage certificate with the District Registrar for registration within fourteen days of the celebration of a marriage. A penalty fee is provided for registrations after fourteen days from the date of marriage.

Statistics of births, deaths and marriages are prepared from the registration documents.

The following table shows, for the years 1977 to 1979, the number of births and deaths registered in Western Australia, classified according to statistical divisions. The figures do not necessarily represent the number of such events which actually occurred in a particular statistical division during each year, since births are allocated to the usual place of residence of the mother and deaths to the usual place of residence of the deceased. Further, the statistics are compiled according to date of registration and not date of occurrence.

The statistical divisions shown on the following page are as they existed at 30 June 1980 and their component local government areas are given in lists at the end of Chapter III.

Additional information concerning births, deaths, marriages and divorce is contained in the annual publication *Demography* (Catalogue No. 3101.5) published by the Western Australian Office of the Bureau. Details of the number of births and deaths relating to individual local government areas in the State appear in *Local Government* (Catalogue No. 1303.5).

### BIRTHS AND DEATHS — NUMBERS REGISTERED STATISTICAL DIVISIONS (a)

Statistical division (a)	Live births			Deaths (b)		
	1977	1978	1979	1977	1978	1979
Perth Statistical Division	13,571	13,719	13,685	5,796	5,662	5,925
Other divisions —						
South-West	1,523	1,545	1,562	617	635	655
Lower Great Southern	787	804	791	269	294	276
Upper Great Southern	517	505	499	125	112	112
Midlands	1,016	976	976	277	269	290
South-Eastern	808	745	719	312	287	282
Central	1,018	970	884	281	281	224
Pilbara	1,007	929	939	102	133	119
Kimberley	404	418	414	120	121	137
Total	7,080	6,892	6,784	2,103	2,132	2,095
WESTERN AUSTRALIA	20,651	20,611	20,469	7,899	7,794	8,020

(a) For component local government areas, see lists at the end of Chapter III.

(b) Stillbirths are not included; see next table.

### BIRTHS

Statistics of births registered in each of the six years 1974 to 1979 in the Perth Statistical Division, the rest of the State, and in Western Australia as a whole are shown in the following table. Additional details of stillbirths appear later in this Part.

#### BIRTHS REGISTERED

Year	Live births				Multiple births (b)	Stillbirths
	Males (a)	Females (a)	Persons (a)	Ex-nuptial births		
PERTH STATISTICAL DIVISION						
1974	6,792	6,521	13,313	1,238	244	170
1975	6,918	6,488	13,406	1,309	279	146
1976	6,931	6,557	13,488	1,342	219	156
1977	7,070	6,501	13,571	1,308	251	120
1978	7,046	6,673	13,719	1,407	286	136
1979	6,950	6,735	13,685	1,521	267	117
OTHER DIVISIONS						
1974	3,490	3,404	6,894	1,114	108	104
1975	3,542	3,390	6,932	1,218	136	90
1976	3,732	3,450	7,182	1,279	106	86
1977	3,647	3,433	7,080	1,220	131	70
1978	3,611	3,281	6,892	1,247	149	63
1979	3,455	3,329	6,784	1,262	125	67
WESTERN AUSTRALIA						
1974	10,282	9,925	20,207	2,352	352	274
1975	10,460	9,878	20,338	2,527	415	236
1976	10,663	10,007	20,670	2,621	325	242
1977	10,717	9,934	20,651	2,528	382	190
1978	10,657	9,954	20,611	2,654	435	199
1979	10,405	10,064	20,469	2,783	392	184

(a) Includes ex-nuptial births and multiple births. (b) Number of live-born children.

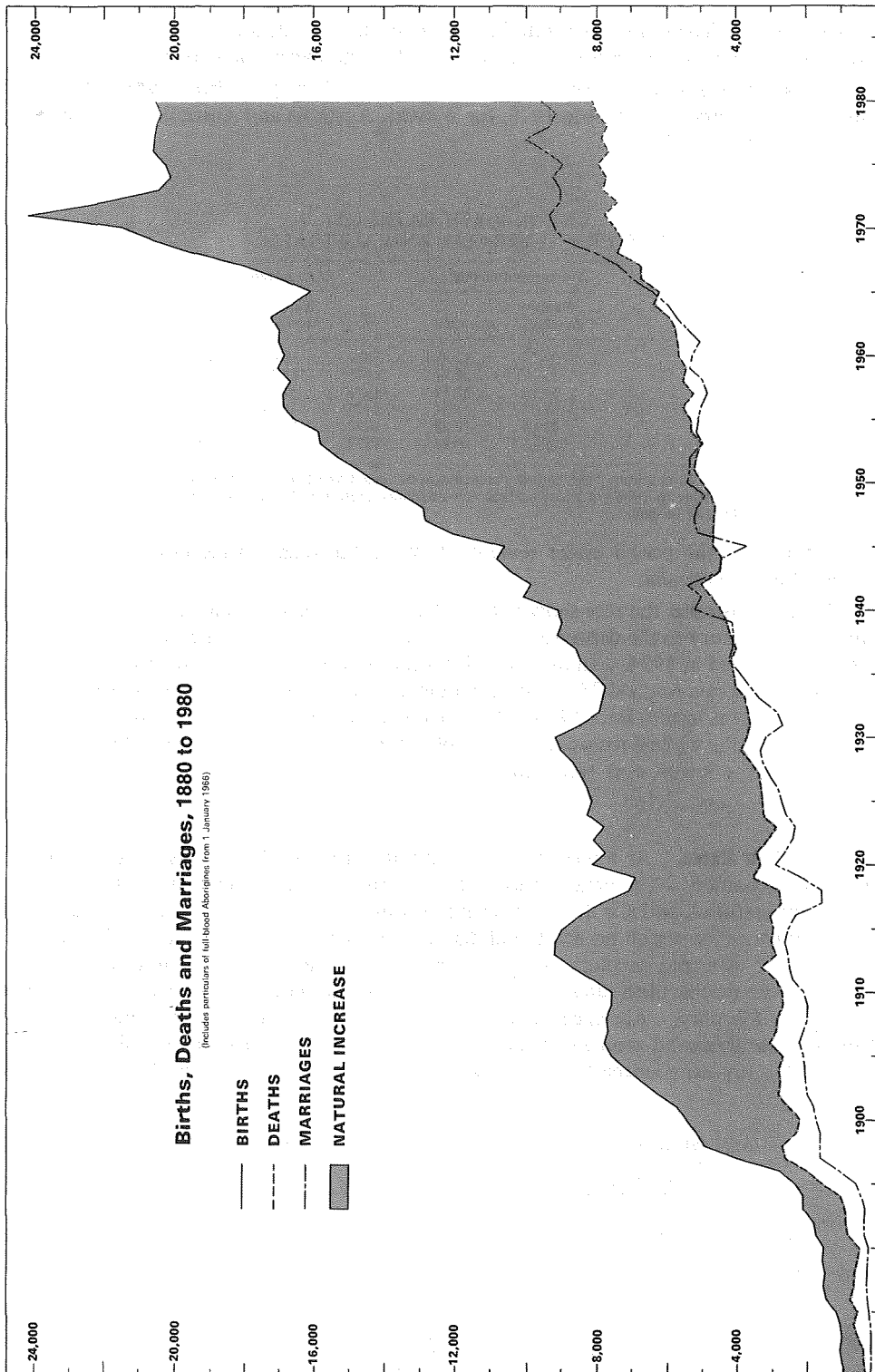
In the following table, births registered in Western Australia during each of the years 1974 to 1979 are classified according to age of mother.

## BIRTHS REGISTERED — AGE OF MOTHER

Age of mother (years)	1974	1975	1976	1977	1978	1979
NUPTIAL BIRTHS						
14	—	—	—	—	—	—
15	6	3	3	—	2	—
16	63	59	55	47	33	24
17	217	171	160	150	112	83
18	427	425	351	300	264	222
19	697	624	594	571	488	428
20	916	934	882	782	738	648
21-24	5,608	5,565	5,595	5,435	5,230	5,005
25-29	6,583	6,708	7,044	7,103	7,296	7,227
30-34	2,444	2,460	2,554	2,953	3,003	3,215
35-39	744	715	679	668	691	749
40-44	143	135	123	110	93	82
45 and over	7	12	9	4	7	3
Not stated	—	—	—	—	—	—
Total, nuptial births	17,855	17,811	18,049	18,123	17,957	17,686
EX-NUPTIAL BIRTHS						
Under 14	1	2	5	2	3	2
14	12	14	10	13	16	21
15	60	65	76	51	68	60
16	145	177	165	127	133	141
17	230	226	242	221	208	223
18	254	264	243	243	234	264
19	232	247	237	251	252	286
20	184	221	217	231	241	239
21-24	575	592	641	655	688	726
25-29	352	415	470	430	478	491
30-34	165	189	196	199	230	231
35-39	89	80	84	81	82	76
40-44	27	20	27	19	18	19
45 and over	2	1	5	2	—	4
Not stated	24	14	3	3	3	—
Total, ex-nuptial births	2,352	2,527	2,621	2,528	2,654	2,783
TOTAL BIRTHS						
Under 14	1	2	5	2	3	2
14	12	14	10	13	16	21
15	66	68	79	51	70	60
16	208	236	220	174	166	165
17	447	397	402	371	320	306
18	681	689	594	543	498	486
19	929	871	831	822	740	714
20	1,100	1,155	1,099	1,013	979	887
21-24	6,183	6,157	6,236	6,090	5,918	5,731
25-29	6,935	7,123	7,514	7,533	7,774	7,718
30-34	2,609	2,649	2,750	3,152	3,233	3,446
35-39	833	795	763	749	773	825
40-44	170	155	150	129	111	101
45 and over	9	13	14	6	7	7
Not stated	24	14	3	3	3	—
Total, births	20,207	20,338	20,670	20,651	20,611	20,469

**Ex-nuptial Live Births.** A birth is registered as ex-nuptial if the parents were not married to one another at the time of the confinement. Ex-nuptial births in 1979 comprised 13.60 per cent of all births registered.

**Legitimations.** Under the provisions of the *Marriage Act* 1961 (Commonwealth) which came into operation on 1 September 1963, a child whose parents were not married to each other at the time of its birth becomes legitimised on the subsequent marriage of its parents. The legitimisation takes place whether or not there was a legal impediment to the marriage of the parents at the time of the child's birth, and whether or not the child was still living at the time of the marriage, or in the case of a child born before 1 September 1963, at that date.





**Crude Birth Rates.** The crude birth rate in any period may be defined as the number of live births occurring during the period for every thousand of the mean population.

The average annual rates for each five-year period in the thirty years from 1946 to 1975 and the rates for single years from 1974 to 1979, for Western Australia and Australia as a whole, are shown in the following table.

CRUDE BIRTH RATES (a)  
WESTERN AUSTRALIA AND AUSTRALIA

Period	Average annual rate		Year	Annual rate	
	Western Australia	Australia		Western Australia	Australia
1946-50	25.24	23.39	1974	18.08	18.03
1951-55	25.37	22.86	1975	17.73	16.92
1956-60	24.20	22.59	1976	17.66	16.37
1961-65	21.71	21.34	1977	17.25	16.08
1966-70	21.14	19.95	1978	16.86	15.73
1971-75	19.65	18.95	1979	16.47	15.47

(a) Rates prior to 1966 exclude particulars of full-blood Aborigines. Rates for years prior to 1976 are based on final census results; those for 1976 and later are subject to revision.

In each year of the period under review, Western Australia's crude birth rate has been higher than that of Australia.

In Western Australia, the rate showed a marked and almost continuous decrease from the beginning of the century to the depression of thirty years later when the unprecedentedly low rate of 17.64 was recorded in 1934. In the following years a fairly consistent increase was evident until 1952 when the rate reached 25.66, its highest level since 1917. The rate then declined and in 1965 was 19.85, the lowest since 1940. It increased in each succeeding year until 1971 when the rate was 23.26, the highest recorded since 1959. It fell in each of the next eight years and in 1979 was 16.47, the lowest ever recorded.

**Age-specific Birth Rates.** As a measure of fertility, the crude birth rate has the advantage of simplicity in calculation. The data necessary for its computation are usually readily available from published statistics, and it is therefore useful in comparing the fertility of the populations of States and countries for which no additional data are available. However, it is of limited use, since it does not take into account the important factors of age and sex composition of the population. Age-specific birth rates, which do have regard to these factors, therefore provide a better measure of fertility. Age-specific birth rates represent the number of births to women of specified ages per thousand women of those particular ages, and thus take cognisance of the variations in fertility experienced by women at the successive stages of their child-bearing life.

AGE-SPECIFIC BIRTH RATES (a) — WESTERN AUSTRALIA

Year	Age group (years)						
	15-19	20-24	25-29	30-34	35-39	40-44	45-49
1947	32.63	187.14	206.24	146.72	84.97	28.63	2.06
1954	42.74	231.09	217.77	135.74	71.71	23.61	1.52
1961	47.07	246.94	231.92	127.38	61.82	20.55	1.17
1966	53.81	203.08	197.12	102.12	45.68	13.27	1.38
1971	63.33	204.90	203.58	101.91	41.96	9.89	0.73
1976	40.51	143.93	149.45	70.33	21.82	5.00	0.47

(a) Number of live births registered per 1,000 women in each age group. Rates are based on census results and exclude particulars of full-blood Aborigines prior to 1966.

For purposes of comparison with Western Australian experience, age-specific birth rates for Australia as a whole are given in the following table.

## AGE-SPECIFIC BIRTH RATES (a) — AUSTRALIA

Year	Age group (years)						
	15-19	20-24	25-29	30-34	35-39	40-44	45-49
1947	32.06	166.18	186.60	129.99	75.02	23.52	1.81
1954	39.19	197.13	194.02	121.76	64.43	20.16	1.47
1961	47.35	225.81	221.21	131.11	63.38	19.17	1.41
1966	49.26	172.81	183.29	105.28	50.60	14.28	1.09
1971	55.17	180.92	195.39	102.26	44.90	11.42	0.78
1976	35.55	129.22	147.34	73.06	24.28	5.57	0.41

(a) Number of live births registered per 1,000 women in each age group. Rates are based on census results and exclude particulars of full-blood Aborigines prior to 1966.

**Gross and Net Reproduction Rates.** The gross reproduction rate is derived from fertility rates representing the number of *female* births to women of specified ages per thousand women of those particular ages. It provides a measure of the number of female children who would be born, on the average, to every woman assuming that she lives through the whole of the child-bearing period and that the basic fertility rates remain unaltered throughout.

The gross reproduction rate assumes that all females survive to the end of their child-bearing capacity. A more accurate measure, which takes into account the effect of mortality among women during this period is the net reproduction rate. This rate represents the average number of female children who would be born to women during their lifetime if they were subject in each succeeding year of life to the fertility and mortality rates on which the calculation is based. The net reproduction rate is a measure of the number of women who, in the next generation, will replace the women of reproductive age in the current generation. It provides a useful indication of likely future population trends. A rate remaining stationary at unity indicates an ultimately static population. If a rate greater than unity is maintained, an ultimate increase of population will result, while a continuing rate less than unity will lead to an ultimate decline.

GROSS AND NET REPRODUCTION RATES (a)  
WESTERN AUSTRALIA AND AUSTRALIA

Year	Gross reproduction rate		Net reproduction rate	
	Western Australia	Australia	Western Australia	Australia
1947	1.683	1.494	(b) 1.595	(b) 1.416
1954	1.772	1.559	(c) 1.704	(c) 1.499
1961	1.785	1.728	(d) 1.730	(d) 1.672
1966	1.486	1.401	(e) 1.441	(e) 1.357
1971	1.516	1.427	(f) 1.473	(f) 1.386
1974	1.124	1.137	(g) 1.096	(g) 1.108
1975	1.066	1.053	(g) 1.041	(g) 1.028
1976	1.044	1.012	(g) 1.020	(g) 0.988
1977	1.009	0.987	(g) 0.987	(g) 0.965
1978	0.985	0.964	(g) 0.965	(g) 0.944
1979	0.978	0.941	(g) 0.958	(g) 0.922

(a) Rates are based on census results and exclude particulars of full-blood Aborigines prior to 1966. (b) Based on 1946-48 mortality experience. (c) Based on 1953-55 mortality experience. (d) Based on 1960-62 mortality experience. (e) Based on 1965-67 mortality experience. (f) Based on 1970-72 mortality experience. (g) Based on Annual Life Tables calculated by the Australian Statistician. Because of the method of calculation, these figures are subject to annual fluctuation which may not be indicative of a longer term trend.

## DEATHS

### DEATHS REGISTERED

Year	Deaths (a)			Infant deaths (b)		
	Males	Females	Persons	Males	Females	Persons
PERTH STATISTICAL DIVISION						
1974	3,158	2,427	5,585	92	82	174
1975	3,297	2,519	5,816	81	69	150
1976	3,112	2,529	5,641	81	67	148
1977	3,187	2,609	5,796	93	61	154
1978	3,107	2,555	5,662	67	52	119
1979	3,291	2,634	5,925	90	55	145
OTHER DIVISIONS						
1974	1,392	801	2,193	83	70	153
1975	1,404	752	2,156	73	48	121
1976	1,368	731	2,099	72	53	125
1977	1,346	757	2,103	54	43	97
1978	1,367	765	2,132	56	55	111
1979	1,302	793	2,095	63	39	102
WESTERN AUSTRALIA						
1974	4,550	3,228	7,778	175	152	327
1975	4,701	3,271	7,972	154	117	271
1976	4,480	3,260	7,740	153	120	273
1977	4,533	3,366	7,899	147	104	251
1978	4,474	3,320	7,794	123	107	230
1979	4,593	3,427	8,020	153	94	247

(a) Including infant deaths. (b) Deaths occurring in the first year of life.

**Crude Death Rates.** The crude death rate is perhaps the most common measure of mortality, and is derived by relating the deaths occurring in a period to the mean population for that period. It is usually expressed as number of deaths per thousand of mean population.

The average annual rates for each five-year period in the thirty years from 1946 to 1975 and the rates for single years from 1974 to 1979, for Western Australia and Australia as a whole, are shown in the following table.

### CRUDE DEATH RATES (a) WESTERN AUSTRALIA AND AUSTRALIA

Period	Average annual rate (b)		Year	Annual rate (b)	
	Western Australia	Australia		Western Australia	Australia
1946-50 (c)	9.23	9.74	1974	6.96	8.52
1951-55	8.49	9.25	1975	6.95	7.91
1956-60	7.90	8.78	1976	6.61	8.10
1961-65	7.78	8.75	1977	6.60	7.73
1966-70	7.84	8.90	1978	6.38	7.61
1971-75	7.10	8.31	1979	6.45	7.39

(a) Rates prior to 1966 exclude particulars of full-blood Aborigines. (b) Rates for years prior to 1976 are based on final census results; those for 1976 and later are subject to revision. (c) Excludes deaths of members of defence forces to June 1947.

In the early years of the century, the Western Australian rate was higher than that for Australia as a whole, but fell below the Australian average in 1909. Since that time, the rate for Western Australia has, with very few exceptions, remained lower than that for Australia.

Western Australia's crude death rate for the year 1902 was 13.79 per thousand of the mean population but by 1931 it had fallen to 8.51. After that year, the rate increased until it reached 10.65 in 1942. Then there was a general decline until 1963 when the rate was 7.68. The rate for 1978 was 6.38 per thousand of mean population, the lowest ever recorded in Western Australia.

**Standardised Death Rates.** The crude death rate expresses simply the number of deaths occurring in a population during any period as a proportion of the mean population for that period. Although this rate is useful as a measure of the absolute level of mortality, its value is necessarily restricted when comparing the mortality in different communities in the same period, or in one community at different times.

The effect on the crude death rate of the presence in a community of a high proportion of young people or of aged people, or of a high or low masculinity, will be readily appreciated. To devise an adequate measure of comparative mortality, it is therefore necessary to select a 'standard' population to which the varying mortality experiences may be referred. A standard population compiled by the International Statistical Institute, based upon the age and sex distribution of the population of nineteen European countries at their censuses nearest to the year 1900, has been used as the basis of the standardised death rates for Western Australia and Australia given in the next paragraph. The rate is computed by applying to each sex and age group in the standard population, the death rates actually recorded in the corresponding groups of the State and Australian populations. The sum of these results represents the number of deaths which would have occurred in the standard population if it had been exposed to the same risks of mortality. The standardised death rate is derived by expressing this number in terms of 'per thousand of the standard population'.

For the Census years 1921, 1933, 1947, 1954, 1961 and 1966 the standardised death rates for Western Australia were 11.88, 8.74, 7.28, 6.71, 6.02 and 6.25, and the corresponding rates for Australia as a whole were 10.58, 8.62, 7.34, 6.90, 6.27 and 6.53. These rates have been compiled on a basis which excludes full-blood Aborigines. The rates for 1971 and 1976, calculated on the basis of total population (i.e. including Aborigines), were 6.16 and 5.11 for Western Australia and 6.32 and 5.61 for Australia respectively.

**Causes of Death.** Statistics of causes of death provide important numerical facts by which to evaluate the varying health conditions and needs of different countries. In order to enable valid international comparisons, it is necessary that each country present its statistics of causes of death in a uniform manner. The first classification of causes of death to be adopted internationally was that compiled by Dr J. Bertillon at the request of the International Statistical Institute meeting in Vienna in 1891. Subsequently this classification was periodically revised by the Institute in collaboration with the League of Nations Health Organization. More recently, revisions have been carried out by a Committee of the World Health Organization.

#### PRINCIPAL CAUSES OF DEATH, 1979

International number	Cause of death	Males	Females	Persons	Per cent of all deaths	Rate (a)
000-139	Infective and parasitic diseases —					
010-012	Tuberculosis of respiratory system	6	1	7	0.1	0.6
	Other infective and parasitic diseases	37	19	56	0.7	4.5
140-239	Neoplasms —					
140-199	Malignant —					
150-159	Digestive organs and peritoneum	298	241	539	6.7	43.4
162	Trachea, bronchus and lung	340	72	412	5.1	33.2
174-175	Breast	1	141	142	1.8	11.4
179-189	Genito-urinary organs	148	124	272	3.4	21.9
	Other	177	111	288	3.6	23.2
200-208	Lymphatic and haematopoietic tissue —					
204-208	Leukaemia and aleukaemia	40	31	71	0.9	5.7
	Other	34	30	64	0.8	5.2
210-239	Benign, other and unspecified	18	14	32	0.4	2.6
240-279	Endocrine, nutritional and metabolic diseases —					
250	Diabetes mellitus	54	64	118	1.5	9.5
	Other	20	21	41	0.5	3.3
280-289	Diseases of blood and blood-forming organs	11	12	23	0.3	1.9
290-319	Mental disorders	55	35	90	1.1	7.2
320-389	Diseases of the nervous system and sense organs	58	59	117	1.5	9.4

PRINCIPAL CAUSES OF DEATH, 1979 — *continued*

International number	Cause of death	Males	Females	Persons	Per cent of all deaths	Rate (a)
390-459	Diseases of the circulatory system —					
393-398	Rheumatic heart disease	9	32	41	0.5	3.3
410-414	Ischaemic heart disease	1,326	844	2,170	27.1	174.6
430-438	Cerebrovascular disease	396	476	872	10.9	70.2
	Other	364	392	756	9.4	60.8
460-519	Diseases of the respiratory system —					
480-486	Pneumonia	74	82	156	1.9	12.6
490-493	Bronchitis, emphysema and asthma	134	39	173	2.2	13.9
	Other	197	91	288	3.6	23.2
520-579	Diseases of the digestive system	139	100	239	3.0	19.2
580-629	Diseases of the genito-urinary system	60	65	125	1.6	10.1
630-676	Complications of pregnancy, childbirth and the puerperium	—	5	5	0.1	0.4
680-709	Diseases of the skin and subcutaneous tissue	1	3	4	0.1	0.3
710-739	Diseases of the musculoskeletal system and connective tissue	8	15	23	0.3	1.9
740-759	Congenital anomalies	48	37	85	1.1	6.8
760-779	Certain conditions originating in the perinatal period	71	43	114	1.4	9.2
780-799	Symptoms, signs and ill-defined conditions	49	42	91	1.1	7.3
800-999	Accidents, poisonings and violence —					
810-825	Motor vehicle accidents	210	62	272	3.4	21.9
850-869	Accidental poisonings	7	8	15	0.2	1.2
880-888	Accidental falls	24	35	59	0.7	4.7
950-959	Suicide and self-inflicted injury	83	35	118	1.5	9.5
	Other	96	46	142	1.8	11.4
	All causes	4,593	3,427	8,020	100.0	645.4

(a) Per 100,000 of mean population.

The figures in the previous table have been compiled on the basis of the *International Statistical Classification of Diseases, Injuries, and Causes of Death* (Ninth Revision, 1975), operative from 1 January 1979. The term 'cause of death', as used in this table and elsewhere in this Part, means (a) the disease or injury which initiated the train of morbid events leading directly to death, or (b) the circumstances of the accident or violence which produced the fatal injury'.

**Infant Deaths.** The term 'infant death' refers to a death which occurs before the completion of the first year of life. In the following table, infant deaths registered in Western Australia during each of the six years to 1979 are classified according to age at death.

## INFANT MORTALITY — AGES AT DEATH

Year	Days					Total under 28 days	Months			Total under 1 year
	Under 1	1-6	7-13	14-20	21-27		Under 3	3-5	6-11	
MALES										
1974	61	39	10	3	1	114	137	16	22	175
1975	60	33	7	1	3	104	125	16	13	154
1976	59	27	4	1	4	95	114	25	14	153
1977	53	28	7	8	6	102	123	20	4	147
1978	52	22	6	1	3	84	98	15	10	123
1979	58	30	7	3	2	100	127	14	12	153

INFANT MORTALITY — AGES AT DEATH — *continued*

Year	Days					Total under 28 days	Months			Total under 1 year
	Under 1	1-6	7-13	14-20	21-27		Under 3	3-5	6-11	
FEMALES										
1974	55	32	10	1	6	104	123	15	14	152
1975	50	21	7	3	1	82	92	12	13	117
1976	42	23	11	3	2	81	91	13	16	120
1977	38	19	8	6	2	73	82	12	10	104
1978	40	24	2	3	2	71	79	14	14	107
1979	35	22	8	2	2	69	78	8	8	94
PERSONS										
1974	116	71	20	4	7	218	260	31	36	327
1975	110	54	14	4	4	186	217	28	26	271
1976	101	50	15	4	6	176	205	38	30	273
1977	91	47	15	14	8	175	205	32	14	251
1978	92	46	8	4	5	155	177	29	24	230
1979	93	52	15	5	4	169	205	22	20	247

**Infant Mortality Rates.** The infant mortality rate expresses the relationship between deaths of infants and the live births occurring in a period, and is stated in terms of number of deaths under one year of age per thousand live births.

The average annual rates for each five-year period in the thirty years from 1946 to 1975 and the rates for single years from 1974 to 1979, for Western Australia and Australia as a whole, are shown in the following table.

INFANT MORTALITY RATES (a)  
WESTERN AUSTRALIA AND AUSTRALIA

Period	Average annual rate		Year	Annual rate	
	Western Australia	Australia		Western Australia	Australia
1946-50	28.15	26.98	1974	16.18	16.14
1951-55	24.41	23.34	1975	13.32	14.27
1956-60	21.42	21.05	1976	13.21	13.83
1961-65	20.73	19.42	1977	12.15	12.47
1966-70	20.25	18.10	1978	11.16	12.20
1971-75	16.71	16.18	1979	12.07	11.36

(a) Rates prior to 1966 exclude particulars of full-blood Aborigines.

In the first decade of the century, the average annual rate (106.07) in Western Australia was considerably above the Australian average of 86.83, and was the highest of any State. Since then both the Western Australian and the Australian rates have shown a remarkable decrease. In the five years ended 1975, Western Australia's average annual rate was 16.71 compared with the Australian rate of 16.18.

**Causes of Infant Deaths.** The causes of infant deaths registered during the year 1979 are set out in the following table.

### INFANT MORTALITY — CAUSES OF DEATH, 1979

International number	Cause of death (a)	Males	Females	Persons
	Causes mainly of prenatal and natal origin —			
740-759	Congenital anomalies	37	29	66
765	Immaturity	22	12	34
767	Birth trauma	3	1	4
768	Hypoxia and birth asphyxia	3	13	16
769	Respiratory distress syndrome	8	2	10
770	Other respiratory conditions	8	6	14
771	Infections specific to the perinatal period	4	2	6
772	Foetal and neonatal haemorrhage	11	5	16
777	Perinatal disorders of digestive system	4	2	6
	Other	8	—	8
	Total	108	72	180
	Causes mainly of postnatal origin —			
001-009	Intestinal infectious diseases	3	—	3
038	Septicaemia	—	—	—
320-322, 036	Meningitis and meningococcal infection	2	3	5
480-486	Pneumonia	2	3	5
911	Inhalation or ingestion of food causing obstruction of respiratory tract or suffocation	1	1	2
	Other	37	15	52
	Total	45	22	67
	All causes	153	94	247

(a) Classified in accordance with the *International Statistical Classification of Diseases, Injuries, and Causes of Death* (Ninth Revision), operative from 1 January 1979.

**Stillbirths.** The infant mortality rate discussed above is that most commonly used, and takes no account of stillbirths. It is informative, however, to examine the occurrence of stillbirths in comparison with infant deaths, as in the next table, which deals with the experience of the six years 1974 to 1979.

### STILLBIRTHS AND INFANT DEATHS NUMBERS AND MASCULINITY

Year	Stillbirths				Infant deaths			
	Males	Females	Persons	Mascu- linity (a)	Males	Females	Persons	Mascu- linity (a)
1974	156	118	274	132.2	175	152	327	115.1
1975	124	112	236	110.7	154	117	271	131.6
1976	125	117	242	106.8	153	120	273	127.5
1977	111	79	190	140.5	147	104	251	141.3
1978	107	92	199	116.3	123	107	230	115.0
1979	97	87	184	111.5	153	94	247	162.8

(a) Number of males to each 100 females.

The relationship between stillbirths and infant deaths during the same period is further examined in the following table, which shows the numbers of stillbirths and of infant deaths at various ages. The rates shown are the number of stillbirths, or of infant deaths, per thousand of total births (i.e. including stillbirths). The average annual rate for the six-year period ended 1979 was 23.5.

### STILLBIRTHS AND INFANT DEATHS NUMBERS AND RATES

Year	Stillbirths	Infant deaths			Stillbirths and infant deaths
		Under 7 days	Under 28 days	Under 1 year	
NUMBER					
1974	274	187	218	327	601
1975	236	164	186	271	507
1976	242	151	176	273	515
1977	190	138	175	251	441
1978	199	138	155	230	429
1979	184	145	169	247	431
RATE (a)					
1974	13.4	9.1	10.6	16.0	29.3
1975	11.5	8.0	9.0	13.2	24.6
1976	11.6	7.2	8.4	13.0	24.6
1977	9.1	6.6	8.4	12.0	21.2
1978	9.6	6.6	7.4	11.1	20.6
1979	8.9	7.0	8.2	12.0	20.9

(a) Rate per 1,000 of total births (i.e. including stillbirths).

**Age-specific Death Rates.** The age-specific death rate expresses the number of deaths at specified ages in terms of the population at those particular ages. In the following table, which shows age-specific death rates for Western Australia, the average annual rates for each period relate to deaths in the three years surrounding the date of a population census. For census dates see table in Part 1 of this Chapter.

### AGE-SPECIFIC DEATH RATES (a) (b)

Age group (years)	1920-22	1932-34	1946-48	1953-55	1960-62	1965-67	1970-72	1975-77
MALES								
Under 1	} 23.9	12.8	9.3	7.0	(b) 22.9	(b) 22.1	(b) 20.6	(b) 14.3
1-4					1.2	1.2	1.2	1.0
5-9		2.2	1.6	0.9	0.7	0.5	0.5	0.4
10-14		1.4	1.4	0.6	0.5	0.4	0.4	0.4
15-19		2.4	1.8	1.5	1.6	1.2	1.4	1.4
20-24		4.0	2.5	2.2	2.0	1.7	1.6	1.8
25-29		4.1	2.9	2.0	1.9	1.5	1.5	1.3



AGE-SPECIFIC DEATH RATES (a) (b) — *continued*

Age group (years)	1920-22	1932-34	1946-48	1953-55	1960-62	1965-67	1970-72	1975-77
30-34	5.4	3.1	2.3	1.8	1.6	1.8	1.6	1.6
35-39	6.4	4.0	2.5	2.2	2.1	2.3	2.2	2.0
40-44	7.9	5.7	4.2	3.2	3.5	3.4	2.9	2.9
45-49	12.1	8.8	6.3	5.8	5.0	5.3	5.5	5.1
50-54	17.2	13.5	11.5	9.0	9.5	9.2	8.3	8.3
55-59	23.8	21.4	17.2	15.8	14.8	16.1	14.7	13.6
60-64	34.2	28.3	26.3	24.8	23.8	25.4	25.1	22.0
65-69	49.5	42.4	40.3	41.5	40.3	41.4	40.6	35.7
70-74	72.2	63.4	61.0	62.9	59.6	63.6	61.5	55.3
75-79	115.6	105.1	98.7	93.8	96.7	96.4	98.2	86.9
80-84	184.5	176.8	149.5	146.9	140.9	146.5	153.1	134.5
85-89	283.5	265.0	222.4	225.7	244.5	247.4	242.9	217.0
90 and over	566.7	380.8	376.2	297.4				

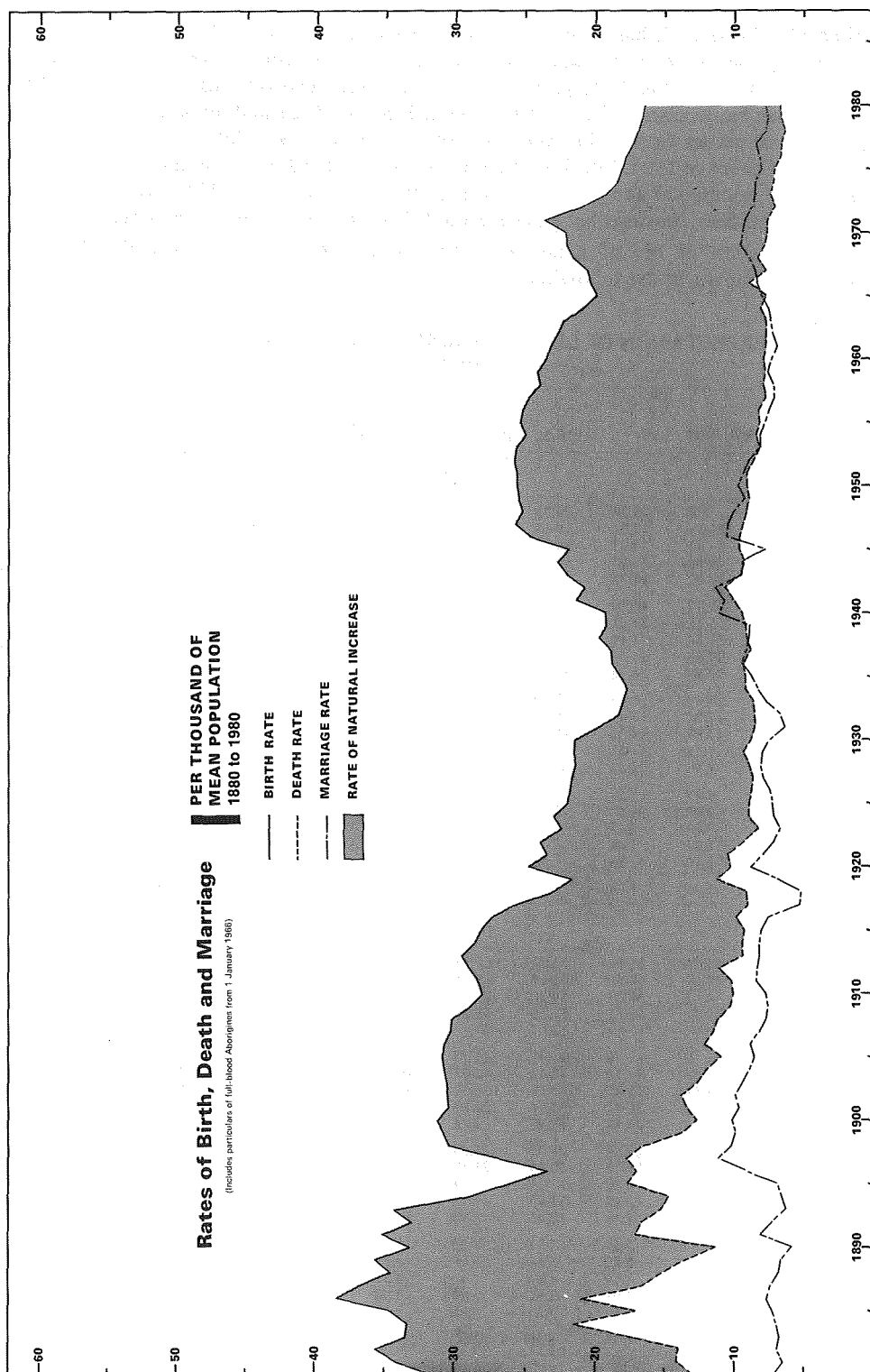
## FEMALES

Under 1	18.8	8.6	7.9	5.1	(b) 19.4	(b) 17.7	(b) 16.6	(b) 11.4
1-4					1.2	0.8	1.0	0.6
5-9	1.3	1.3	0.5	0.5	0.3	0.3	0.3	0.2
10-14	1.2	1.0	0.6	0.3	0.2	0.2	0.2	0.2
15-19	1.3	1.3	0.7	0.7	0.5	0.4	0.6	0.6
20-24	3.1	1.9	1.2	0.7	0.5	0.7	0.6	0.6
25-29	4.0	2.8	1.5	0.8	0.6	0.7	0.5	0.5
30-34	4.6	3.1	1.6	1.0	0.8	0.8	0.8	0.6
35-39	4.9	4.2	2.6	1.5	1.4	1.4	1.4	1.0
40-44	6.4	5.8	3.1	2.1	2.0	2.1	1.8	1.7
45-49	8.1	6.4	5.1	3.6	3.3	3.3	3.2	2.8
50-54	10.6	9.1	6.8	5.9	5.0	5.3	4.7	4.3
55-59	12.8	10.7	10.1	8.6	7.2	7.6	7.5	6.6
60-64	17.8	17.3	16.1	13.9	11.4	12.6	11.5	10.0
65-69	30.5	29.8	24.6	20.7	19.4	20.7	19.4	17.6
70-74	54.2	44.1	40.8	39.2	35.4	34.6	35.7	27.0
75-79	96.4	74.4	74.2	67.7	60.6	57.8	57.9	50.0
80-84	137.1	121.0	117.6	109.7	101.9	100.6	94.8	88.6
85-89	219.5	192.4	187.5	189.9	191.5	182.4	194.7	181.0
90 and over	478.3	397.2	273.8	285.9				

## PERSONS

Under 1	21.4	11.4	8.6	6.1	(b) 21.2	(b) 19.9	(b) 18.7	(b) 12.9
1-4					1.2	1.0	1.1	0.8
5-9	1.8	1.4	0.7	0.6	0.4	0.4	0.4	0.3
10-14	1.3	1.2	0.6	0.4	0.3	0.3	0.3	0.3
15-19	1.9	1.5	1.1	1.2	0.8	0.8	1.0	1.0
20-24	3.5	2.2	1.7	1.4	1.2	1.2	1.2	1.1
25-29	4.0	2.8	1.7	1.4	1.1	1.1	1.0	0.9
30-34	5.0	3.1	1.9	1.4	1.2	1.3	1.2	1.2
35-39	5.7	4.1	2.5	1.8	1.8	1.9	1.8	1.5
40-44	7.2	5.2	3.7	2.7	2.8	2.8	2.4	2.3
45-49	10.4	7.7	5.7	4.8	4.2	4.3	4.4	4.0
50-54	14.6	11.5	9.2	7.6	7.4	7.3	6.6	6.4
55-59	19.6	16.6	13.8	12.3	11.4	12.1	11.1	10.1
60-64	27.9	23.4	21.4	19.3	17.8	19.3	18.3	15.8
65-69	41.7	37.0	32.6	30.9	29.1	30.8	29.9	26.3
70-74	64.3	55.3	50.8	50.4	46.5	47.2	47.7	40.2
75-79	106.7	91.1	86.6	79.8	76.3	74.1	74.0	65.1
80-84	162.6	149.7	133.2	125.9	118.0	118.3	116.3	104.4
85-89	252.0	222.9	204.1	205.8	210.7	203.8	210.2	191.9
90 and over	528.3	389.2	312.3	290.4				

(a) Average annual number of deaths at the specified ages during each three-year period per 1,000 of population in the corresponding age group at the relevant census. Figures for 1960-62 and earlier exclude particulars of full-blood Aborigines; those for 1965-67 and later relate to total population, i.e. including Aborigines. (b) For age *Under 1*, figures for 1960-62 and later represent infant deaths per 1,000 live births registered.



**Australian Life Tables.** It has been the practice at each census from 1911 onwards to prepare Life Tables representative of the mortality experience of Australia. The mortality of the Australian population for the thirty years from 1881 to 1910 inclusive was investigated in 1911 by the Australian Statistician. Tables were compiled for each State and for Australia as a whole in respect of each sex for each of the decennial periods 1881 to 1890, 1891 to 1900, and 1901 to 1910. At the Census of 1921, Life Tables were prepared by the Australian Statistician from the recorded census population and the deaths in the three years 1920 to 1922. Tables based on data derived from later censuses have been compiled by the Commonwealth Actuary.

The expectation of life of males and females at various ages as revealed by these investigations is shown in the following table.

EXPECTATION OF LIFE (a) — AUSTRALIA: 1881-90 TO 1975-77  
(Years)

Age last birthday (years)	1881-90	1891-1900	1901-10	1920-22	1932-34	1946-48	1953-55	1960-62	1965-67	1970-72	1975-77
MALES											
0	47.20	51.08	55.20	59.15	63.48	66.07	67.14	67.92	67.63	67.81	69.56
5	52.86	55.61	57.91	60.43	62.57	63.77	64.32	64.77	64.36	64.52	65.83
10	48.86	51.43	53.53	56.01	58.02	59.04	59.53	59.93	59.50	59.66	60.95
15	44.45	46.98	49.03	51.44	53.36	54.28	54.72	55.07	54.63	54.78	56.06
20	40.58	42.81	44.74	46.99	48.81	49.64	50.10	50.40	49.98	50.19	51.47
25	37.10	38.90	40.60	42.70	44.37	45.04	45.54	45.80	45.40	45.64	46.89
30	33.64	35.11	36.52	38.44	39.90	40.40	40.90	41.12	40.72	40.94	42.18
35	30.06	31.34	32.49	34.20	35.46	35.79	36.25	36.45	36.04	36.23	37.46
40	26.50	27.65	28.56	30.05	31.11	31.23	31.65	31.84	31.44	31.61	32.81
45	23.04	23.99	24.78	26.03	26.87	26.83	27.18	27.38	26.99	27.12	28.32
50	19.74	20.45	21.16	22.20	22.83	22.67	22.92	23.13	22.76	22.87	24.05
55	16.65	17.08	17.67	18.51	19.03	18.84	19.00	19.18	18.83	18.92	20.06
60	13.77	13.99	14.35	15.08	15.57	15.36	15.47	15.60	15.27	15.35	16.40
65	11.06	11.25	11.31	12.01	12.40	12.25	12.33	12.47	12.16	12.21	13.13
70	8.82	8.90	8.67	9.26	9.60	9.55	9.59	9.77	9.52	9.51	10.31
75	6.72	6.70	6.58	6.87	7.19	7.23	7.33	7.47	7.33	7.29	7.91
80	5.11	5.00	4.96	5.00	5.22	5.36	5.47	5.57	5.51	5.52	5.95
85	3.86	3.79	3.65	3.62	3.90	3.84	4.01	4.08	4.07	4.13	4.45
90	2.91	2.91	2.64	2.60	2.99	2.74	2.93	3.02	3.05	3.15	3.45
95	2.16	2.16	1.88	1.86	2.11	1.93	2.10	2.29	2.33	2.60	2.94
100	1.32	1.29	1.18	1.17	1.10	—	—	—	1.82	2.25	2.67
FEMALES											
0	50.84	54.76	58.84	63.31	67.14	70.63	72.75	74.18	74.15	74.49	76.56
5	56.00	58.64	60.80	63.64	65.64	67.91	69.61	70.78	70.64	70.97	72.66
10	51.95	54.46	56.39	59.20	61.02	63.11	64.78	65.92	65.75	66.08	67.75
15	47.54	49.97	51.86	54.55	56.29	58.27	59.90	61.01	60.84	61.17	62.82
20	43.43	45.72	47.52	50.03	51.67	53.47	55.06	56.16	56.00	56.35	57.98
25	39.67	41.69	43.36	45.71	47.19	48.74	50.24	51.32	51.17	51.51	53.12
30	36.13	37.86	39.33	41.48	42.77	44.08	45.43	46.49	46.34	46.67	48.26
35	32.58	34.14	35.37	37.28	38.37	39.46	40.67	41.70	41.56	41.88	43.43
40	29.08	30.49	31.47	33.14	34.04	34.91	36.00	36.99	36.85	37.16	38.67
45	25.56	26.69	27.59	28.99	29.74	30.45	31.44	32.38	32.26	32.55	34.03
50	22.06	22.93	23.69	24.90	25.58	26.14	27.03	27.92	27.83	28.10	29.53
55	18.64	19.29	19.85	20.95	21.58	22.04	22.81	23.63	23.58	23.82	25.19
60	15.39	15.86	16.20	17.17	17.74	18.11	18.78	19.51	19.52	19.74	21.04
65	12.27	12.75	12.88	13.60	14.15	14.44	15.02	15.68	15.70	15.90	17.13
70	9.70	9.89	9.96	10.41	10.98	11.14	11.62	12.19	12.23	12.39	13.52
75	7.24	7.37	7.59	7.73	8.23	8.32	8.69	9.16	9.22	9.36	10.29
80	5.27	5.49	5.73	5.61	6.01	6.02	6.30	6.68	6.72	6.88	7.58
85	3.90	4.12	4.19	4.06	4.30	4.32	4.52	4.79	4.85	5.03	5.49
90	2.98	3.07	2.99	2.91	3.05	3.08	3.24	3.48	3.53	3.73	4.02
95	2.25	2.18	2.10	2.07	2.00	2.14	2.31	2.59	2.66	2.81	3.11
100	1.37	1.23	1.24	1.24	1.02	—	—	—	2.04	2.13	2.72

(a) Figures for years prior to 1965-67 refer to population exclusive of full-blood Aborigines.

## MARRIAGES

The number of marriages registered in Western Australia in each of the six years 1974 to 1979 is shown in the following table. Marriages celebrated by ministers of religion are distinguished from those celebrated by civil officers, and the proportions of the total number of marriages which were celebrated by each category of celebrant are also shown.

## MARRIAGES REGISTERED

Year	Marriages celebrated by —		All marriages	Proportion celebrated by —	
	Ministers of religion	Civil officers		Ministers of religion	Civil officers
1974	7,137	2,158	9,295	76.78	23.22
1975	6,673	2,353	9,026	73.93	26.07
1976	6,316	3,201	9,517	66.37	33.63
1977	5,869	4,194	10,063	58.32	41.68
1978	5,342	4,062	9,404	56.81	43.19
1979	5,052	4,187	9,239	54.68	45.32

The following table gives details of the average age and of the marital status of bridegrooms and brides in each of the six years to 1979.

## AVERAGE AGES OF BRIDEGROOMS AND BRIDES

Year	Average age of bridegrooms (years)				Average age of brides (years)			
	Bachelors	Widowers	Divorced	Total	Spinsters	Widows	Divorced	Total
1974	24.46	56.48	38.31	26.71	21.63	48.96	35.28	23.80
1975	23.96	57.02	37.78	26.52	21.35	49.45	34.68	23.70
1976	24.45	58.40	37.99	27.75	21.66	50.26	34.34	24.83
1977	25.09	57.32	38.40	28.60	22.20	48.83	34.50	25.66
1978	24.79	57.82	37.82	28.26	22.04	52.03	34.02	25.34
1979	24.78	57.03	38.11	28.59	22.20	50.69	34.40	25.68

**Marriage Rates.** The average annual marriage rates per thousand of mean population for Western Australia and for Australia in each five-year period from 1946 to 1975, as well as the rates for each of the years from 1974 to 1979, are shown in the following table.

MARRIAGE RATES (a)  
WESTERN AUSTRALIA AND AUSTRALIA

Period	Average annual rate		Year	Annual rate	
	Western Australia	Australia		Western Australia	Australia
1946-50	10.01	9.77	1974	8.32	8.14
1951-55	8.44	8.29	1975	7.87	7.55
1956-60	7.36	7.50	1976	8.13	7.90
1961-65	7.43	7.63	1977	8.41	7.45
1966-70	8.87	8.81	1978	7.69	7.23
1971-75	8.40	8.36	1979	7.43	7.24

(a) Rates prior to 1966 exclude particulars of full-blood Aborigines. Rates for years prior to 1976 are based on final census results; those for 1976 and later are subject to revision.

**Religious and Civil Marriages.** *The Marriage Act 1961* (Commonwealth) provides that marriages may be celebrated either by ministers of religion registered for the purpose with the Registrar of Ministers of Religion in each State or Territory, by the Registrar-General, his Deputy or other State officers appointed under the Registration of Births, Deaths and Marriages Act (State), or, since 1973, by other persons authorised by the Commonwealth Attorney-General.

The following table, which relates to marriages registered in Western Australia during the period 1974 to 1979, shows the numbers and proportions celebrated by ministers of the principal religious denominations and by civil officers.

## RELIGIOUS AND CIVIL MARRIAGES

Category of authorised celebrant	1974	1975	1976	1977	1978	1979	
						Number	Per cent of total
Ministers of religion —							
Registered ministers of recognised religious denominations (a) —							
Church of England in Australia	2,381	2,159	1,852	1,766	1,608	1,463	15.84
Church of Jesus Christ of the Latter Day Saints	20	21	24	16	34	33	0.36
Churches of Christ in Australia	231	182	206	219	207	194	2.10
Congregational Union of Australia (b)	88	96	98	56	—	—	—
Jehovah's Witnesses	44	57	55	41	47	52	0.56
Jewry	27	11	12	10	7	12	0.13
Lutheran Church	41	46	44	48	35	45	0.49
Orthodox Church (c)	93	97	96	68	78	80	0.86
Roman Catholic Church	2,289	2,165	2,097	1,904	1,771	1,720	18.62
Seventh-day Adventist Church	39	39	44	39	37	40	0.43
The Baptist Union of Australia	141	134	144	166	136	125	1.35
The Methodist Church of Australasia (b)	956	880	827	475	—	—	—
The Presbyterian Church of Australia (b)	481	462	402	243	34	31	0.34
The Salvation Army	60	54	65	74	65	55	0.60
Uniting Church in Australia (b)	—	—	—	532	1,041	983	10.64
Other	150	234	304	183	182	154	1.67
Total	7,041	6,637	6,270	5,840	5,282	4,987	53.98
Other ministers of religion	96	36	46	29	60	65	0.70
Total	7,137	6,673	6,316	5,869	5,342	5,052	54.68
Civil officers —							
Registrar-General, etc.	} (d) 2,158	{ 1,941 412	2,047 1,154	1,656 2,538	1,401 2,661	1,263 2,924	13.67 31.65
Other persons							
Total	2,158	2,353	3,201	4,194	4,062	4,187	45.32
Total marriages	9,295	9,026	9,517	10,063	9,404	9,239	100.00

(a) Under authority of the Marriage Act. (b) The Uniting Church in Australia was formed in June 1977 by the union of all the Methodist Churches and most of the Congregational and Presbyterian Churches. (c) Includes denominations grouped under this heading in the proclamation made under the Marriage Act. (d) Separate details not available.

## DIVORCE

The *Family Law Act* 1975 (Commonwealth), which came into operation on 5 January 1976, repealed the Matrimonial Causes Act and made new provisions relating to divorce. It also established the Family Court of Australia.

In Western Australia, jurisdiction relating to the *Family Law Act* 1975 (Commonwealth) is vested in the Family Court of Western Australia constituted by the *Family Court Act* 1975-1979 (State).

The Family Law Act provides that an application by a party to a marriage for a decree of dissolution of the marriage shall be based on the ground that the marriage has broken down irretrievably. A decree of dissolution is made if, and only if, the Court is satisfied that the parties separated and thereafter lived separately and apart for a continuous period of not less than twelve months immediately preceding the date of the filing of the application for dissolution of marriage, provided that the Court is satisfied that there is no reasonable likelihood of cohabitation being resumed.

The Family Court of Western Australia which commenced operation on 1 June 1976 also exercises jurisdiction in matters concerning the adoption of children, and the guardianship, custody or maintenance of children.

In the following table particulars are given of the duration of marriage, i.e. the interval between marriage and the time of dissolution, for marriages dissolved during the six years 1974 to 1979.

## DISSOLUTIONS OF MARRIAGE — DURATION OF MARRIAGE

Year of dissolution of marriage	Marriages dissolved after a duration of —							Total marriages dissolved
	Under 5 years	5-9 years	10-14 years	15-19 years	20-24 years	25-29 years	30 years and over	
1974	176	561	378	234	176	139	97	1,761
1975	220	699	466	334	255	159	107	2,240
1976	676	1,540	878	622	469	356	277	4,818
1977	642	1,198	772	498	380	271	214	3,975
1978	614	984	656	420	333	201	179	3,387
1979	654	953	637	439	345	205	164	3,397

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# CHAPTER V — SOCIAL CONDITIONS

## Part 1 — Education

### PRIMARY, SECONDARY AND TECHNICAL EDUCATION

In Western Australia, education at primary and secondary levels is provided at government schools administered and staffed by the Education Department and at non-government schools, most of which are conducted by the principal religious bodies. Reference to the Technical Education Division of the Education Department will be found later in this Part.

#### Primary and Secondary School Enrolments

The following tables give a classification according to age of pupils enrolled at government and non-government schools.

#### GOVERNMENT AND NON-GOVERNMENT SCHOOLS PUPILS CLASSIFIED ACCORDING TO AGE (a)

Age last birthday (b)(c) (years)	Government schools (d)						Non-government schools					
	1975	1976	1977	1978	1979	1980	1975	1976	1977	1978	1979	1980
Under 6	7,838	8,504	8,694	8,045	7,462	8,898	1,524	1,493	1,533	1,338	1,343	1,572
6	19,247	19,429	21,337	20,782	19,294	18,408	3,396	3,409	3,524	3,508	3,293	3,360
7	18,506	19,612	19,986	21,655	20,794	19,516	3,216	3,358	3,384	3,566	3,554	3,372
8	18,020	18,694	19,995	20,180	21,708	21,068	3,350	3,196	3,439	3,497	3,693	3,660
9	17,758	18,567	19,121	20,205	20,195	21,585	3,382	3,350	3,298	3,402	3,582	3,790
10	17,921	18,023	18,540	19,119	20,111	20,215	3,442	3,380	3,402	3,413	3,592	3,889
11	18,333	17,969	18,171	18,563	19,051	19,823	3,532	3,569	3,552	3,683	3,591	3,832
12	18,484	17,902	17,754	17,801	17,862	18,048	4,093	4,155	4,113	4,110	4,235	4,396
13	17,800	18,068	17,862	17,170	17,167	17,439	4,554	4,625	4,512	4,601	4,836	4,886
14	17,281	17,568	17,873	17,548	16,970	16,845	4,445	4,544	4,579	4,537	4,525	4,855
15	13,215	13,887	14,228	14,560	14,257	13,476	3,811	4,039	4,065	4,135	4,200	4,118
16	7,181	7,509	7,709	8,074	8,083	7,810	2,865	2,889	3,087	3,117	3,239	3,124
17	3,207	3,526	3,556	3,630	3,715	3,186	1,638	1,669	1,637	1,784	1,769	1,611
18 and over	233	299	282	317	360	317	125	134	132	153	129	130
Total	195,024	199,557	205,108	207,649	207,029	206,634	43,373	43,810	44,257	44,844	45,581	46,595

(a) Excludes children attending pre-school centres and children in pre-school grades at primary schools. (b) At 1 August for 1975 to 1979 and at 1 July for 1980. (c) Children may commence school at the beginning of the year in which they attain the age of 6 years. Except in special circumstances, attendance is compulsory from the age of 6 years and upward to the end of the year in which the child attains the age of 15 years. (d) Includes special schools and classes. Excludes Technical Schools and Colleges. Excludes also part-time students enrolled in the Western Australian Correspondence School.

#### GOVERNMENT AND NON-GOVERNMENT SCHOOLS PUPILS CLASSIFIED ACCORDING TO AGE AND SEX: AT 1 JULY 1980 (a)

Age last birthday (b) (years)	Government schools (c)			Non-government schools			All schools (c)		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Under 6	4,546	4,352	8,898	759	813	1,572	5,305	5,165	10,470
6	9,418	8,990	18,408	1,626	1,734	3,360	11,044	10,724	21,768
7	10,080	9,436	19,516	1,607	1,765	3,372	11,687	11,201	22,888
8	10,910	10,158	21,068	1,813	1,847	3,660	12,723	12,005	24,728
9	11,184	10,401	21,585	1,879	1,911	3,790	13,063	12,312	25,375
10	10,419	9,796	20,215	1,930	1,959	3,889	12,349	11,755	24,104
11	10,301	9,522	19,823	1,880	1,952	3,832	12,181	11,474	23,655
12	9,372	8,676	18,048	2,184	2,212	4,396	11,556	10,888	22,444
13	9,178	8,261	17,439	2,434	2,452	4,886	11,612	10,713	22,325
14	8,779	8,066	16,845	2,354	2,501	4,855	11,133	10,567	21,700
15	6,790	6,686	13,476	1,923	2,195	4,118	8,713	8,881	17,594
16	3,710	4,100	7,810	1,482	1,642	3,124	5,192	5,742	10,934
17	1,577	1,609	3,186	785	826	1,611	2,362	2,435	4,797
18 and over	161	156	317	78	52	130	239	208	447
Total	106,425	100,209	206,634	22,734	23,861	46,595	129,159	124,070	253,229

(a) See footnote (a) to previous table. (b) See footnote (c) to previous table. (c) See footnote (d) to previous table.

School censuses conducted annually at or about the beginning of August prior to 1980 are now held in July in all States and the internal Territories of Australia. The Western Australian Correspondence School, special schools and classes, schools in institutional homes, hospitals and similar establishments, and pre-school centres are included in the census. Institutions such as business colleges and coaching establishments are excluded.

### THE EDUCATION DEPARTMENT

The Education Department is responsible for the organisation and management of the State Government's education programme and is controlled by a Director-General of Education responsible to the Minister for Education. The administrative structure of the Department provides for four Directorates in the administrative area (Administration, Building Services, Finance and Management Services), five Directorates in the professional area (Schools, Educational Services, Staffing, Planning, and Guidance and Special Education) and a Technical Education Division. Special Branches attached to relevant Directorates are concerned with such activities as physical education (including swimming instruction), music, drama, art and crafts, visual education, publications, guidance, library services, curriculum development, planning, buildings, and educational research. In addition there is provision for a number of other services which are concerned with particular aspects of the education and welfare of school children, including the School Medical and Dental Service conducted in collaboration with the Department of Public Health.

The Education Department is developing a policy of regionalisation. For administrative purposes there are four metropolitan and nine country regions. Regional directors interpret and implement broad government and departmental policies within their regions and act as channels of communication between the central administration, the teachers and the community in general.

#### Primary and Secondary Schools

Children may commence school at the beginning of the year in which they attain the age of six years. Except in special circumstances, attendance is compulsory from the age of six years and upward to the end of the year in which the child attains the age of fifteen years. Instruction in the primary school is provided over a seven-year period. A child who makes normal progress completes the course at the age of twelve years and may then enter high school. A Senior High School provides tuition in five years of secondary study leading to the Certificate of Secondary Education. A High School gives instruction in the first three years of the secondary school curriculum culminating in an Achievement Certificate. A District High School is one which provides primary schooling and the first three years of secondary schooling. At some centres where there is no high school, post-primary subjects are taught at the primary school.

The Education Act provides for a Board of Secondary Education to approve courses of study and to certify student achievement in secondary education in Western Australia.

The Achievement Certificate describes the achievement of a student in the first three years of secondary schooling and is issued at the end of Year 10, or earlier if the student leaves school in Years 8 or 9 or before completing Year 10. Each full year's achievement is recorded.

The Certificate of Secondary Education (formerly the Leaving Certificate) is issued to students at the end of Year 12. Certification is based on school assessment moderated by and combined with either a Board-supervised test or the Tertiary Admissions Examination as appropriate to each subject.

#### Primary and Secondary Curriculum

In primary schools the subjects taught are English, mathematics, social studies, science, physical education, handicrafts, music, art and, in some cases, foreign languages. The teaching of science aims at a better understanding of the child's physical environment. The course is adapted to the conditions of the particular neighbourhood, and so varies between town and

country areas. In music expression, choral singing receives most attention, although school orchestras are being developed in some primary and high schools. Advisory teachers working from regional offices, and specialist teachers based in schools, under the direction of the regional superintendents and the specialist superintendent, assist teachers in handicrafts, physical education, art, music, speech, drama and science.

At the post-primary level, every student is required to take, until the completion of Year 10, instruction in English, mathematics, science, and social studies, as well as one or more subjects chosen from a range of optional studies.

Education in government schools is secular in character but periods are set aside during which representatives of various religious denominations may attend to give religious instruction. In addition, instruction in scripture stories is given by class teachers.

The figures shown under the heading 'On special duties' represent teachers engaged in activities associated with the Special Branches of the Department.

### GOVERNMENT SCHOOLS

Particulars	At 1 August —					At 1 July —
	1975	1976	1977	1978	1979	1980
NUMBER OF SCHOOLS						
Primary schools	513	519	524	533	545	560
District high schools	50	52	52	52	53	53
High schools	13	11	11	12	10	9
Senior high schools	53	58	61	62	66	68
Total	629	640	648	659	674	690
NUMBER OF TEACHERS (a)						
Engaged in teaching duties	9,446	9,930	10,372	10,951	11,285	11,422
On special duties	272	341	354	449	520	497
On leave	77	139	115	142	131	97
Total	9,795	10,410	10,841	11,542	11,936	12,016
Males	4,467	4,733	4,981	5,267	5,476	5,505
Females	5,328	5,677	5,860	6,275	6,460	6,511
NUMBER OF PUPILS (b)						
Grade of education —						
Primary	132,204	134,822	139,536	142,184	142,128	141,701
Secondary —						
Years 8, 9 and 10	50,192	51,538	52,017	51,338	50,494	50,058
Years 11 and 12	12,305	12,917	13,309	13,858	14,038	14,239
Ungraded pupils in special classes	323	280	246	269	369	636
Total	195,024	199,557	205,108	207,649	207,029	206,634
Males	101,523	103,816	106,155	107,424	106,974	106,425
Females	93,501	95,741	98,953	100,225	100,055	100,209

(a) Includes persons teaching pre-primary grades. Excludes persons teaching part-time. (b) Excludes part-time students enrolled in the Western Australian Correspondence School.

### Audio-visual Materials, Radio and Television

Extensive use is made of audio-visual technology. Schools are equipped with projectors, tape-recorders, radios, television sets and sound-reproduction systems. Most secondary schools have video-recording equipment and this has also been supplied to remote and other disadvantaged schools. The Audio-Visual Education Branch, which operates through a number of decentralised outlets, supplies a wide variety of learning materials on loan and for purchase. The Branch produces many requisites for use in schools, and also obtains materials from commercial sources. The Australian Broadcasting Commission liaises with the Education Department through the Audio-Visual Branch in providing an extensive range of educational radio and television broadcasts for schools.

### **Student Counselling and Vocational Guidance**

Guidance Officers of the Directorate of Guidance and Special Education counsel pre-children and school-age students and their parents where the children are experiencing emotional/social problems or learning difficulties, and give career guidance to secondary school students.

In district high schools teachers have been appointed as Careers Advisers to provide career services to country students.

The Department also employs nurses and social workers to provide additional assistance.

### **Special Education**

The Directorate of Guidance and Special Education provides many kinds of assistance to handicapped children. Special schools for physically handicapped, hospitalised, and intellectually handicapped children are also provided. A kindergarten and junior school for deaf children is maintained as well as a school for older pupils. A Rural Children's Special Education Unit has been formed to provide special education to rural and isolated children. The Department co-operates with the Crippled Children's Society, the Spastic Welfare Association, the Slow Learning Children's Group and other agencies in providing support for special education programmes.

### **Distance Education**

The Distance Education Centre was formed in 1981 as the result of the amalgamation of the Western Australian Correspondence School and the Isolated Students Matriculation Scheme. It also includes the Isolated Family Correspondence Scheme which supports pre-primary education in the home. The service covers the kindergarten to Year 12 curriculum and supports students who cannot receive an education in the traditional classroom because of isolation, itinerant parents or for social and medical reasons.

The five Schools of the Air located at Carnarvon, Derby, Kalgoorlie, Meekatharra and Port Hedland maintain a close liaison with the Distance Education Centre and use prepared correspondence material to support the broadcast lessons.

Where required, support will be given by the Distance Education Centre to small rural primary and secondary schools where special needs have been identified.

An expanding feature of the service offered by the Distance Education Centre is the field support given to students by visiting tutors and teaching staff. Associated with this service are the itinerant teachers who are based at the Schools of the Air.

Every opportunity is taken to provide isolated students with the opportunity of attending major or mini camps to afford some compensation for the lack of social interaction found in the normal classroom situation. Seminars are also conducted annually to support home-based supervisors.

### **Education of Aborigines**

Children of Aboriginal descent are enrolled in government schools and are offered, as far as is practical, an education similar to that of other children. In schools where a significant proportion of the enrolment is Aboriginal, attention may be directed towards the framing of specific, modified courses. These may be of a special nature or take the form of an alternative programme equal in academic status to the standard course.

In addition, vocationally-orientated programmes for older students, the production of learning materials, the provision of supplementary funding and advisory assistance are implemented through the Department's Regional Offices in liaison with the Aboriginal Education Branch of the Department.

The Branch offers assistance in the education of all Aboriginal children. A pre-primary section for Aboriginal children is administered by the Early Childhood Branch in liaison with the

Aboriginal Education Branch. In March 1980 there were 10,322 children of Aboriginal descent at government primary and secondary schools, and 1,748 at non-government schools.

Instruction for adult Aborigines is available under the Adult Aboriginal Education programme conducted by the Technical Education Division.

### **Agricultural Education**

Agricultural education is provided at a number of government schools. Full-time residential courses in agriculture are available at the Narrogin Agricultural College, the Harvey Agricultural Senior High School and the Cunderdin and Denmark Agricultural District High Schools. The two-year curriculum is designed as a continuation of general education to standards equivalent to those of other types of schools. Vocational agriculture subjects are studied under the auspices of the Board of Secondary Education towards the Certificate of Secondary Education. The aim is to produce people capable of becoming leaders in rural communities as well as being successful farmers with an appreciation of the value of scientific methods in agriculture. To be eligible for selection, students must have successfully completed Year 10 and gained a satisfactory report from their previous school concerning their participation in various school activities. Although some preference is given to students who can demonstrate likely ownership-access to farming land, this is not essential. The 32-bed dormitory at the Cunderdin School has been designed to accommodate both male and female students.

While the schools at Cunderdin, Denmark and Harvey are administered in conjunction with their associated high schools, Narrogin Agricultural College was made autonomous in 1981 and offers short courses for farmers in addition to its other courses.

Residential accommodation for students taking courses in agriculture is also available at Morawa District High School and the special agricultural school at Gnowangerup.

Day instruction in agricultural subjects is provided at Central Midlands, Cyril Jackson, Esperance, Governor Stirling, Kelmscott, Manjimup, Merredin, Narrogin, Mt Barker, Northam and Wanneroo Senior High Schools, and at the District High Schools of Boyup Brook, Corrigin, Dalwallinu, Darkan, Goomalling, Kellerberrin, Kojonup, Margaret River, Morawa, Narembeen, Pingelly, Wyalkatchem, York and at the town wing of the Denmark School. In Years 9 and 10 Agriculture is taught as an optional subject within the Achievement Certificate and in Years 11 and 12 as the unit Agricultural Studies accredited for the Certificate of Secondary Education.

Most schools providing agricultural instruction have agricultural land attached to them. Advisory committees appointed by the Minister in these schools offer advice concerning management and development of the land.

Diploma and certificate courses in various aspects of agriculture are provided by the Technical Education Division at Albany, Bunbury, Fremantle and Geraldton Technical Colleges by means of class tuition, or by correspondence through the Technical Extension Service.

In addition to the activities of the Education Department in the field of agricultural education, some private schools offer courses in agriculture.

### **Technical Education**

The Technical Education Division of the Education Department offers technician-level courses, apprenticeship and pre-apprenticeship training, general studies programmes (including courses for students preparing for public and other external examinations), and adult education (including classes designed as leisure-type studies).

The Technical Education Division provides instruction in ten 'areas of study', namely Agriculture; Apprenticeships and Post-apprenticeship Courses; Art; Building and Architecture; Engineering (including Aeronautical and Marine); General and Social Studies; Health and Psychology; Catering, Management and Fashion Design; Management, Business and

Commercial Studies; and Mathematics and Science. The Division has also become closely associated with industry in training mature age persons who have, through advancing and changing technology, become redundant in their chosen field.

Institutions under the control of the Technical Education Division at 31 December 1980 comprised seventeen technical colleges (Albany, Balga, Bentley, Bunbury, Carine, Carlisle, Claremont, Eastern Goldfields, Fremantle, Geraldton, Leederville, Midland, Mount Lawley, Perth, Rockingham, Thornlie and Wembley) and the Technical Extension Service, eight evening technical schools with full-time officers in charge, 120 technical and other centres including Adult Aboriginal Education Centres. The Division has a Counselling Service which is available to advise students in selecting a course, to assist them in their studies, and to provide consultant services to industry and commerce on staff selection and training.

Against a background of rapid technological change, considerable resource and industrial development and increasing specialisation within and between industries, the Technical Education Division is currently developing a more active and innovative approach to meeting the vocational education and manpower training needs of industry. In addition to the more traditional approach of revising existing formal award courses or introducing new courses in response to changing needs, the Division has:

- (a) expanded the provision of short intensive vocational courses specifically directed at particular industry needs,
- (b) expanded the provision of education options in the transition from school to work programmes for the 15-19 years age group,
- (c) introduced new concepts in teaching and course design,
- (d) established new experimental, non-institutional training projects,
- (e) adopted a new non-institutional approach to the provision of vocational education and training in remote country areas as is currently being piloted at Wagin, the geographic centre of the Great Southern Region, and
- (f) initiated the current establishment of mobile resource units (which can be moved from area to area at short notice) in the fields of science, engineering and woolclassing thus overcoming difficulties of providing remote areas with sophisticated industrial training equipment.

#### TECHNICAL EDUCATION

Particulars	1975	1976	1977	1978	1979	1980
COLLEGES (a)						
Number of —						
Colleges (b)	6	14	14	15	15	18
Teaching positions (c) —						
Full-time	615	936	1,038	1,133	1,193	1,228
Part-time	1,219	1,985	2,122	2,113	2,071	2,169
Student enrolments	40,572	61,209	62,020	63,429	65,296	72,695
SCHOOLS (d)						
Number of —						
Schools (b)	8	—	10	11	11	8
Teaching positions (c) —						
Full-time	244	—	16	11	12	9
Part-time	740	—	762	821	833	681
Student enrolments	20,046	—	22,886	25,709	24,119	21,455
CENTRES						
Number of —						
Centres (b)	92	101	90	91	92	85
Teaching positions (c) —						
Full-time	23	21	12	5	5	5
Part-time	1,390	1,512	1,005	1,054	990	902
Student enrolments	30,130	36,066	20,275	18,402	19,433	15,379

TECHNICAL EDUCATION — *continued*

Particulars	1975	1976	1977	1978	1979	1980
OTHER SERVICES (e)						
Number of —						
Services (b)	3	3	3	3	3	3
Teaching positions (c) —						
Full-time	36	41	30	37	37	51
Part-time	256	282	196	275	279	308
Student enrolments	3,324	3,352	3,730	4,989	4,737	2,884
TOTAL						
Number of —						
Colleges, schools, centres, and other services (b)	109	118	117	120	121	114
Teaching positions (c) —						
Full-time	918	998	1,096	1,186	1,247	1,293
Part-time	3,605	3,779	4,085	4,263	4,173	4,060
Total	4,523	4,777	5,181	5,449	5,420	5,353
Student enrolments —						
Males	50,922	51,728	53,820	54,156	55,293	55,221
Females	43,150	48,899	55,091	58,373	58,292	57,192
Total	94,072	100,627	108,911	112,529	113,585	112,413

(a) Includes Technical Extension Service. See also footnote (d). (b) At 31 December. (c) At 1 July. A teacher may occupy teaching positions at more than one institution; the number of individual teachers is not available. (d) In 1976 all technical schools were renamed colleges; however, in 1977 certain technical centres were renamed Evening Technical Schools. (e) Adult Aboriginal Education Centres, Counselling Service, and teachers in administrative positions. Excludes Youth Education Classes.

The Technical Extension Service, through its correspondence courses, caters for a wide range of instruction for students who are unable to attend formal classes because of remoteness or individual limitations such as physical disability.

The Technical Education Division collaborates with two Commonwealth Government authorities, the Department of Immigration and Ethnic Affairs and the Department of Education, in providing courses in the English language for adult migrants. The Division conducts an Adult Aboriginal Education programme which, although designed mainly to develop literacy, also conducts classes in community obligations, home skills, employment skills and leisure-time activities.

## PRE-SCHOOL EDUCATION

Pre-primary and pre-school centres are established by the Education Department and by local groups respectively. Attendance is optional at all centres. A year of free voluntary pre-primary education for children of the age of five years is being progressively introduced into the government education system.

The *Education Act 1928-1979*, requires that every person conducting a pre-school centre shall hold a permit issued by the Minister for Education and that every authorised pre-school centre shall be subject to inspection by an officer of the Education Department.

The Early Childhood Branch of the Department is responsible for the co-ordination of early childhood services, the overall administration of pre-primary centres attached to government primary schools and for maintaining staff and advisory services to pre-school centres which are controlled by local parent committees.

## PRE-SCHOOL CENTRES

Particulars	At 1 August —		At 1 July —
	1978	1979	1980
Number of centres —			
Pre-primary	291	355	395
Pre-school	261	255	205
Independent pre-schools	20	41	49
Non-government schools	19	(a)	(a)
Total	591	651	649
Number of staff —			
Trained teachers	673	634	675
Trained aides, assistants	154	169	158
Untrained assistants	667	676	701
Total	1,494	1,479	1,534
Number of children —			
Pre-primary centres	10,182	13,239	14,186
Pre-school centres	13,504	10,971	9,678
Independent pre-schools	1,442	1,604	1,708
Non-government schools	139	..	..
Total	25,267	25,814	25,572

(a) Registered as separate independent pre-schools.

## NON-GOVERNMENT SCHOOLS

The non-government schools, which are conducted mainly by religious organisations, provide education from pre-school level to the end of the secondary school course, equivalent to the final year in the government high schools. The curriculum at the primary and secondary levels is substantially the same as that in the government schools.

## Schools, Teachers and Pupils

## NON-GOVERNMENT PRIMARY AND SECONDARY SCHOOLS

Particulars	At 1 August —					At 1 July —
	1975	1976	1977	1978	1979	1980
NUMBER OF SCHOOLS						
Denomination of school —						
Church of England	10	10	10	9	9	9
Methodist	3	3	(a)	(a)	(a)	(a)
Presbyterian	2	2	(a)	(a)	(a)	(a)
Roman Catholic	156	149	146	144	147	147
Uniting Church	—	—	5	5	5	5
Other denominations	9	9	10	10	12	13
Non-denominational	11	14	17	19	23	24
Total	191	187	188	187	196	198
NUMBER OF TEACHERS (b)						
Denomination of school —						
Church of England	269	264	275	283	301	311
Methodist	126	137	(a)	(a)	(a)	(a)
Presbyterian	103	102	(a)	(a)	(a)	(a)
Roman Catholic	1,326	1,409	1,494	1,553	1,618	1,677
Uniting Church	—	—	243	257	265	269
Other denominations	47	50	53	53	66	67
Non-denominational	45	55	62	68	75	87
Total	1,916	2,017	2,127	2,214	2,325	2,411



NON-GOVERNMENT PRIMARY AND SECONDARY SCHOOLS — *continued*

Particulars	At 1 August —					At 1 July —
	1975	1976	1977	1978	1979	1980
NUMBER OF PUPILS						
Denomination of school —						
Church of England	4,231	4,231	4,183	4,196	4,376	4,589
Methodist	2,130	2,157	(a)	(a)	(a)	(a)
Presbyterian	1,507	1,561	(a)	(a)	(a)	(a)
Roman Catholic	33,609	33,691	33,997	34,339	34,553	35,294
Uniting Church	—	—	3,791	3,926	4,091	4,197
Other denominations	1,087	1,120	1,114	1,173	1,215	1,205
Non-denominational	809	1,050	1,172	1,210	1,346	1,370
Total	43,373	43,810	44,257	44,844	45,581	46,655
Grade of education —						
Primary	24,788	24,678	24,851	25,104	25,395	25,915
Secondary — Years 8, 9 and 10	13,222	13,538	13,721	13,930	14,182	14,574
Years 11 and 12	5,363	5,594	5,685	5,810	6,004	6,166
Total	43,373	43,810	44,257	44,844	45,581	46,655
Males	20,824	21,005	21,328	21,633	22,084	22,762
Females	22,549	22,805	22,929	23,211	23,497	23,893

(a) From June 1977 the Methodist and Presbyterian schools combined with the Uniting Church. (b) Excluding persons on leave without pay and persons teaching part-time.

## POST-SECONDARY EDUCATION

Post-secondary education in Western Australia is provided through the two Universities (Murdoch University and the University of Western Australia), The Western Australian Institute of Technology, the Colleges established under the *Colleges Act 1978-1980* and the technical colleges and centres of the Education Department.

## THE WESTERN AUSTRALIAN POST-SECONDARY EDUCATION COMMISSION

The Western Australian Post-Secondary Education Commission was established under the terms of the *Western Australian Post-Secondary Education Act 1970-1979*, to advise the Government, post-secondary education institutions and the Commonwealth Tertiary Education Commission on the planning, co-ordination, development and financing of post-secondary education. Specific matters on which the Commission provides advice include establishment and location of new post-secondary education institutions; acquisition and reservation of sites; levels of financial support requested by the institutions; assessment of proposals for the introduction of new courses of study; accreditation of new and existing courses; salaries and other conditions of employment of academic and non-academic staff of the institutions; and criteria for entrance to the institutions.

The Commission consists of a Chairman and eleven other members appointed by the Governor on the recommendation of the Minister for Education. The Chairman is appointed for a term not exceeding seven years, and the other members for terms not exceeding four years. At least three, but not more than four, of these members are to be members of staff, whether academic or otherwise, of a post-secondary education institution.

## THE TERTIARY INSTITUTIONS SERVICE CENTRE

The Tertiary Institutions Service Centre was set up in 1975 by agreement between the tertiary institutions for the purpose of: (a) conducting the Tertiary Admissions Examination in accordance with the policy laid down by the Tertiary Admission Examination Committee; (b) processing applications for admission to the institutions; and (c) carrying out such other functions as agreed by the institutions. Under the terms of the agreement a management committee comprising representatives of the tertiary institutions is responsible for the activities of the Centre.

The Tertiary Admissions Examination Committee comprises members nominated by the Education Department, tertiary education institutions and non-government schools. In conjunction with the Board of Secondary Education the Committee has established a Joint Syllabus Committee for each subject of the examination. These committees are responsible for considering and making recommendations relating to all syllabus matters.

An examining panel, usually of three members is responsible for the setting and marking of papers and for advising on matters concerning examination format and procedures.

Results from the Tertiary Admissions Examination are used in selecting students for admission to a tertiary institution. The results also form a component of the grades shown on the Certificate of Secondary Education which is issued by the Board of Secondary Education.

Applicants seeking admission to a first year undergraduate course (or later years in the case of Murdoch University) or to a Diploma in Education course apply through a joint system operated by the Centre. Applicants list four preferences from all the tertiary courses available and offers are then made by the institutions for each course on the basis of a ranked order.

### THE COLLEGES

Multi-level post-secondary education colleges may be established by the Minister for Education, on the advice of the Western Australian Post-Secondary Education Commission, under the provisions of the *Colleges Act 1978-1980*. Such colleges may, with the Minister's approval, provide advanced education, technical and further education, and education at other levels in specified circumstances.

A number of Colleges have been established in the metropolitan and country areas. In the metropolitan area, these include Churchlands College, Claremont Teachers College, Mount Lawley College and Nedlands College. These Colleges all provide teacher education courses, and have introduced substantial developments in other selected fields of study. Hedland College and Karratha College are situated in the Pilbara region in the north-west of the State. Both commenced operations in temporary facilities in 1980, while the planning and construction of new buildings were undertaken. They provide courses in the technical and further education sector but in future may provide higher education for local students in co-operation with institutions based in the Perth metropolitan area. Hedland and Karratha Colleges also provide a focus for educational and cultural activities within their respective communities.

In November 1980 the State Government announced that a self-governing college would be established at Kalgoorlie, incorporating the Western Australian School of Mines Branch of the Western Australian Institute of Technology and the Eastern Goldfields Technical College of the Education Department of Western Australia. The new college has been named the Western Australian School of Mines and Further Education. An Interim Council has been appointed to manage the affairs of the new institution, and it will take over full teaching and administrative responsibilities for the new college from 1 January 1982.

#### Churchlands College

Churchlands College was established in 1972 and offers courses in Business Studies and in Teacher Education. The following courses were available in 1981:

Graduate Diploma	Mathematics Education (Primary), Music Education (Primary), Remedial Education, Science Education (Primary), Finance, and Management Studies.
Bachelor's Degree	Business (Accounting, Administration, Financial Management Economics, Information Management and Information Processing), Education (Early Childhood, Primary).
Diploma	Teaching (Early Childhood, Primary).

In April 1981 there were 2,747 students enrolled of whom 1,192 were in the Business Studies course and 1,555 in the Teacher Education course.

### Claremont Teachers College

Claremont Teachers College was established in 1902 as the State's first teachers college. In recent years it has been able to diversify and in 1981 it offered the following courses:

Graduate Diploma	Education (Primary), Reading Education, Speech and Drama Education, Religious Education and Career Education
Bachelor's Degree	Education (Primary)
Diploma	Teaching (Primary), Teaching (Conversion)
Associate Diploma	Health Education

There were 1,400 students enrolled in full-time, part-time and external courses in 1981.

### Mount Lawley College

Mount Lawley College was established in 1970 and in 1981 offered the following courses:

Graduate Diploma	Art Education, Educational Technology, Intercultural Studies (Aboriginal Studies, Ethnic Studies, Migrant Studies), Language Studies (Language Arts, Modern Language Education, Teaching English as a Second Language), Physical Education, Special Education
Bachelor's Degree	Education
Diploma	Teaching (Primary), Music Teaching, Performance (Music), Dance Studies (Teaching), Dance Studies (Performance)
Associate Diploma	Applied Arts and Sciences

The number of enrolments in full-time and part-time courses at April 1981 was 2,156.

### Nedlands College

The College was established in 1967 as the Western Australian Secondary Teachers College to train future secondary-school teachers. It became the Nedlands College from January 1979 in accordance with the *Colleges Act 1978*. In 1981 the College offered the following courses:

Graduate Diploma	Education (Secondary), Recreation, Secretarial Studies
Bachelor's Degree	Education (Secondary), Applied Science (Recreation)
Diploma	Applied Science (Recreation), Teaching (Secondary)
Associate Diploma	Library Media, Recreation

Some students enrolled at the College earn academic credit through approved studies undertaken at other tertiary institutions. The total number of enrolments at the College in 1981 was 2,211.

### Hedland College

Hedland College was established in 1980 to offer courses in Apprentice and Post Trade studies, other fields in Technical and Further Education (TAFE) and to provide local assistance to students studying advanced education.

The following College course was offered in 1981:

Certificate Office and Secretarial Studies.

Also in 1981 the College acted as agent in Port Hedland in providing tuition towards the Computer Methods unit of The Western Australian Institute of Technology and the following TAFE awards:

Certificate	Accounting, Art Studies, Commercial Studies, Engineering (various), Industrial Electronics, Welding (various)
Diploma	Accounting, Art Studies, Commercial Studies, Personnel Management, Public Administration
Other	Licence — Department of Labour and Industry Riggers, Licence — S.E.C. 'A' Grade, Membership Institute of Mechanical Engineers

In 1980 there were 1,826 students enrolled, of whom 1,686 were at Port Hedland and 140 at the Newman Centre.

### Karratha College

Karratha College was established in 1980 and work is proceeding on the construction of its campus buildings. The following courses were offered in 1981.

TAFE Certificate	Accounting, Art Studies, Commercial Practice, Engineering Drafting, Supervision, Training
TAFE Diploma	Accounting, Business Administration, Engineering
Apprenticeship	Automotive Mechanics, Electrical Trades

The College also provides counselling and tutorial assistance to external students in university and advanced education programmes. In 1980, there were 1,039 students enrolled at the College.

### THE WESTERN AUSTRALIAN INSTITUTE OF TECHNOLOGY

The Western Australian Institute of Technology is a college of advanced education, established in terms of the *Western Australian Institute of Technology Act 1966-1977* as an autonomous body under the control of a governing council. The main functions of the Institute, as set out in the Act, are to provide facilities for higher specialised instruction and to advance training in the various branches of technology and science; to aid the advancement, development and practical application to industry of science or any techniques; and to encourage and provide facilities for the development and improvement of tertiary education whether on a full or part-time basis to meet the needs of the community.

Buildings for the Institute were commenced in 1963 on a site of about 109 hectares at Bentley, approximately eleven kilometres from the Perth city centre, and the initial group of buildings was officially opened on 17 August 1966. The administration and associated buildings were officially opened on 11 October 1968.

### Finance

#### THE WESTERN AUSTRALIAN INSTITUTE OF TECHNOLOGY — FINANCE (a) (\$'000)

Particulars	1974	1975	1976	1977	1978	1979
INCOME						
Income for specific capital purposes (b) —						
Commonwealth Government grants	5,888	6,815	1,924	3,680	3,761	1,444
State Government grants	13	460	—	—	—	—
Total	5,901	7,275	1,924	3,680	3,761	1,444
Income for other purposes —						
Commonwealth Government grants	16,920	24,029	26,719	29,195	30,321	32,912
State Government grants	87	105	—	—	—	—
Donations and endowments	14	11	26	128	29	107
Other	1,319	1,542	1,247	1,810	3,849	7,388
Total	18,340	25,687	27,992	31,133	34,199	40,407
TOTAL INCOME	24,241	32,962	29,916	34,813	37,960	41,851
EXPENDITURE						
Salaries and wages	11,589	16,504	18,228	20,892	22,623	24,144
Library	266	479	320	451	507	564
Buildings, grounds and equipment	6,678	6,617	1,937	3,673	4,317	2,429
Minor equipment	958	799	973	1,438	820	(c)
Sundry auxiliary expenditure	4,410	6,453	7,413	8,673	9,980	14,961
TOTAL EXPENDITURE	23,901	30,852	28,871	35,127	38,247	42,098

(a) The Commonwealth Government assumed full financial responsibility for tertiary education with effect from 1 January 1974 and tuition fees were abolished. State Government grants shown for 1974 and 1975 represent amounts outstanding from previous years or grants made for specific purposes such as research.

(b) Income received specifically for new buildings, major alterations and additions to buildings, installation of services, purchase of land and buildings and major equipment. (c) From 1979 included with Buildings, grounds and equipment.

## Courses

The Institute conducts regular courses leading to an associate diploma, diploma, bachelor's degree, graduate diploma or master's degree qualification. The courses vary in duration according to the level and may be undertaken by full-time or part-time studies. It is also possible to study some courses on an external (correspondence) basis. The normal entrance requirement for undergraduate courses is that a student shall have attained an aggregate of scaled marks exceeding a determined minimum in the Tertiary Admissions Examination. The aggregate is calculated on the basis of scaled marks gained in five subjects, one of which must be English or English Literature. Other avenues for admission include selection on the basis of school assessment, certain qualifications obtained through the Technical Education Division, or other qualifications equivalent to Tertiary Admission Examination standards. Special provisions exist by means of a Mature Age Scheme for admitting those over the age of twenty-one years who do not meet the normal entrance requirements.

The teaching work of the institute is organised under four Divisions namely Arts, Education and Social Sciences; Business and Administration; Engineering and Science; and Health Services.

The Institute offered degrees for the first time in 1973 and it currently offers degrees in most areas of study. A range of graduate diploma programmes, and masters' degrees are currently on offer in the Business, Chemistry, Education, Engineering, English, Health, Sciences, Library Studies, Metallurgy, Physics, Pharmacy, Planning, Science Education, and Surveying and Mapping disciplines.

## School of Mines of Western Australia

The School of Mines of Western Australia was established at Coolgardie in 1902 and was transferred to Kalgoorlie in the following year. Control of the School of Mines, formerly part of the Department of Mines, passed to The Western Australian Institute of Technology in January 1969 and formed the nucleus of the School of Mining and Mineral Technology established in 1975. Towards the end of 1980, the State Government decided that the School of Mines and the Eastern Goldfields Technical College would be amalgamated into a single institution. The new institution, which will be known as the Western Australian School of Mines and Further Education, will be established under the *Colleges Act 1978-1980*. An Interim Council for the college was appointed late in 1980; however, in 1981 The Western Australian Institute of Technology continued to be responsible for the academic work in the advanced education sector while the Technical Education Division of the Education Department remained responsible for the technical and further education programme.

Undergraduate courses are available in Accounting, Engineering (Civil, Electrical, Mechanical, Mining), Metallurgy (extractive), Mine Surveying, Mine Ventilation and Mining Geology. These courses extend over three or four years of full-time study or the part-time equivalent. An associate diploma course in Mining and Mineral Technology extending over two years of full-time study or the part-time equivalent, is also provided. The total number of students enrolled in 1980 was 271 and 287 in 1981.

Through the Kalgoorlie Metallurgical Laboratory, the School undertakes metallurgical investigations as well as assays for gold or for other metals. Free assays and mineral determinations are made available for *bona fide* prospectors.

The School has a geological museum which is open to the public and contains rocks and minerals from many parts of Australia and elsewhere.

## Muresk Agricultural College

Muresk Agricultural College, situated about thirteen kilometres south of Northam in the Avon Valley, was established by the Department of Agriculture in 1926. Control of the College was transferred to The Western Australian Institute of Technology from the Department of Agriculture in January 1969.

The College offers three tertiary level courses. There are two Associate Diploma courses, one in Agriculture and the other in Equine Stud Management. Both are of two years' duration and fully residential. The third course is a full-time bachelor degree programme of three and a half years' duration. These courses are designed to give a sound scientific, technical and managerial training suitable for those wishing to become farm owners or managers, or to work in industries servicing agriculture. The subjects studied are Plant Sciences and Husbandry, Animal Sciences and Husbandry, Agricultural Engineering, Farm Management, Soil Science, Humanities and Practical Farm Work. Instruction is given by means of lectures, assignments, laboratory and workshop practical work, demonstrations, tutorials, day tours to farms and research stations, extended tours into the agricultural areas, and practical farming on the College estate and on a nearby project farm.

The estate of some 900 hectares is devoted to mixed farming and provides the students with an opportunity to gain a considerable amount of practical experience by observation, demonstration and actual participation in a wide variety of farming activities. Use is made of the College facilities for various research projects.

Numerous short courses are held at the College, including in-service training schools for personnel of the Department of Agriculture and for field and service staff of agricultural firms.

The number of students enrolled at the College in 1980 was 244.

### Teachers, Students, and Courses Completed

The following table gives particulars of teaching staff in each of the years 1975 to 1980. The number of students taking and completing courses is also shown.

#### THE WESTERN AUSTRALIAN INSTITUTE OF TECHNOLOGY

Particulars	1975	1976	1977	1978	1979	1980
NUMBER OF TEACHING STAFF (a)						
Full-time —						
School and department heads	35	37	36	38	42	41
Senior lecturers	122	129	122	143	145	142
Lecturers	258	278	295	273	264	267
Assistant lecturers, tutors, demonstrators, etc.	59	88	81	100	93	104
Total, Full-time	474	532	534	554	544	554
Part-time (b)	115	139	115	98	125	147
NUMBER OF STUDENTS IN APPROVED COURSES (a)						
Full-time	4,290	4,775	4,776	4,921	4,978	5,024
Part-time —						
Internal	4,251	4,983	5,093	5,022	5,115	5,140
External	1,079	1,086	1,217	1,252	1,282	1,333
Total	9,620	10,844	11,086	11,195	11,375	11,497
Males	6,565	7,126	7,139	7,012	6,983	6,909
Females	3,055	3,718	3,947	4,183	4,392	4,588
NUMBER OF STUDENTS WHO COMPLETED COURSES						
Field of study —						
Agriculture	15	33	30	35	26	35
Applied science	79	94	104	127	r103	133
Art and design	72	80	73	85	87	112
Building, surveying, architecture	83	54	121	138	123	138
Commercial and business studies	352	342	346	370	r391	442
Engineering and technology	149	142	123	176	r253	124
Liberal studies	236	335	339	338	r360	410
Para-medical	173	217	253	322	r321	344
Teacher education	105	146	229	273	262	300
Total	1,264	1,443	1,618	1,864	r1,926	2,038

(a) At 30 April. (b) Expressed on the basis of full-time staff equivalents.

## THE UNIVERSITY OF WESTERN AUSTRALIA

University education first became available in Western Australia in 1898, with the formation of the Extension Committee of the University of Adelaide by which facilities were provided for external studies in courses for degrees in Arts and Science. The first step towards the establishment of a university in Western Australia was taken in 1904, when a University Endowment Act providing for the incorporation of a trust to administer funds for the purpose was passed by the State Parliament. Following a favourable report made by a Royal Commission under the chairmanship of Dr (later Sir Winthrop) J. W. Hackett, the University was established by the University of Western Australia Act of 1911. Teaching began in 1913 in subjects related to the Faculties of Arts, Science and Engineering. Additional Faculties established since that time are those of Law (1927), Agriculture (1936), Dental Science (1946), Education (1947), Economics (1954), Medicine (1956) and Architecture (1966). The Faculty of Economics was reconstituted as the Faculty of Economics and Commerce in 1961.

### Matriculation Requirements

A candidate for matriculation is required to take subjects at the Tertiary Admissions Examinations selected in accordance with the Matriculation Regulations, and to obtain an aggregate of marks not less than a minimum determined by the University. The marks included in the aggregate of a full-time student must have been obtained in a single year, while those included in the aggregate of a part-time student must have been obtained during a period of not more than three consecutive years.

Matriculant status may be granted to an applicant who has satisfied the examination requirements of another university in Australia, New Zealand or the United Kingdom, or of any other university recognised by The University of Western Australia, qualifying him for matriculation.

The regulations also provide that a person over the age of twenty-one years who has not qualified for matriculation may be admitted provisionally to a degree course if he is able to demonstrate that, by reason of his education, aptitude or intelligence, there is a reasonable prospect of his being able to assimilate and benefit from the course. Some faculties use the University's Mature Age Examination (which consists of English or English Literature and one other approved subject in the Tertiary Admissions Examination), while other faculties accept other evidence.

### Degrees

Degrees are granted in the Faculties of Agriculture, Architecture, Arts, Dental Science, Economics and Commerce, Education, Engineering, Law, Medicine and Science.

Courses for the pass degrees of Bachelor of Arts, Bachelor of Economics, Bachelor of Commerce, Bachelor of Physical Education and Bachelor of Science extend over a period of not less than three years; pass and honours courses for the degrees of Bachelor of Music, Bachelor of Music Education, Bachelor of Education, Bachelor of Engineering and Bachelor of Science in Agriculture over not less than four years; and that for the degree of Bachelor of Architecture, over not less than five years. The course for the degree of Bachelor of Dental Science extends over not less than four years after successful completion of one year's study, including certain compulsory units, in another faculty; the course for the degree of Bachelor of Jurisprudence extends over a period of not less than three years, following successful completion of the first year of a course in any other faculty and that for the degree of Bachelor of Laws over a period of not less than one further year. Honours degree courses in Arts, Commerce, Economics, Education, Music, Physical Education and Science are usually of four years' duration. The course in the Faculty of Medicine for the degrees of Bachelor of Medicine and Bachelor of Surgery extends over six years. The medical and dental courses may be interrupted to permit selected students to take a one-year course for the honours degree of Bachelor of Medical Science or Bachelor of Science in Dentistry respectively. The course for the degree of Bachelor of

Psychology occupies not less than one year after completion of three years of a course for the degree of Bachelor of Arts or Bachelor of Science. The course for the postgraduate degree of Bachelor of Social Work extends over a period of not less than two years after successful completion of a first degree course.

Other degrees conferred by the University are those of Master of Arts and Doctor of Letters, Master of Music, Master of Music Education and Doctor of Music, Master of Psychology, Master of Laws and Doctor of Laws, Master of Education, Master of Physical Education, Master of Economics, Master of Commerce, Master of Business Administration, Master of Industrial Relations, Master of Japanese Studies, Master of Science and Doctor of Science, Master of Science Education, Master of Engineering Science, Master of Engineering and Doctor of Engineering, Master of Science in Agriculture and Doctor of Science in Agriculture, Master of Science in Natural Resource Management, Master of Dental Science and Doctor of Dental Science, Master of Surgery and Doctor of Medicine, Master of Architecture, Master of Building Science and Master of Social Work. The degree of Doctor of Philosophy is given for research in all faculties.

### **Diploma Course**

In addition to the above degree courses, a postgraduate Diploma in Education course is available.

### **University Government**

The original Act provided that the Senate and Convocation should constitute the governing authority with power to make statutes for 'the management, good government and discipline of the University'.

The Senate consists of twenty-five members, of whom six are appointed by the Governor, six are elected by Convocation, four are elected by the full-time teaching staff, two are elected by students, three are *ex officio* members (the Vice-Chancellor of the University, the Director-General of Education or his appointee and the President of the Guild of Undergraduates), and four are co-opted members. Convocation consists of graduates of the University and such other persons as are eligible for membership under the provisions of the University of Western Australia Act.

Since an amendment to the Act in 1944 the Senate alone has been the governing authority and is responsible, subject to the Act and the statutes, for the entire control and management of the University. Statutes approved by the Senate are submitted to Convocation for its consideration, and although Convocation may suggest amendments the Senate is not bound to accept them. The Act requires that statutes shall be submitted to the Governor for approval, after which they have the force of law.

The Chancellor is the titular head of the University. He is elected annually by the Senate from among its members and presides over its meetings. The Vice-Chancellor is the chief executive officer of the University and is appointed by the Senate for a period not exceeding ten years, at the end of which term he is eligible for reappointment. At meetings of Convocation the chairman is the Warden who is elected annually by Convocation from among its members.

The Guild of Undergraduates is constituted under the Act as a voluntary association of the University students 'for furthering of their common interests, and shall be the recognised means of communication between the students and the governing authority of the University'. The government of the student body is vested in the Guild Council, to which members are elected in accordance with regulations made by the Guild.

### **Student Fees, Allowances and Scholarships**

The Royal Commission appointed to inquire into the establishment of a University recommended that teaching should be free and suggested that 'if fees are found to be necessary, they should be on the lowest possible scale'. This policy was adopted and tuition fees were not



charged, except in the case of a limited number of students, until 1962 when fees were introduced to assist in meeting the increasing costs of operation resulting from a rapidly growing student enrolment and to enable the University to take full advantage of financial aid available under Commonwealth legislation. The Commonwealth Government assumed full financial responsibility for tertiary education with effect from 1 January 1974 and tuition fees were abolished. However, all students of the University must pay an annual amenities and services fee.

Financial assistance is given to students by the Commonwealth Government under the Tertiary Education Assistance Scheme and by means of postgraduate awards, to which reference is made later in this Part. In addition, the University makes awards, from its own funds, of research studentships for postgraduate study which are competed for by students holding no other award and having an Honours degree of second class (Division A), or higher, standard. Graduates may also apply for Hackett Studentships for overseas study which, in addition to other financial benefits, carry a travel grant. Some large private industrial concerns also make annual awards for study at postgraduate level.

### Finance

The following table relates to the income and expenditure of The University of Western Australia in each year from 1974 to 1979.

THE UNIVERSITY OF WESTERN AUSTRALIA — FINANCE (a)  
(\$'000)

Particulars	1974	1975	1976	1977	1978	1979
<b>INCOME</b>						
Income for specific capital purposes (b) —						
Commonwealth Government grants	1,770	2,694	775	775	652	117
State Government grants	704	672	(c) —13	—	—	—
Total	2,474	3,366	762	775	652	117
Income for other purposes —						
Commonwealth Government grants	23,586	28,287	32,285	35,900	38,515	41,564
State Government grants	272	469	209	690	518	521
Donations and endowments	1,483	1,695	2,066	2,517	2,817	3,851
Student fees (d)	28	27	28	28	30	28
Other	1,924	2,424	2,959	3,813	4,241	3,888
Total	27,293	32,902	37,547	42,948	46,121	49,852
<b>TOTAL INCOME</b>	<b>29,767</b>	<b>36,268</b>	<b>38,309</b>	<b>43,723</b>	<b>46,773</b>	<b>49,969</b>
<b>EXPENDITURE</b>						
Teaching and research	17,655	23,117	25,942	29,284	31,974	34,410
Administration and general overhead	2,619	3,585	3,862	4,131	4,511	4,669
Libraries	1,686	2,305	2,355	2,636	2,817	3,086
Buildings, premises, grounds	5,281	6,880	4,447	4,069	3,751	4,127
Sundry auxiliary expenditure	1,059	1,279	1,568	1,781	2,097	2,072
<b>TOTAL EXPENDITURE</b>	<b>28,300</b>	<b>37,166</b>	<b>38,174</b>	<b>41,901</b>	<b>45,150</b>	<b>48,364</b>

(a) The Commonwealth Government assumed full financial responsibility for tertiary education and abolished student fees with effect from 1 January 1974. State Government grants and student fees shown since 1974 represent grants made for specific purposes such as research and charges incurred by students such as late enrolment fees. (b) Income received specifically for new buildings, major alterations and additions to buildings, installation of services, purchase of land and buildings and major equipment. (c) Unexpended funds returned. (d) See also footnote (a).

### Colleges and Hall of Residence

There are five residential colleges within the University. Four of the colleges take both men and women students; these are Kingswood and St Columba Colleges, both conducted by the Uniting Church of Australia, St Thomas More College, a foundation of the Roman Catholic Church and St George's College which is conducted by the Anglican Church. St Catherine's College is a non-denominational college for women students.

Currie Hall is a non-denominational hall of residence for men and women students.

## Tuition

In addition to the normal lectures and tutorials for full-time students, courses for part-time students are offered in the Faculties of Arts, Education, Economics and Commerce, and Science. Certain subjects may be taken at institutions affiliated with the University. These are the Colleges of Advanced Education at Churchlands, Claremont, Mount Lawley and Nedlands.

## Staff, Students and Students Completing Courses

The following table gives particulars of teaching staff and students in each of the years from 1975 to 1980. The number of students taking and completing courses during each of these years is also shown. Further information is available from the publications *University Statistics: Part 1 — Students* (Catalogue No. 4208.0) and *Part 2 — Staff and Libraries* (Catalogue No. 4209.0), which are issued annually by the Australian Statistician, Canberra.

### THE UNIVERSITY OF WESTERN AUSTRALIA

Particulars	1975	1976	1977	1978	1979	1980
NUMBER OF STAFF (a)						
Teaching —						
Full-time —						
Professors	60	67	74	72	72	76
Associate professors, readers	67	64	70	72	73	80
Senior lecturers	185	194	189	199	196	198
Lecturers, teaching registrars	150	160	170	170	166	146
Senior tutors and demonstrators, assistant lecturers	96	108	100	108	97	90
Demonstrators, tutors, teaching fellows	50	41	36	33	33	18
Total	608	634	639	654	637	608
Part-time (b) —						
Lecturing	11	12	11	10	11	11
Tutoring/demonstrating	79	88	80	83	74	75
Total (b)	90	100	91	94	86	86
Research —						
Full-time	31	76	99	98	105	122
Part-time (b)	—	—	—	—	—	—
Other —						
Full-time	1,441	1,420	1,412	1,428	1,398	1,376
Part-time (b)	100	95	27	62	83	76
NUMBER OF STUDENTS (a)						
Internal —						
Full-time	6,279	6,364	6,640	6,597	6,528	6,548
Part-time	3,444	3,403	3,167	3,118	3,079	3,191
External	353	37	58	41	32	52
Total	10,076	9,804	9,865	9,756	9,639	9,791
Males	6,493	6,256	6,184	6,020	5,885	5,858
Females	3,583	3,548	3,681	3,736	3,754	3,933
NUMBER OF STUDENTS WHO COMPLETED COURSES (c) r						
Field of study —						
Agriculture, forestry	28	27	15	38	28	31
Architecture, building	11	21	14	9	24	14
Dentistry	18	18	27	22	23	25
Economics, commerce, government	233	245	300	286	268	259
Education	325	374	336	352	300	289
Engineering, technology	130	121	103	112	112	106
Fine arts	12	11	10	11	16	13
Humanities	231	286	256	240	265	291
Law	74	140	186	176	170	182
Medicine	118	137	128	123	134	164
Natural sciences	307	277	250	288	253	303
Social and behavioural sciences	200	208	230	275	315	310
Total	1,687	1,865	1,855	1,932	1,908	1,987

(a) At 30 April. (b) Figures for part-time staff have been converted to a full-time equivalent on the basis of 250 hours per annum for lecturers, 700 hours per annum for tutors and demonstrators and 35 hours per week for all other staff. (c) Year ended 30 June.

### Research

More than \$6.1 million was spent on research at the University during 1980. This sum comprised funds provided by the Commonwealth Government through the Tertiary Education Commission, grants from agencies such as the Australian Research Grants Committee and the National Health and Medical Research Council, and bequests and benefactions from private industry and members of the public. Of the total figure, over \$1.7 million was applied to general support of research activities and \$4.4 million to particular research projects financed by outside agencies. Salaries of staff engaged in research and the overheads involved are not included in these figures.

For the most part the research undertaken is 'pure' research, that is, research aimed simply at deepening and broadening man's knowledge of himself and his world: this is a fundamental and normal activity of a university which can very often lead to significant practical applications.

### Extension Service

The Adult Education and Extension Committee was established by the Senate of the University in 1968 as a result of the reorganisation of the former Adult Education Board which had been created by the University in 1928. In 1972 the Committee was renamed the Extension Committee and more emphasis is now placed on University extension activities. The policies of the Committee are implemented by the Director of the Extension Service. The headquarters of the organisation are at the University.

The Extension Service is responsible for general courses for adults at university level, for postgraduate and refresher courses and for certain cultural activities. It works in close liaison with university departments and faculties and with professional organisations in the community. The Extension Service also conducts conferences, symposia, seminars and residential schools.

Classes are conducted at the University, and various other activities are arranged in both the metropolitan and country areas. These are generally non-vocational in character. An annual Summer School is also held at the University.

## MURDOCH UNIVERSITY

Murdoch University is established under the provisions of the *Murdoch University Act 1973-1980*, which came into operation on 1 July 1973. The University is named in honour of the distinguished Australian essayist and biographer, Sir Walter Murdoch (1874-1970), foundation Professor of English at The University of Western Australia (1912-1939) and later Chancellor (1943-1948). A ceremony to mark the inauguration of the University was held on 17 September 1974, the centenary of his birth.

**Admissions.** The first nineteen postgraduate students were accepted in 1974 and some 600 undergraduate and forty postgraduate students were accepted in 1975. The University has a flexible policy concerning admissions. In determining the eligibility of a prospective student, consideration is given to examination results, information obtained from school reports, the results of selection tests and interviews with applicants. However, in some courses, particularly in the physical and biological sciences and in mathematics, some prior knowledge of certain subjects is considered necessary.

**Schools of Study.** The University is organised on the basis of schools of study which have both academic and administrative responsibilities. The following schools have been established: Education; Environmental and Life Sciences; Human Communication; Mathematical and Physical Sciences; Social Inquiry; and Veterinary Studies.

**Programmes of Study.** Degree programmes offered in 1981 were in Applied Veterinary Medicine, Biology, Chemistry, Chinese Studies, Communication Studies, Economics, Environmental Science, General Studies, History, Mathematics, Mineral Science (Extractive Metallurgy), Physics, Population and World Resources, Psychology, Social and Political Theory, South-east Asian Studies, Teacher Education, Veterinary Biology, and Comparative Literature.

Undergraduates proceeding to a degree must participate in one of three 'trunk' courses: Australian Studies; Structure, Thought and Reality; Energy and Life Systems. In addition to a trunk course, students are given the opportunity to explore areas outside their specific interests. Students are not required to settle the selection of their degree programmes until the end of their first year.

**Awards.** Studies in appropriate programmes will lead to pass or honours degrees in Arts, Education, Psychology, Science, and Veterinary Medicine and Surgery.

The higher degrees offered by the University are the research degrees of Master of Philosophy and Doctor of Philosophy. Course-work masters' degrees are offered in Applied Psychology, Education and Environmental Science.

Courses for the degree of bachelor are of the following duration: for the ordinary degree of Bachelor of Arts or Bachelor of Science three years, and for the corresponding honours degree four years; for Bachelor of Education and Bachelor of Psychology four years; and for Bachelor of Education (Honours) and Bachelor of Veterinary Medicine and Surgery five years.

The University also offers three one-year diploma programmes for graduates, one in Mineral Science and two in Education.

**External Studies.** Special provision has been made for external students, and a substantial and innovative programme of external studies has been developed. External tuition is the responsibility of staff of the schools of study, but the external studies programme as a whole is co-ordinated by a Director of External Studies.

Beginning in 1975 with a small pilot scheme, Murdoch University in 1976 assumed full administrative responsibility for all university external studies in Western Australia. The external studies programmes are equally available to residents in the Perth metropolitan area and to those living outside Perth including interstate and overseas.

**Research.** In addition to moneys from the University's recurrent budget, finance for research amounting to more than \$700,000 was received in 1980 from various government authorities and private organisations. Current research projects include solar energy; the solvation of ions aimed at use in the processing of minerals; solar energy; storage batteries; trace element nutrition of the Western Australian sand plain flora; the regulation of the development of mammalian embryos prior to implantation; marine biology; reproductive biology; anxiety in high school students; neurological research; and investigation of old people at risk. The Australian Research Grants Committee has provided more than \$225,000 for research in the physical sciences, chemical sciences, biological sciences, veterinary studies and social inquiry during 1981. The National Health and Medical Research Council and the Educational Research Development Committee have also provided substantial grants for 1980-81.

The Mineral Chemistry Research Unit at Murdoch University, established in 1974, received further grants from the Government of Western Australia to permit the continuance of research into minerals processing and other fields of chemistry. The University has received substantial funding for solar energy research from both State and Federal sources. The Unit has attracted more than \$100,000 in outside research funds in each of the last three years.

**University Government.** The governing body of the University is the Senate. It consists of twenty-five members, comprising the Chancellor, the Vice-Chancellor, the Director General of Education or his deputy, the President of the Students' Guild, four members of the academic

staff, one member of the non-academic staff, two students elected by the students, six members appointed by the Governor, two persons who are not Members of Parliament nominated by the Premier and the Leader of the Opposition, three persons elected by Convocation, and three co-opted members. Under the Murdoch University Act the Senate has established an Academic Council, its principal functions being 'the discussion and submission to the Senate of opinions and recommendations on academic policy, academic development, the admission of students, instruction, studies and examinations, research, the admission to degrees, the discipline of the University and any other matters which in the opinion of the Academic Council are relevant to the objects of this Act'.

**Development of Site.** The University site comprises 230 hectares of undulating land south of the Swan River about thirteen kilometres from the Perth city centre and eight kilometres from Fremantle. An area of approximately 175 hectares was formerly part of the Somerville Pine Plantation and was given to Murdoch University by the University of Western Australia.

The major buildings erected during the first triennium were the first stage of the Veterinary School and four main buildings which are grouped around an open court in an elevated position in the northern part of the site. These buildings comprise the Library and Lecture Block, the East Academic Building (physical sciences), the West Academic I Building (humanities), and the Student and Staff Amenities Building. The West Academic II Building (Education, Human Communication, and University Administration), Environmental Sciences, Biological Sciences and the second stage of the Veterinary School (including clinic and hospital) have since been added. Squash courts, senate chambers and bank facilities were completed during 1981. Eight hectares are grassed for playing fields in the south-west part of the site, thirty-two hectares in the south-east are developed as a veterinary farm and holding area, and five hectares are reserved as a native fauna research unit.

#### EXPENDITURE ON EDUCATION BY STATE AND LOCAL AUTHORITIES

State and local authorities comprise the State government, statutory authorities, boards, commissions and corporations, and incorporated bodies in which the State government or its agencies have a controlling interest (other than financial enterprises) together with municipal governments constituted under local government legislation.

STATE AND LOCAL AUTHORITIES (a): OUTLAY ON EDUCATION (b)  
(\$'000)

Item	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Transportation of students (c)	6,580	8,124	9,701	10,966	11,899	13,909
Primary and secondary education —						
Current	133,827	173,430	210,994	236,734	266,322	302,763
Capital	32,489	33,724	29,983	44,814	40,421	26,624
University education —						
Current	29,164	33,926	42,122	48,191	50,263	55,127
Capital	7,753	5,112	9,834	7,675	5,195	3,016
Vocational and other higher education —						
Current	61,624	76,472	91,679	99,032	107,768	118,525
Capital	10,499	10,782	9,491	9,615	16,286	17,682
Other education programmes —						
Current	5,807	9,116	10,060	8,962	5,675	6,046
Capital	2,485	4,356	1,797	652	407	103
Unallocated (including general administration) —						
Current	7,414	8,316	6,494	11,316	13,536	15,139
Capital	110	144	368	688	890	448
<b>Total</b>	<b>297,752</b>	<b>363,502</b>	<b>422,523</b>	<b>478,645</b>	<b>518,662</b>	<b>559,382</b>
Current	244,416	309,384	371,050	415,201	455,463	511,509
Capital	53,336	54,118	51,473	63,444	63,199	47,873

(a) State authorities comprise State Government departments and instrumentalities. Local authorities refer to municipal governments set up under local government legislation. (b) Includes expenditure from Commonwealth Government Grants for education. (c) For current purposes.

### Financial Assistance for Schools and Students

The State Government provides financial aid to non-government schools by means of a direct annual grant in respect of each pupil enrolled. The value of the grant is 26 per cent of an amount estimated to be the average cost of educating a pupil in government schools, less the assessed value of goods and services supplied or paid for by the Minister for Education in relation to a pupil. Separate rates apply to primary and secondary schools.

Subsidies are provided to non-government schools for the installation of swimming pools, and assistance is given by way of reimbursement of interest paid, up to a prescribed maximum rate, on moneys borrowed for expenditure on new residential accommodation, classrooms and associated facilities, school site acquisition and teacher accommodation north of the 26th Parallel.

At the beginning of the 1976 school year, the State Government introduced a living-away-from-home allowance to supplement the isolated children's allowance paid by the Commonwealth Government. The allowance of up to \$250 per annum ensures a combined minimum payment of \$750 per annum for a child who is obliged to live away from home to attend school.

Text books are issued free of charge to primary school children. An annual text book subsidy of \$10 is paid in respect of each student in Years 8 to 10, \$35 in Year 11 and \$20 in Year 12.

All these forms of assistance to students are granted without the application of a means test.

School Book Assistance is available to indigent parents who have children in Years 8 to 10. This scheme aims to assist parents who are unable to meet the cost of their children's books. Parents of students receiving assistance under this scheme are not eligible for the text book subsidy.

### COMMONWEALTH GOVERNMENT ASSISTANCE FOR EDUCATION

Although education is primarily the responsibility of the States, the Commonwealth Government also provides moneys for the financing of educational institutions and the assistance of students.

#### Finance for Institutions

#### COMMONWEALTH GOVERNMENT ASSISTANCE FOR EDUCATION WESTERN AUSTRALIA (\$'000)

Nature of assistance	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Assistance of a revenue nature —						
Universities	27,978	32,891	40,794	46,532	48,318	53,190
Colleges of advanced education (a)	32,359	36,522	46,242	48,080	49,560	53,290
Technical education	2,168	3,322	r 3,607	4,521	5,160	4,780
Schools	17,184	23,194	r 33,520	35,293	38,741	44,019
School-to-work transition	—	—	—	—	—	482
Child migrant education (b)	229	233	2	41	140	125
Aboriginal education	1,582	1,979	2,035	2,184	r 1,996	2,047
Pre-schools and child care	2,328	4,579	5,287	6,247	6,379	6,484
Educational research	33	59	70	75	74	111
Total	83,859	102,779	131,557	142,973	r 150,368	164,528
Assistance of a capital nature —						
Universities	7,714	5,094	9,822	7,664	5,185	3,006
Colleges of advanced education (a)	7,281	7,344	5,074	5,198	5,863	3,044
Technical education	587	2,876	3,690	2,993	3,726	10,481
Schools	15,789	10,565	6,999	16,713	20,971	11,011
Child migrant education (b)	89	(c) —9	—	—	—	—
Aboriginal education	799	25	119	61	159	23
Pre-schools and child care	2,280	1,877	481	197	218	176
Total	34,539	27,771	26,185	32,826	36,122	27,741
GRAND TOTAL	118,398	130,550	157,742	175,799	r 186,490	192,269

(a) Including teachers colleges. (b) From January 1976 administered by the Schools Commission. (c) Amount allocated but subsequently returned.

Grants to the States for education began with contributions towards the recurrent expenditures of universities in 1951-52. Some account of the legislation authorising payment of grants by the Commonwealth Government appears in *Western Australian Year Book*, No. 12 — 1973 (pages 182-4) and earlier issues. In December 1973 the Schools Commission was established by the *Schools Commission Act* 1973 to administer programmes of assistance to primary and secondary schools in the States and Territories. The *Tertiary Education Commission Act* 1977 established the Tertiary Education Commission as a replacement for three former Commissions — the Universities Commission, the Commission on Advanced Education and the Technical and Further Education Commission — to administer the programmes of assistance for tertiary education throughout Australia. Further information on these Commissions and the programmes of assistance can be found in the Budget Paper *Payments to or for the States, the Northern Territory and Local Government Authorities* published by the Commonwealth Government.

An offer by the Commonwealth Government to assume full financial responsibility for tertiary education from 1 January 1974 was accepted by the States at the Premiers' Conference in June 1973. (At the same time it was agreed that appropriate offsets would be made in the general purpose funds provided by the Commonwealth Government to the States.)

Until December 1973, the Commonwealth Government continued to make grants to the States for universities, colleges of advanced education, teachers colleges and pre-school teachers colleges on the basis of the existing 'matching' arrangements with the States. These arrangements provided for grants for recurrent expenditure to be made by the Commonwealth Government on the basis of \$1 for each \$1.85 of State grants and student fees combined. Grants for capital expenditure were made on a \$1 for \$1 basis with moneys spent by the States for this purpose.

The inclusion of teachers colleges and pre-school teachers colleges in the arrangements for other tertiary institutions resulted from a decision that assistance would be provided to these colleges from 1 July 1973 on the same basis as to universities and colleges of advanced education. Previously, assistance had been granted for teachers colleges and pre-school teachers colleges under the States Grants (Teachers Colleges) Acts of 1967 and 1970 and the *States Grants (Pre-School Teacher Colleges) Act* 1968. Grants under these Acts were provided to the States for construction work and equipping of teachers colleges and to expand the capacity of pre-school teachers colleges. Grants for teachers colleges under these arrangements ceased on 30 June 1973 and those for pre-school teachers colleges at the end of 1973.

### **Assistance for Students**

As part of the arrangements whereby the Commonwealth Government assumed full financial responsibility for tertiary education, tuition and related fees in universities, colleges of advanced education, teachers colleges and technical colleges were abolished.

**Tertiary Education Assistance Scheme.** A system of tertiary allowances authorised in terms of the *Student Assistance Act* 1973 came into operation at the beginning of 1974. Under this scheme full-time Australian students enrolled in an approved course at a university, college of advanced education, teachers college, technical college or agricultural college and some non-government institutions may apply for a living allowance subject to a means test. Dependants' allowances are also payable. Students who qualify for the payment of a living allowance are entitled to two other types of benefit, an incidentals allowance and a fares allowance.

**Aboriginal Study Grants Scheme.** The Aboriginal Study Grants Scheme provides assistance on a full-time or part-time basis to Aboriginal students who have left school and are undertaking further education such as business college courses, courses in creative arts and culture, and courses in domestic crafts, as well as more formal tertiary and post-secondary courses. Allowances for dependants, text books and equipment, travel, clothing and other

items are also payable. Part-time students receive an allowance to help meet expenses associated with their course and for those students who undertake their courses by correspondence, assistance with travel and accommodation costs at residential schools is also provided. For both full-time and part-time students, all compulsory fees are met.

**Aboriginal Overseas Study Awards Scheme.** The Aboriginal Overseas Study Awards Scheme was introduced in 1975 to enable leaders or potential leaders of the Aboriginal community who already have considerable experience in their occupational or professional fields to add to their skills and experience by means of short-term programmes of study, observation and discussion overseas. Allowances payable include: travelling allowance, fares allowance, equipment allowance and additional allowances if the award holder's normal income is discontinued.

**Postgraduate Awards.** Holders of Postgraduate Awards are paid allowances to assist them to study for higher degrees at universities or colleges of advanced education. Dependants' allowances and establishment allowances may also be payable.

**Secondary Education.** The Secondary Allowances Scheme assists families with limited financial resources to maintain children at school for the final two years of secondary education. Benefits are subject to a means test.

The Adult Secondary Education Assistance Scheme provides benefits comparable to those available under the Tertiary Education Assistance Scheme to adult students undertaking full-time studies in the final year of secondary schooling.

**Aboriginal Secondary Grants Scheme.** The Aboriginal Secondary Grants Scheme provides financial assistance to encourage Aboriginal children to remain at school for as long as they can benefit from it. The Scheme includes all Aboriginal children attending secondary schools and classes, as well as those attending primary school who are aged fourteen years or over. Benefits include a living allowance or assistance with boarding costs, a contribution towards fees and expenditure on books, uniforms and other school-related expenses, and a personal allowance paid to students.

**Migrant Children.** The Commonwealth Government provides funds for migrant and multicultural education to government and non-government school authorities in the States under the relevant States Grants (Schools) Acts through the Schools Commission's Programs. Funds may be used for a broad range of activities related to teaching English as a second language, including the payment of salaries to special teachers, advisers and ethnic teacher-aides. In 1980 funds were also made available specifically for a Multicultural Education Program which emphasises the teaching of community languages in schools. A contingency programme has also been established for refugee children to assist their successful transition into established school programmes.

**Soldiers' Children Education Scheme.** The *Repatriation Act* 1920 provides assistance for the education and training of children of ex-servicemen who have died as a result of war service, or are either totally and permanently incapacitated or blind. The allowances paid cover expenditure on fees, books, equipment, fares and other items.

**Assistance for Isolated Children Scheme.** This scheme of allowances was introduced to assist in the education of children who, because of their geographic isolation, are without reasonable daily access to a government school providing courses at the appropriate level. Benefits payable in respect of children living away from home to attend school comprise: boarding allowances (partly subject to means test) and, in cases of particular hardship, a special supplementary allowance. For isolated children who study at home by correspondence there is an allowance free of means test. Assistance is also made available where a family, in preference to boarding the children away from home, sets up a second home to enable the children to attend school on a daily basis.



## Chapter V—continued

### Part 2 — Arts, Sciences and Recreation

#### PUBLIC LIBRARIES

##### The Library Board of Western Australia

The Library Board of Western Australia is constituted under the provisions of the *Library Board of Western Australia Act 1951-1974*. It was set up as an independent statutory authority in 1952.

The Board consists of twelve members. The Director-General of Education is an *ex officio* member. The remaining eleven members are appointed by the Governor, five being nominated by the Minister and the other six selected by the Minister. Of these six members, one represents the Library Association of Australia, Western Australian Branch, and the other five represent local government interests throughout the State.

The Board's main responsibilities are to advise the Minister and local authorities on matters of general policy relating to libraries and to administer the funds made available by Parliament for the State library and information service.

#### THE LIBRARY BOARD OF WESTERN AUSTRALIA

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
<b>Expenditure —</b>						
Salaries and wages	\$ 1,125,315	1,423,862	1,672,991	1,967,960	2,296,842	2,765,304
Books, periodicals and binding	\$ 855,223	1,181,408	1,630,825	1,791,413	2,104,601	2,356,378
Other	\$ 189,042	223,248	287,000	376,406	496,446	(a) 649,208
<b>Total</b>	<b>\$ 2,169,580</b>	<b>2,828,518</b>	<b>3,590,816</b>	<b>4,135,779</b>	<b>4,897,889</b>	<b>5,770,890</b>
<b>Number of —</b>						
<b>Full-time staff (b) —</b>						
Qualified librarians	49	51	57	62	72	78
Student librarians and cadets	15	16	17	15	12	9
Other	115	126	134	139	140	148
<b>Total</b>	<b>179</b>	<b>193</b>	<b>208</b>	<b>216</b>	<b>224</b>	<b>235</b>
<b>Associated public libraries (b) —</b>						
Perth Statistical Division	37	38	39	41	43	47
Other statistical divisions	113	114	120	124	125	137
<b>Total</b>	<b>150</b>	<b>152</b>	<b>159</b>	<b>165</b>	<b>168</b>	<b>184</b>
<b>Books —</b>						
Reference and Central Music Library stock —						
Bound volumes (b)	286,124	293,450	(c) 302,357	(c) 311,258	323,015	336,398
Periodical and serial titles received	8,772	9,145	9,634	10,288	11,053	(d) 8,307
Music scores	15,816	16,951	17,576	18,508	19,776	21,191
Circulation library stock —						
Books processed for circulation	160,090	159,781	194,212	209,472	204,557	230,932
Net additions to stock	71,077	62,846	95,416	86,714	55,266	98,166
Stock (b)	1,000,193	1,063,039	1,158,416	1,244,269	1,299,535	1,397,701
Received and dispatched in the exchange programme with local libraries	431,430	469,930	502,878	554,156	566,774	608,230
Inter-library requests received	78,982	82,478	85,559	93,452	97,672	101,510

(a) Includes microfilming and ancillaries expenditure previously included with *Books, periodicals and binding*. (b) At 30 June. (c) Includes government legal deposit publications not previously reported. (d) Decrease is a result of excluding inactive serials.

The State library service comprises: The State Reference Library of Western Australia which includes the Central Music Library; the J. S. Battye Library of West Australian History including the State Archives; the State Bibliographical Centre; the State Film Centre; and local public libraries throughout the State. These units are co-ordinated by the Board to provide an integrated and comprehensive library and information service throughout the State.

### **The State Reference Library of Western Australia**

The origins of the State Reference Library date from 1886 when the Government resolved to establish a library to mark the Golden Jubilee of Queen Victoria. In 1911 this library became the Public Library of Western Australia and is now The State Reference Library of Western Australia.

The State Reference Library differs from other libraries in that its function is not principally to supply books but to provide information in answer to inquiries. It handles over a hundred serious or research inquiries per day, and for this purpose is divided into specialised subject units, each of which has staff experienced in the subject matter concerned.

The *Commerce and Technology Division* provides the business and industrial community, and the tradesman and handyman with the latest technical information and also makes available older material of research value and general works intended for the non-specialist. It comprises the Library of Business, Science and Technology and the Business Information Centre. The Centre provides immediate answers to quick reference questions, mainly in the commercial field. It has telephone directories, business directories, financial services, newspapers and similar material from many parts of the world.

The *Humanities Division* covers a wide field in the arts and social sciences, and includes comprehensive sets of the official publications of the Commonwealth Government, State Governments, and selected overseas governments. The Division caters for the personal needs of the individual seeking information and for the needs of organisations and other bodies concerned with, for example, social welfare, industrial relations and public administration. Economics, politics, law, statistics, education, sociology, history and geography are some of the major areas well represented in the social sciences collection. In the humanities, the collection of works about art and artists is significant and material dealing with other aspects of the fine arts such as architecture, sculpture, furniture, porcelain and china is also held.

**The Central Music Library.** This is the principal music library of the State. It offers a full reference service in the field of music, and scores are available on loan.

The State Reference Library is equipped with microfilm, microfiche, photocopy and tape-recording apparatus. Photocopies of material are available to the extent permitted by the *Copyright Act 1968* (Commonwealth), on payment of an appropriate fee.

In addition to providing reference facilities in the metropolitan area, the service of the library extends throughout the State, through the agency of local public libraries.

### **The J. S. Battye Library of West Australian History**

This Library covers all aspects of the history and development of Western Australia. It has a very large collection of historical documents and papers, including the State Archives (see below). It also records and holds oral history tapes and is responsible for the State Film Archives which is a collection of cinematograph film and associated material relating to Western Australia. The library has the latest information on State developments. It receives the Government Gazette of Western Australia on the day of issue, all Royal Commission and similar reports on the day that they are tabled in Parliament, proposed amendments to town planning schemes as soon as they are issued, and all current Western Australian publications received under copyright. Environmental Impact Statements are obtained immediately on release.

**The State Archives.** Under legislation passed in 1974 the Board has responsibility for the control and custody of all State archives. These include the records not only of the Government but also of all local authorities and all other bodies established under statute. So long as they are in current use they remain the responsibility of the department or body concerned, but when they cease to be in current use they become the responsibility of the Board and their destruction is prohibited without the approval of the Board.

### **The State Bibliographical Centre**

The function of the State Bibliographical Centre is to encourage and facilitate co-operation between all libraries in Western Australia, so that the total resources in the State may be made available to all library users.

The Centre operates the Request and Information Service provided by the Board for all public libraries, organises inter-library loans for, or between, any other approved libraries in the State or elsewhere, and offers bibliographical assistance to any library and to users of the State Reference Library. For these purposes it is equipped with catalogues of the whole stock of the Library Board and with union catalogues of both monographs and journals in over 200 other libraries ranging from those of the University of Western Australia to highly specialised collections held by private concerns or government departments. It also has a large range of published bibliographies from many parts of the world. The Centre is connected by telex to all major libraries of the world.

### **The State Film Centre**

The State Film Centre was transferred from the Education Department to become the responsibility of the Library Board in July 1978. It holds a lending collection of cinematograph film of general interest.

### **Local Public Libraries**

The books in all public libraries in the State are supplied by the Board and remain its property. The Board's policy is to supply books on a minimum basis of 1.25 volumes per head of the population served by the library concerned. At least one-quarter of the books in each library are withdrawn each year and replaced by a corresponding number of fresh volumes.

Any non-fiction book in the State-wide stock is available at any public library if requested by a reader. A printed subject catalogue of the stock is supplied free to every library each year. In the metropolitan area the Board provides a delivery van service to libraries.

Prior to despatch, all books supplied to public libraries are fully catalogued and prepared for use by the Board, which also maintains central stock and location records.

As far as possible, selection of books for each library is carried out by the local librarian but the Board's staff makes the selection for those libraries which are unable to do so.

The Board is not responsible for the provision of local premises nor the employment of local staff, which are provided by the local authority concerned. However, professional advice on library design is available to architects and local authorities.

Of the 138 local authorities in Western Australia, all but one have established one or more public libraries.

## **THE WESTERN AUSTRALIAN MUSEUM**

The Western Australian Museum has developed from two earlier collections. One of these, the museum of the Swan River Mechanics' Institute, was founded by public subscription in 1860, and the other, the Geological Museum at Fremantle, was started in 1881. In 1889 the contents of the Geological Museum were moved to the former Perth Gaol and a Curator was appointed in 1891. In the following year the museum of the Swan River Mechanics' Institute was purchased, and the collections combined to form the Public Museum which, in 1897, became known as the Western Australian Museum. The former Perth Gaol is still part of the Western Australian Museum; it has been renovated, and was re-opened to the public for display purposes in December 1976.

Under the provisions of the *Museum Act 1969-1973*, The Western Australian Museum is governed by seven Trustees appointed by the Governor. The staff is grouped functionally within Divisions of Human Studies, Natural Science and Professional Services, and an administrative unit.

The headquarters of The Western Australian Museum and its principal display galleries are situated in Perth. Branches have been established in Fremantle (1970), Albany (1975) and Geraldton (1980). The branches are governed by Committees of Management appointed by the Trustees. The Fremantle and Geraldton Branches contain maritime and historical displays, and the Albany Branch has displays relating to the environment, exploration and early settlement of the region.

The work of the Museum is concerned mainly with natural sciences and human studies. Emphasis in both display and research is on the fauna and the human population, past and present, of Western Australia. Research within the Division of Natural Science is related specifically to marine fauna, mammals, birds, reptiles, insects and fossils of the State. The Division of Human Studies is concerned with Aboriginal archaeology and rock art, prehistoric archaeology, Aboriginal material culture, social history, maritime history, underwater archaeology, industrial and agrarian technology, and arms and armour. The Division of Professional Services co-ordinates the work of departments responsible for display, material restoration and conservation, children's educational services, publications, assistance to municipal museums and the research library.

The *Museum Act 1969-1973* allows the Trustees to assist in establishing and maintaining municipal museums. The Museum's role is mainly to assist by making available the expertise of its own staff in advising on the maintenance of collections, restoration of objects and on museum design, and by depositing objects for display in recognised museums.

The Museum is an active educational instrument. Members of the scientific staff lecture in University Extension programmes and in the various departments of tertiary education organisations. Children's centres, staffed by Museum teachers provided by the Education Department, are open during school holidays at Perth and Fremantle. Regular classes for primary schools are held during school terms and special visits are arranged for secondary schools at both museums. In addition special visits at both museums, as well as those at Albany and Geraldton are made by children from schools not included in the regular series. Children voluntarily participate in quizzes and other exercises designed for vacation activities.

#### THE WESTERN AUSTRALIAN MUSEUM (a) (b)

Particulars		1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Expenditure —							
Salaries and wages	\$	1,169,945	1,232,034	1,565,150	1,814,443	2,052,178	2,380,526
Other	\$	274,350	710,524	741,398	1,050,101	921,637	1,082,146
Total	\$	1,444,295	1,942,558	2,306,548	2,864,544	2,973,815	3,462,672
Square metres of —							
Display area (c)		3,050	3,290	3,830	3,830	3,642	4,590
Storage area (c)		3,444	3,527	3,527	3,527	3,381	3,381
Total		6,494	6,817	7,357	7,357	7,023	7,971
Number of —							
Staff (c)							
Professional		46	48	49	50	49	57
Technical		58	48	51	48	53	51
Administrative and clerical		24	26	28	28	30	30
Attendant-receptionist		23	34	36	36	36	47
Total		151	156	164	162	168	185
Man-days spent on field work		1,543	2,456	4,268	4,298	4,143	4,513
Visits by school parties		1,672	1,917	1,836	1,668	1,775	1,750
Children attending in school parties		51,522	65,128	52,407	49,908	52,573	51,714
Children attending vacation activities		(d) 7,600	10,326	9,543	11,169	17,804	14,549
Total visitor's attendances (e)		227,028	234,861	289,850	335,496	(f) 351,236	(g) 379,203

(a) Including Fremantle Branch. (b) From 1975-76 includes Albany Branch, opened September 1975. (c) At 30 June. (d) Estimated. (e) Including attendances of school children. (f) Including attendance of 23,792 at Museum's Travelling Exhibition. (g) Including attendance of 18,403 at Museum's Travelling Exhibition.

In connection with its work of education, research and conservation, the Museum is often called upon to act in an advisory capacity to government departments. In particular, senior staff serve on committees formed for the purpose of protection of the heritage, the environment and wildlife. The Museum is assisted in certain fields by Honorary Associates of The Western Australian Museum, some of whom serve on its advisory committees.

Under the provisions of the *Aboriginal Heritage Act 1972-1980* the Museum is responsible for administering the work of the Aboriginal Cultural Material Committee. The Act requires that the Registrar of Aboriginal Sites, the principal executive officer of the Committee, shall be a member of the staff of the Museum. The main function of the Committee is to evaluate and record Aboriginal sites and specific traditional Aboriginal artefacts within Western Australia and to advise the Trustees on their preservation.

By a decision of the High Court in March 1977, provisions of the *Maritime Archaeology Act 1973* dealing with maritime archaeological material lying in waters adjacent to the coast of Western Australia, or derived from such sources, were superseded by the *Historic Shipwrecks Act 1976* (Commonwealth). However, the provisions of the Commonwealth Act have permitted the Museum to continue its maritime archaeology programme and to undertake inspection and control of wrecks scheduled in the Act. There are currently sixty-three wrecks scheduled; these include those previously protected by the *Maritime Archaeology Act 1973*.

Under the provisions of the *Museum Act 1969-1973* all meteorites are declared to be the property of the Crown and are vested in the Museum.

### THE ART GALLERY OF WESTERN AUSTRALIA

The Art Gallery of Western Australia is under the control of a Board of seven members appointed by the Governor under the provisions of the *Art Gallery Act 1959-1978*.

A new art gallery building, commenced in 1977, was opened on 2 October 1979. This represents the first stage of the Perth Cultural Centre. The building is designed on an hexagonal form to allow maximum use of space and flexibility of display. It incorporates seven major galleries, including a specialist ethnic gallery, an auditorium, conservation laboratories, a prints and drawings study room, a restaurant, a bookshop and a reading room. Storage areas, mechanical and electrical plant, packing rooms and a workshop are located in the basement area. The building is fully airconditioned and humidified.

The gallery Administration Centre, linked to the art gallery via a walkway, incorporates a library, a theatrette and the Art Gallery Society rooms.

A service is provided to country areas. Education officers take on tour exhibitions of art works from the Art Gallery collection. Selected art works are circulated to metropolitan primary and secondary schools and to tertiary institutions.

The Art Gallery operates a general information service; publications on the collection are available and tours conducted by volunteer gallery guides are arranged. Films are screened regularly in the theatrette and a series of musical recitals by local artists are held in the auditorium. Both are open to the public and are free.

Exhibitions and activities for children, which are supervised by the Galleries' education officers are held during school time and over the holidays.

The Director and professional staff are often called upon to judge exhibitions, present lectures and sit on various planning and advisory committees.

The Gallery is constantly making acquisitions for its permanent collection, and the Great Australian Paintings Appeal in 1978-79 enabled the Gallery to expand its collection with a number of excellent works of important Australian artists. Gifts of art works and donations by the Art Gallery Society and individuals also enhance the Gallery's collection.

## THE ART GALLERY OF WESTERN AUSTRALIA

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Expenditure —						
Salaries and wages	\$ 218,554	277,477	373,200	389,606	448,961	708,373
Acquisition of exhibits	\$ 78,414	95,753	217,766	467,206	281,521	608,002
Special exhibitions	\$ 21,057	23,781	47,419	56,367	117,539	94,039
Printing	\$ 8,103	9,118	25,222	34,693	21,937	42,218
Other	\$ 61,093	(a) 654,372	(b) 308,491	(c) 2,218,845	(d) 1,360,948	(e) 1,166,779
Total	\$ 387,221	(a) 1,060,501	(b) 972,098	(c) 3,166,717	(d) 2,230,906	(e) 2,619,411
Number of —						
Staff (f) —						
Full-time —						
Professional	12	11	9	12	12	20
Administrative and clerical	6	6	9	12	10	12
Attendants	—	—	—	—	11	21
Other	(g) 14	(g) 17	(g) 20	(g) 19	8	6
Honorary	3	2	2	1	—	—
Part-time	—	—	—	—	1	7
Total	35	36	40	44	42	66
Exhibits for display (f) —						
Oil paintings	581	602	617	682	704	722
Water colour paintings	225	236	248	429	442	460
Drawings	489	505	549	1,164	1,182	1,196
Engravings, prints, woodcuts	1,640	1,702	1,742	1,989	2,048	2,099
Sculptures	77	80	83	101	102	116
Metalware — Contemporary	200	200	200	200	207	216
Primitive and traditional	106	110	111	111	117	123
Glassware	134	136	136	136	139	143
Textiles — Contemporary	17	18	18	19	20	22
Primitive and traditional	14	14	14	14	19	20
Wood — Contemporary	—	3	3	3	5	6
Primitive and traditional	41	59	59	59	59	59
Furniture	38	48	48	49	54	54
Ceramics — Contemporary	483	488	493	548	582	608
Primitive and traditional	135	143	144	146	150	154
Miscellaneous	45	45	45	59	95	96
Support Policy W.A. Artists	—	—	—	12	31	55
Aboriginal and Melanesian	476	496	499	499	499	499
Total	4,701	4,885	5,009	6,220	6,455	6,648
Special exhibitions	8	9	7	10	10	31
Visitors' attendances	114,378	118,704	100,670	111,661	73,728	211,521

(a) Includes an amount of \$555,934 representing the cost of renovating and equipping the new administration centre. (b) Includes an amount of \$194,678 being balance of costs for renovating and equipping the new administration centre. (c) Includes progress payments on construction of new gallery, \$1,763,886 and loan redemption payments, \$272,675. (d) Includes an amount of \$800,000 progress payments on new gallery and \$355,628 loan redemption payments. (e) Includes \$200,000 payments on new gallery, and \$462,161 loan redemption expenditure. (f) At 30 June. (g) Includes attendants.

## THE WESTERN AUSTRALIAN ARTS COUNCIL

The Western Australian Arts Council was established by the *Western Australian Arts Council Act 1973*, operative from 1 December 1973. The Council took over the functions of the Western Australian Arts Advisory Board. In terms of the Act, 'it shall be the general duty of the Council to encourage, foster, and promote the practice and appreciation of the arts in Western Australia'. The Council may make grants, pay subsidies or furnish advances to local authorities, organisations or persons engaged in activities consistent with this duty. Subject to the provisions of the Act, the Council may 'generally do whatever it considers necessary or expedient in order to stimulate artistic or cultural activity'.

The Council is charged with three specific functions: to enhance the standards of performance and execution in all aspects of the arts; to make accessible to the public of Western Australia all forms of artistic and cultural work; and to foster and maintain public interest in the arts and culture of the State.

The Council undertakes these functions through the funding of arts organisations and events which could not operate or take place without financial support; through a training

programme throughout the State which includes performances, exhibitions and tutors; and through a development and advisory service which encourages self-help whilst providing assistance from a central source.

Funds available to the Council to enable it to exercise its functions include amounts appropriated by the State Parliament or made available by the Commonwealth Government, amounts borrowed by the Council under the provisions of the Act, and moneys which may be advanced by the Treasurer.

The Council is affiliated with, and receives financial support from, the Arts Council of Australia (Federal Division).

### STATE GOVERNMENT OBSERVATORY

The Perth Observatory was originally established, near Kings Park, in 1896; the present buildings, near Bickley in the Darling Range, were officially opened on 30 September 1966.

The astronomical instruments at the Observatory are a photographic refractor of thirty-three centimetres aperture combined with a guiding telescope of twenty-five centimetres aperture, the Hamburg Observatory's nineteen-centimetre meridian transit telescope, the Lowell sixty-centimetre reflector, a forty-centimetre reflector constructed by the Physics Department of the University of Western Australia and a Celestron thirty-six centimetre Schmidt Cassegrain reflector.

The photographic refractor is used for investigations of stellar motions based on measurements of old (1900-1920) and recent photographs; for the recovery of minor planets which have been unobserved for several years; for positional observations of comets, which are used in investigations of comet orbits; and for securing photographs, to a faint magnitude limit, of significant areas of the southern sky, which may be used in the future in determinations of stellar motions.

From late in 1967 to the end of 1971, a team of astronomers from the Hamburg (West Germany) Observatory carried out a programme of observations of the positions of reference stars in the southern hemisphere. Their automated meridian transit telescope is now on indefinite loan to the Perth Observatory. From the end of 1972 to the middle of 1976, a Perth team using the Hamburg equipment carried out sixty thousand observations within the frame of an international programme to improve and extend the fundamental catalogue of star positions. From August 1976 until August 1980 work with the Hamburg equipment was continued on a programme with the emphasis on observing supporting stars in the southern hemisphere. These observations will be used to determine a reference frame of faint stars by means of which the positions of galaxies can be determined. In this way it will be possible to relate the present fundamental system of star positions to an extragalactic reference frame. From August 1980 a new observing programme has been carried out, comprising FK4 stars, certain and suspected radio stars, suspected population II stars, all stars brighter than mag 7.0 between declination  $+ 37.5$  and the South Celestial Pole, pulsating variables, reference stars to radio stars and stars of astrophysical interest; a total of 14,702 stars.

The sixty-centimetre reflecting telescope was installed at the beginning of April 1971. It was originally used for observation in the International Planetary Patrol Program, which was financed by the National Aeronautics and Space Administration of the United States of America and conducted by the Lowell Observatory, of Flagstaff, Arizona, U.S.A. This programme involved the photography of the planets Mars, Jupiter, Saturn and, occasionally, Venus. Several different observatories, well distributed in longitude, participated using identical cameras and optical systems. Each planet was photographed systematically through four standard colour filters throughout the period during which it was available. The purpose of this programme was to set up an extensive library of photographs for the study of temporal variations in the atmospheres and surface features of these planets.

The telescope is also equipped with a photo-electric photometer to measure brightness of celestial objects and was used in 1973 to record a series of mutual occultations and eclipses between the four major satellites of Jupiter. This photometer has also been used for investigations of the variations in brightness of stars, planets, satellites and asteroids.

The forty-centimetre University telescope is intended for joint use with researchers from the University of Western Australia mainly for direct photography in the Newtonian and Cassegrain focus, but also for photometry and spectroscopy in the Cassegrain mode. Additionally, this instrument was equipped in 1977 with a two-channel fast photometer to be utilised for accurate timing of star occultations by the moon, and other events requiring high time resolution. The thirty-six centimetre Celestron telescope is equipped with a solid state photodiode UBVRT photometer and is employed generally for photometry and occultation of stars by minor planets.

The computer facilities of the Perth Observatory have improved greatly in recent years. The acquisition of data from the five telescopes via recorders or direct on line is now possible. Video cameras are also employed to search and blink the photographic plates as well as to record the information on video tape.

The policy of the Perth Observatory is strongly directed towards providing collaboration in the area of astrometric research with other observatories and research groups. It maintains the time service for the State, and provides an astronomical information service for educational and general interest inquiries. It is open to visitors daily, except Saturdays, at 3 p.m.

#### STATE GOVERNMENT CHEMICAL LABORATORIES

In 1922 the various chemical services of the State Government were amalgamated to form the Government Chemical Laboratories, primarily for the performance of chemical work required by government departments. In addition, the Laboratories serve government instrumentalities and semi-government authorities and undertake some chemical work for the general public. The activities of the Laboratories are organised under seven Divisions, the separate functions of which are described briefly in the following summary.

The *Agricultural Chemistry Division* provides chemical expertise to government departments, farmers, industry and private individuals relating to the chemistry of plants, soils, feeding stuffs and fertilisers and its application to agricultural research, including plant nutrition, crop and pasture production, soil fertility, efficient use of fertilisers, animal nutrition, animal health and meat production. Other activities include studies of effects of environmental pollution, regulatory work on fertilisers and oilseed quality, physical characteristics of materials used for dam construction and use of a computer for automatic chemical analysis.

The *Engineering Chemistry Division* is concerned mainly with research and development aspects of the utilisation of the State's mineral resources with some attention to solid fuels. Specific technological problems are investigated at the Division's own initiative or at the request of government departments, companies or individuals. Facilities are available for small and large scale testwork on ore dressing, mineral processing, metallurgical techniques and some aspects of fuel utilisation. Technical advice on these topics is provided as a consultative service. The *Kalgoorlie Metallurgical Laboratory* functions as a section of the Division in providing a regional service to government, the mining industry and prospectors; services include metallurgical investigations, analyses of ores and minerals, and advisory services. The laboratory specialises in ore dressing techniques and all aspects of gold metallurgy.

The *Food and Industrial Hygiene Division* is primarily concerned with food quality, working environments and pesticide residues. Foods are examined with respect to their nutritional value, adulteration, possible contamination, compliance with the appropriate regulatory Acts and suitability for human consumption. In the field of industrial hygiene the Division conducts monitoring programmes and inspections of industrial working conditions with respect to levels of toxic gases, liquids, metals and hazardous chemicals. Recommendations are made to



eliminate, or reduce to acceptable levels, potential health hazards in the work place. Biological specimens are examined to determine possible exposure to toxic substances. Pesticide residues are determined in foods, water supplies, crops and stock in order to assess their compliance with prescribed legislation and acceptability for human consumption. Samples of water, marine life and wildlife are analysed to determine and monitor the impact of pesticides and other pollutants on the environment. The Division also examines changing industrial activities with a view to their possible consequences on human health and on the environment.

The *Forensic Chemistry Division* undertakes the forensic chemical investigations in this State and provides scientific support services for the criminal investigations of and law enforcement by Police. Its activities include toxicological examinations relating to deaths involving drugs or poisons, identification and analysis of illicit drugs, scientific examination of exhibits from scenes of crime to assist in criminal investigations, analysis of blood samples for alcohol in connection with drink-driving offences and fatal traffic accidents. The Division also provides an advisory and analytical service to the racing, trotting and greyhound organisations in connection with doping control.

The *Industrial Chemistry Division* provides technical information and advice on industrial and chemical products for all government departments and instrumentalities, industry and the general public. Areas of particular interest are building materials including all kinds of floor coverings, plastics, paints and chemical specialities, such as detergents, polishes, adhesives and textiles. Facilities are provided for the testing of these materials. Other chemical processing is included with the exception of minerals and fuels, with the provision of advice on the potential for new chemical manufacturing operations and improvements in existing processes. Related experimental investigations up to pilot plant scale can be undertaken.

The *Mineral Division* is basically concerned with studying and recording the mineralogy of the State. This is done by physical and chemical examination of rocks and mineral specimens obtained from departmental and other sources and by the maintenance of a reference collection of minerals from most known occurrences within Western Australia. A professional service in inorganic chemistry and mineralogy is maintained for government authorities (particularly other branches of the Department of Mines). This service includes areas of environmental and occupational health and building materials. In some circumstances this service is extended to the mining industry, prospectors and the general public.

The *Water Division* analyses waters from all parts of the State for government departments and other authorities and also for the public and makes recommendations on their suitability for specific purposes. It also makes recommendations for treatment to convert an otherwise unsuitable supply to one that is satisfactory for the intended use; these uses include drinking, domestic, irrigation, stock, cooling, heating, industrial, swimming pool and other recreational. The Division analyses effluents and trade wastes and makes recommendations for their treatment so that the environmental impact at their disposal site is minimal. It investigates problems associated with water-formed deposits and corrosion of materials in aqueous environments under both ambient and heated conditions. It regularly surveys bodies of water to determine their condition and to assess levels of any undesirable inputs. These include the estuarine systems of Swan, Peel and Leschenault in the South-West and other environmental studies.

#### COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANIZATION

Under management arrangements introduced in December 1978, research conducted by the Commonwealth Scientific and Industrial Research Organization (CSIRO) is carried out within five Institutes; Earth Resources, Biological Resources, Animal and Food Sciences, Industrial Technology and Physical Sciences. Each Institute consists of several Divisions. Of these Divisions, two, Land Resources Management and Mineralogy, have their headquarters in Perth, while several other Divisions utilise laboratories or field stations in Perth and in other parts of Western Australia.

### **Institute of Earth Resources**

**Division of Land Resources Management.** The Division of Land Resources Management is doing research into the better management of Australia's land and water resources. The aim is efficient productivity consistent with conservation of these resources. The work includes environmental and societal implications of resource management in pastoral, agricultural, forestry and near-urban areas, and the development of methods for processing, appraising and communicating information to assist land-use decision making.

The Division has a national responsibility and research programmes are dealing with a number of resource management situations throughout Australia. In addition to its headquarters at Floreat Park, Perth, the Division also has laboratories in Alice Springs (N.T.) and Deniliquin (N.S.W.).

Land-use and related stream salinity is one of the Division's main concerns. Land development across southern Australia has increased the salinity of surface soil and water resources. For example, widespread removal of native vegetation in south-western Australia has resulted in salt (which has accumulated over thousands of years deep in the soil profile) being discharged into streams and groundwater. Some major rivers, and a good deal of agricultural land, are consequently in poor condition. Research is primarily concerned with the effects of clearing new land and the manipulation of existing cleared land to reduce salt discharge.

The Division's research into rural lands recognises that they are an extremely important national resource, producing food and fibre for Australian consumers as well as for export. In this programme, research aims to define the size and state of the various rural resources and the processes that influence changes in their condition. The development of management strategies that minimize deleterious effects of the use of a resource, and that conserve or improve resources, are essential elements of the programme. Current projects include the conservation of soil fertility; integrating farming and forestry in managing landscapes; interactions between farming and wildlife; and minimizing labour inputs into sheep production systems.

Australia's rangelands (the arid and semi-arid grazing lands) constitute a large area of low rainfall and include major parts of five mainland States. Some vegetation types are badly degraded, others less so. Low or unpredictable rainfall is the overriding restriction, and maintenance or restoration of stability and productivity of the vegetation is the principal objective of the Division's work. Extensive grazing is the most likely continuing use of the rangelands. Other alternatives for particular areas include use by Aborigines, the establishment of national parks, tourism and mining.

Forested lands, which surround many of Australia's major cities, supply not only timber but also vital domestic and industrial water supplies, recreational opportunities and animal habitats. The Division is investigating the management of forested lands in relation to the multiple demands made on them and some of the hazards they are subject to, such as jarrah dieback disease.

Management decisions for many major resources are made difficult by a lack of relevant scientific information and inadequate techniques to assess the data. The role of the Division's management systems programme is to acquire and communicate such information and technology to resource managers. The research studies both the processes of management itself and the management of individual important resources, including urban water resources and the coastal zone.

The application of remote sensing is an important aspect of the Division's work. Throughout the world, remote sensing techniques are being applied increasingly in resource inventory, and in monitoring the effects of resource use. This programme aims to develop manual and computer techniques for analysing and integrating satellite imagery, aerial photography and ground survey results for specific application to resource inventory and

monitoring. It is also actively promoting and assisting the application of remote sensing techniques by industry and management agencies.

The Division's newest programme has been formed from components of previous research areas. It aims to study and attempt to solve problems arising from the development of land for agriculture, urban and mining use. The disposal of mine waste, the increased flow of salt from cleared agricultural land, and the efficient management of urban pollution (e.g. garbage and sewerage), are typical of some of the problems which this programme will study.

**Division of Mineralogy.** The Division of Mineralogy is concerned with research bearing on the discovery and definition of Australian mineral resources. Its work deals mainly with the chemical and physical nature of geological processes of mineral formation and alteration.

Under two main programmes, mineralisation and exploration, studies are in progress on processes of ore genesis, particularly with respect to base metal ores, on supergene alteration of these ores, on the geochemical and petrological evidence for defining areas of differing crustal development in the Archaean of Western Australia, and on improving techniques and interpretation of surface geochemical exploration in deeply-weathered arid terrain.

### **Institute of Biological Resources**

**Division of Entomology.** A research group is studying the role of native and introduced dung beetles in burying accumulations of cattle dung and in reducing the abundance of the dung breeding bushfly in the south-west of Australia. Studies on the ecology of the bushfly will provide an estimate of the effectiveness of beetles and associated predatory mites introduced from overseas in reducing numbers of flies, as new beetles become established in different areas and their populations build up.

Jarrah, an important forest tree in Western Australia, is attacked by the larva of a small moth, Jarrah Leaf Miner. Long-term ecological studies of factors affecting the abundance of the pest and that of its natural enemies have shown that outbreaks of the Leaf Miner are more likely to occur in situations where part clearing, thinning and burning have made the forests more attractive to the moths. The findings are consistent with the historical records showing that outbreaks first occurred in the coastal jarrah affected by settlement in the early 1900s and spread to the inland forest between Mount Barker and Manjimup in the 1950s. The effect of the current forest management on the outbreaks is being evaluated.

**Division of Tropical Crops and Pastures.** The Division of Tropical Crops and Pastures is responsible for the operation of the Kimberley Research Station which is situated near Kununurra on the banks of the Ord River in the far north of Western Australia.

The principal objectives of the Station's research are to define the factors and to understand the processes involved in efficient crop and pasture production in the Ord Irrigation Area and in similar environments in northern Australia. High-yielding varieties of grain sorghum are being bred and lines with special characteristics, such as disease resistance, are being identified for distribution to sorghum plant breeders; studies are being undertaken with rice to establish the value of various leguminous crops grown in rotation as sources of nitrogen; a selection programme to find soybean cultivars suitable for wet and dry season sowing in the low latitude tropics, agronomic programmes to establish the cultural practices necessary to achieve high yields of sorghum and soybeans, a study of the problem of mimosine toxicity in cattle associated with the browse shrub *Leucaena* and physiological studies to establish the limits to crop yield imposed by the environment are all proceeding.

**Division of Forest Research.** This Division is represented in the State by a Regional Station located at Kelmscott, with a staff of eleven members. Since its inception at Dwellingup in 1949 the station work has centred on jarrah dieback disease, its ecology, rate of spread and soil microbial relationships, and the susceptibility of native and introduced species to infection and the extent of damage caused to them.

**Division of Wildlife Research.** The Division of Wildlife Research has a research group at Helena Valley, working on the higher vertebrates (more particularly mammals and birds). Investigations cover not only species of economic importance but also native fauna generally.

Studies of the behaviour and ecology of seven species of cockatoos are proceeding. The ecology and behaviour of the Emu and the Noisy Scrub Bird have been the subject of recent studies and certain aspects of the biology of these birds, as well as the effect of Silvereyes on vineyards, are still being investigated.

**Division of Fisheries and Oceanography.** The Division of Fisheries and Oceanography is currently conducting a study of the coastal reef ecology off south-western Australia. Part of this study includes a detailed investigation of the biology of the Western Rock Lobster. In co-operation with the Western Australian Department of Fisheries and Wildlife a population study of the Australian Salmon is being made.

#### **Institute of Animal and Food Sciences**

**Division of Animal Production.** The Division of Animal Production has established a unit in Western Australia. The research covers a wide range of activities aimed at understanding the nutritional and physiological limitations of wool and meat production and at providing new and improved techniques relevant to livestock production. The greater part of the work is in mineral nutrition; emphasis is now upon the diagnosis and correction of sub-optimal trace mineral deficiencies and their interaction with other dietary nutrients. Research in livestock reproduction is principally concerned with investigating the reproductive losses in sheep with particular reference to the problem of clover infertility. The unit also serves to provide a link between the livestock industry and the Division's research workers throughout Australia.

**Division of Food Research.** The Meat Research Laboratory of the Division of Food Research has an extension officer located in the laboratories of the Western Australian Department of Agriculture at South Perth. He is a member of the Meat Laboratory's Industry Section which is responsible for service, investigation, liaison and extension work in meatworks and meat processing establishments, to ensure that the results of investigations by the Commonwealth Scientific and Industrial Research Organization are made known and to encourage their application by the meat industry. The extension officer services processing plants in Western Australia and the Northern Territory and gives a limited extension liaison service to other food processing industries.

#### **Institute of Industrial Technology**

**Division of Chemical Technology.** The Division of Chemical Technology was responsible for the invention and development of the Sirotherm and Sirofloc water desalination and purification processes and other processes which utilise magnetic reagents. At the Metropolitan Water Board's treatment works at Mirrabooka a Sirofloc demonstration plant has been constructed, following successful pilot plant studies on the site by the Division, the Australian Mineral Development Laboratories and the Metropolitan Water Board. The process produces purified water from turbid bore water which contains contaminants such as hydrogen sulphide and organically-bound iron. The demonstration plant is to produce 35 megalitres per day. A Sirotherm demonstration plant capable of desalting 1 megalitre per day of brackish bore water is to be installed at Leederville in 1981. A third water treatment demonstration plant is to be located in the Pilbara, where a magnetic dealkalization process will be utilised to remove hardness and alkalinity from bore water. The demonstration of the three CSIRO inventions follows from the invitation by the Commonwealth Department of Science and Technology for private industry, through the Australian Industrial Research and Development Incentives Board, to assist Government in the development of the new treatment methods.

An officer of the Division is now stationed in the premises of the Division of Land Resources Management at Floreat Park and he is engaged on investigations relating to the development of the woodchip export industry and a possible pulping industry in W.A.

**Division of Building Research.** The Division of Building Research has extensive collaboration with the building, construction and timber industries of Western Australia in many areas including insulation and energy conservation, weathering of materials, the use of waste products, milling and seasoning of timber, preservation of rail sleepers, and computer systems for the organisation of building programmes.

The Division has a major continuing interest in the problems of living in remote communities and is working in a number of mining towns in the tropical region of the State. The research is aimed at demonstrating ways in which conditions can be created that will attract people to settle and stay in these towns.

#### **Institute of Physical Sciences**

**Division of Mathematics and Statistics.** The Division of Mathematics and Statistics is concerned with the mathematical analysis of scientific problems and the application of statistical methods to areas of interest in the applied and biological sciences. Its officers also act in an advisory capacity to other research workers in the State on matters relating to mathematical methods, as well as the design of experiments and the analysis and interpretation of statistical data.

**Division of Computing Research.** The Division of Computing Research, trading as CSIRONET, conducts research and development on various aspects of computing and furnishes a computing service to CSIRO, some government departments, universities and other approved users. There are several central host computers in Canberra and a work-station in Melbourne supplying a variety of computer types. Access is via an Australia-wide network of nodal mini-computers to which are connected various types of peripheral equipment including terminals for interactive computing. Dial-in facilities are also available. The CSIRONET network design allows connection of host machines belonging to other organisations; at present the University of Queensland and the West Australian Regional Computing Centre are connected; there is also a connection to MIDAS (Multi-mode International Data Acquisition Service) which allows access to networks and host computers in the USA. There is a node computer in Perth through which Perth nodes may access all CSIRONET facilities.

**Division of Cloud Physics.** The Division of Cloud Physics is closely involved, in an advisory capacity, with a State Government-supported project, initiated by the W.A. Weather Research Association, a private farmers' group, to study the prospects for rainmaking in the northern wheatbelt.

The Division is also participating in Government-sponsored air pollution studies in the Port Hedland area.

### **DEPARTMENT OF AGRICULTURE**

Reference to the scientific work of the Department of Agriculture appears in the section *The Department of Agriculture* in Chapter VIII, and also in Chapter VII, Parts 1 and 2.

#### **BOTANIC GARDEN**

The Botanic Garden was established in Kings Park in 1962 and is under the control of the Kings Park Board (see following section *Public Parks and Reserves*). The Botanic Garden is the counterpart of The Western Australian Museum in the botanical field and complements the State Herbarium by maintaining collections of living plants for scientific and educational purposes. Its official objects are to foster public interest in the conservation and cultivation of the Western Australian flora; to contribute to public education in this field; to become a centre for botanical and horticultural research in the flora of Western Australia; and to provide a major tourist attraction. The education centre established in the Park caters for more than ten thousand school children each year.

The Garden, which was officially opened in October 1965, extends over thirty-four hectares, made up of the Western Australian collection (seventeen hectares), Californian, South

African and Mediterranean collections (three hectares), and an arboretum of native trees (fourteen hectares). The indigenous flora of the State is represented in the Western Australian collection by approximately 1,200 species. Trees grown as specimens in the arboretum are mainly those which are native to the southern half of the State.

Parties from the Botanic Garden are regularly in the field for the collection of propagating material. Special attention is devoted to the preservation of rare species or species threatened with extinction. Seed of native plants collected is distributed from surplus stocks to botanical institutions throughout the world. A seed list, which normally offers from 1,000 to 1,300 species, is published annually, and more than 10,000 packets of seed are distributed each year.

Experimental work in propagation of native plants is carried out and a Wildflower Exhibition is held in the Park each spring. Lectures are given by members of the staff to interested societies and to students engaged in related courses of study. The public may also, by arrangement, consult the Horticultural Adviser particularly for advice on the cultivation of native plants. Facilities are provided for the employment and training of students enrolled in the three-year course for the Certificate in Horticulture, which is conducted by the Technical Education Division of the Education Department.

#### PUBLIC PARKS AND RESERVES

It is within the power of the Governor to dispose of, in any manner which serves the public interest, lands which are vested in the Crown and, in terms of this authority, Crown land is frequently reserved by order of the Governor for a variety of public purposes. Some of this land is reserved for public recreation and amusement, national and other public parks, or flora and fauna sanctuaries and the reserves are controlled by statutory bodies, the more important of which are dealt with in this section.

#### NATIONAL PARKS AUTHORITY OF WESTERN AUSTRALIA PARKS AND RESERVES VESTED IN THE AUTHORITY 28 FEBRUARY 1981

National Park or Reserve	Area	National Park or Reserve	Area
	hectares		hectares
Alexander Morrison	8,501	Lesmurdie Falls	56
Araluen-Canning Dam Reserve	20	Matilda Bay Reserve	25
Avon Valley	4,377	Millstream	441
Badgingarra	13,121	Moore River	17,543
Boorabbin	26,000	Nambung	17,491
Cape Arid	279,415	Nowergup Lake	117
Cape Le Grand	31,390	Neerabup	1,078
Cape Range	50,581	Peak Charles	39,959
Charles Gardner Flora Reserve	792	Pemberton	3,263
Chichester Range	150,609	Penguin Island Reserve	13
Collier Range	277,841	Porongurup	2,401
D'Entrecasteaux	36,599	Porongurup Range Reserve	61
Drovers Cave	2,681	Rudall River	1,569,459
Drysdale River	435,591	Scott	3,273
East Perth Cemetery Reserve	5	Serpentine	635
Eucla	3,342	Sir James Mitchell	1,087
Fitzgerald River	242,739	Stirling Range	115,671
Frank Hann	49,877	Stockyard Gully	1,406
Geikie Gorge	3,136	Stokes	9,493
Geekabee Hill Flora Reserve	4	Tathra	4,323
Goongarrie	49,878	Torndirrup	3,869
Gooseberry Hill	33	Tunnel Creek	91
Greenmount	56	Walpole-Nornalup	18,116
Haddleton Flora Reserve	1,325	Walyunga	1,790
Hamersley Range	617,606	Watheroo	44,324
Hassell	1,281	William Bay	1,867
John Forrest	1,578	Windjana Gorge	2,134
Kalumunda	375	Wolf Creek Crater	1,460
Kalbarri	186,076	Yalgurup	11,545
Keane's Point	2	Yanchep	2,799
Leeuwin — Naturaliste (a)	13,239	Yanchep Flora Reserve	113
Total area of National Parks and Reserves		4,363,973	

(a) Portion of unsurveyed coast not included.

The *National Parks Authority Act 1976*, which came into operation on 1 August 1976 provides for the vesting and management of certain areas as National Parks or Reserves, for the conservation of the natural environment, the preservation and enhancement of natural beauty, and the provision of access and facilities for public recreation. The Act constitutes a National Parks Authority of Western Australia of nine members and provides for the appointment of a Director of National Parks. Under the legislation, areas of the State formerly controlled by the National Parks Board, established under the *Parks and Reserves Act 1895-1978*, became the responsibility of the National Parks Authority.

Members of the National Parks Authority of Western Australia, appointed by the Governor, comprise a President, nominated by the Minister; the holders (or their nominees) of the offices of the Conservator of Forests, the Director of Fisheries and Wildlife, the Director of the Department of Tourism and the Surveyor General; and four persons nominated by the Minister to represent the interests of the public with respect to primary industry, local government matters and conservation or community service matters relevant to the concept of National Parks.

The *National Parks Authority of Western Australia* controlled fifty National Parks and a number of other reserves at 28 February 1981, totalling in all about 4.4 million hectares in area. Flora and fauna are protected and firearms prohibited in all National Parks and Reserves controlled by the Authority. Picnic, recreational, camping and caravan facilities are available in certain parks and reserves.

The *King's Park Board* administers an area of almost 401 hectares close to the centre of Perth. Part of this area was dedicated in 1872 'for the purpose of a public park and recreation ground' and was enlarged in 1890. Beautification commenced in 1896 under the presidency of Sir John Forrest, and the name was changed in 1901 from Perth Park to The King's Park in honour of the accession of King Edward VII. In addition to its original function as park and recreation ground, The King's Park (now referred to as Kings Park) has over the years gradually developed two other important functions, as a National Shrine and as a Botanical Reserve. In the former case it houses the State's most important monuments and commemorative features of a military and historical nature. A memorial to the South African war was built in 1901, and the State War Memorial to the fallen of both world wars was erected on a commanding position on Mount Eliza in 1929 and extended in 1952. 'Honour Avenues' of trees dedicated to individual fallen servicemen were planted in 1919 and later, and another avenue commemorates the State Centenary of 1929. There are smaller memorials erected by individual regiments or other military units, and a number of monuments to important historical personages.

The concept of the botanical reserve grew from the fact that four-fifths of the Park's area remained undeveloped under a natural bushland which contained many native wildflowers. Increasing urbanisation and the loss of natural sites in and close to Perth made the retention of this bushland area a matter of scientific and aesthetic value. This function was strengthened from 1962 onwards by the establishment in the Park of a botanic garden and arboretum of thirty-four hectares for the cultivation and display of Western Australian native plants.

Recent developments have continued to contribute to the Park's aesthetic and recreational functions. A fully-equipped modern restaurant was erected in 1956, close to such features as a floral clock, a wishing well, a giant karri log and an observation platform. There are several public barbecue sites and many kilometres of pedestrian paths and tracks. The original twenty hectares of lawns and shrubberies have been materially extended by the Botanic Garden development. Four new lawns have been added within the Garden, one of which encircles a landscaped water garden with four pools, two cascades and a waterfall, one pool featuring an illuminated fountain dedicated to the pioneer women of the State. Nearby the Women's Commemorative Pavilion and Wall records 150 years of achievement of women in Western

Australia and provides a venue for band concerts. A pioneer women's roll is housed in the Administrative Centre. A picnic lawn, refreshment kiosk, and children's nature playground have been established around an artificial lake at the western end of the park and linked to older-developed areas by a mile-long vista leading to a viewing tower. The lawns and pine plantations near the Subiaco entrance have been reshaped as a family recreation area with a variety of play equipment, barbecues, and a small amphitheatre for outdoor performances.

The *Zoological Gardens Board* administers the Zoological Gardens at South Perth, an area of eighteen hectares of animal enclosures, lawns and gardens. The Zoological Gardens were established in October 1898 for the collection and display of mammals, birds, reptiles and fish from all parts of the world, but specialising in Australian, and particularly Western Australian, fauna. The Zoo is open to the public every day of the year. During the year ended 30 June 1980, 129 species of mammals, 275 species of birds and 46 species of reptiles were exhibited. In this period 378,609 people paid for admission and, in addition, 4,000 disadvantaged children and adults were admitted free. A large Great Ape Complex has recently been completed.

The *Rottneest Island Board* administers as a tourist and holiday resort a reserve of 1,930 hectares comprising almost the whole of Rottneest Island, which is situated about eighteen kilometres west of Fremantle. There are two settlements. One at Thomson Bay contains 172 cottages and bungalows to let, a hotel, lodge, restaurant, camping areas and all services. Recreational facilities include a golf course, tennis courts and a bowling green. A second settlement is under construction at Geordie Bay — Longreach and by 1982 it will provide an additional one hundred cottages, eighty of which have been completed. This settlement will be self-contained and provide all back-up facilities. The coastline is ringed by a road system with access to the various swimming and fishing areas. There is a land-backed wharf and three jetties in Thomson Bay and jetties at Geordie Bay and Green Island. Special features of the island include the marsupial known as the Quokka and the Rottneest Island Daisy. The island is served daily by air and sea transport. Visitors to the island in 1979-80 totalled 240,600.

*Caves Reserves.* Extensive limestone caves have been discovered at several places in the south-west part of the State. Some of them, between Cape Naturaliste and Cape Leeuwin and at Yanchep, have been developed for public inspection and certain areas of the surrounding land have been reserved, notably at Yanchep, Yallingup, Margaret River and Augusta.

*Local Government Reserves.* Many local authorities hold land for recreational purposes, the areas having been either Crown land vested in the Council, acquired by way of purchase, or received under private bequest. Included in these local government reserves are areas required to be surrendered to the Crown by private owners, when subdividing land into residential lots in order to provide recreational areas for the holders of lots in the subdivision. The reserves are frequently developed as public parks or to provide facilities for sports or camping.

## SPORT AND RECREATION

The Department for Youth, Sport and Recreation which became operative on 1 January 1979 is responsible to the Minister for Recreation for matters relating to recreation, sport and youth.

The Department replaced the Youth, Community Recreation and National Fitness Council, a statutory authority established in 1973.

The *Youth, Sport and Recreation Act 1978* establishes a Youth, Sport and Recreation Advisory Committee.

In terms of the Act the Committee shall consist of seven members: one *ex officio* member, namely the Permanent Head of the Department; and six other members, appointed by the Governor, shall be persons from the community nominated for appointment by the Minister for their knowledge, experience or association with the administration or development of recreation, local government, sport and youth.



The role of the committee is to encourage community participation in recreation including sporting and youth activities.

The Department for Youth, Sport and Recreation makes recommendations to the Minister for Recreation concerning government grants to local government authorities and community groups for capital works; for special development projects; for training courses for coaches, leaders, officials and administrators; for salary subsidies to sporting and youth associations; for travel subsidies for selected persons travelling to national championships; for the purchase of items of equipment and for the establishment of regional and specialised equipment hire centres.

The Department has appointed community recreation advisers to local government authorities to assist them in providing for the leisure needs of the community. These officers also participate in the planning of new, and management of existing, local government recreational resources and provide an information exchange service to ensure optimum use of facilities. Thirty-seven local government authorities are serviced by this scheme.

Camps which provide low cost accommodation and recreation facilities for youth, sporting, recreational organisations and family groups are fully operative at Quaranup near Albany, at the historic old hospital at York, eighty kilometres east of Perth, at Sorrento on the coast north of Perth, at Point Peron on the coast south of Fremantle, at Bickley east of Perth in the Darling Range, at Guildford near Perth Airport, at Point Walter on the Swan River, at Wellington Mills near Collie, at Myalup near Harvey, at Tone River near Manjimup and at Balingup. A new recreation camp is being developed at Woodman's Point.

The Department conducts training courses, education programmes and seminars for people working in a voluntary capacity in youth, sport and recreation. A number of services which relate specifically to sport are conducted under the auspices of the Western Australian Institute of Sport. Of particular significance are the Coaching Accreditation Scheme which trains over 1,000 sports coaches each year, and the national coaching journal *Sports Coach*. In addition, the Department works closely with agencies and individuals serving the needs and assisting with the personal development of young people. As part of this aim the Department administers the Duke of Edinburgh's Award Scheme in Western Australia. The Department has a special branch to provide services in relation to recreation opportunities for disabled people.

The Department has an extensive equipment hire centre at its headquarters at Perry Lakes Stadium, west of Perth. A comprehensive selection of books, leaflets and other resource material is kept to assist people providing or conducting recreation programmes. A technical advice service is available to local government authorities, sporting and recreation organisations and private developers.

The national, active recreation campaign entitled 'Life. Be in it.', launched in all States in November 1977, is conducted in Western Australia through the Department for Youth, Sport and Recreation. The campaign, which is funded by the State Government, and until 30 June 1981 also by the Commonwealth Government, aims to encourage wider community participation in all forms of leisure activity and early indications are that a measure of success is being achieved.

A 'Community and Occupational Fitness' branch was established in 1980 to promote health and fitness in the community.

## *Chapter V—continued*

### **Part 3 — Health Services, Hospitals, and Care of the Aged and Disabled**

The Commonwealth Government and State Government health authorities, together with Boards of Health under local government administration, co-operate in maintaining health services and in the prevention and control of infectious diseases in Western Australia.

#### **NATIONAL HEALTH SERVICES**

National Health Services are provided under the *National Health Act 1953*, the *Nursing Homes Assistance Act 1974* and the *Health Insurance Act 1973* which are administered, subject to the direction of the Minister for Health, by the Department of Health, with a Director-General as its Administrative Head. In each State there is a Director of Health, responsible to the Director-General. Benefits authorised by the National Health Act, the Nursing Homes Assistance Act and the Health Insurance Act are paid from the National Welfare Fund, to which reference is made in Chapter VI, Part 1 — *Public Finance*.

#### **National Health Benefits**

The Health Insurance Act established the Australian Health Insurance Program (Medibank) which came into operation on 1 July 1975. This programme provided medical benefits, hospitalisation without charge in standard wards of public hospitals and free out-patient treatment.

From 1 October 1976 the *Health Insurance Levy Act 1976* imposed a levy on taxable incomes as a contribution to the health costs of standard Medibank beneficiaries. Exemption from payment of the levy could be obtained by insuring for basic medical and hospital benefits with a registered health insurance organisation.

Under amendments to the *Health Insurance Act 1973* and the *National Health Act 1953* effective from 1 November 1978 the compulsory health insurance levy was abolished and there is no obligation for persons to carry medical insurance. The Commonwealth provided a universal medical benefit of 40 per cent of a scheduled fee. This universal medical benefit was abolished from 1 September 1979. Since that date the Commonwealth benefit has been the amount by which the Schedule Fee exceeds \$20 for each medical service. Accommodation in standard wards of public hospitals with treatment by doctors engaged by the hospital is still available free of charge.

Persons with pensioner health benefit entitlements and the dependants of such persons are eligible to receive benefits from the Commonwealth at 85 per cent of the Schedule Fee for each medical service, with a maximum patient payment of \$5.00 for any one service, where the Schedule Fee is charged.

Medical practitioners may bill the Commonwealth directly for services rendered to either disadvantaged persons or pensioner health benefit beneficiaries, provided they do not have medical insurance with a registered medical benefits organisation.

#### **Hospitals**

The provision of finance for hospitals is based on agreements made under the *Health Insurance Act 1973* between the Commonwealth and the State Government. The agreements operating from 1 October 1976 contain the following main points: recognised hospitals are to provide free accommodation and treatment to certain categories of patients and to make charges,

at agreed rates, in respect of other categories of patients; doctors treating patients receiving free accommodation and treatment are to be paid by hospitals on certain agreed bases; and the Commonwealth Government is to meet 50 per cent of approved net operating costs of State hospital systems, expressed in aggregate budgets jointly formulated and approved.

The following table shows health cash benefits to persons in Western Australia in recent years.

**COMMONWEALTH GOVERNMENT HEALTH CASH BENEFITS  
TO OR FOR PERSONS IN WESTERN AUSTRALIA  
(\$'000)**

Item	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
<b>Hospital and clinical services —</b>						
Hospital benefits for pensioners	2,276	606	—	—	—	—
Hospital benefits, n.e.c.	8,818	6,257	1,225	19	9	—
Hospital benefits re-insurance	—	—	—	1,288 (a)	—2,100 (a)	—3,378 (a)
Nursing home benefits	14,665	18,772	22,228	24,384	26,390	31,149
Tuberculosis campaign — Allowances	56	77	62	107	68	49
Rehabilitation of ex-servicemen	29	17	30	34	34	57
Medibank — Private hospital daily bed payments	—	5,175	5,993	5,883	5,940	5,481
<b>Other health services —</b>						
Medical benefits for pensioners	3,539	372	—	—	—	—
Medical benefits, n.e.c. (b)	15,898	5,737	74	19	—	40,777
Pharmaceutical benefits for pensioners	5,310	7,104	7,609	8,469	9,917	11,047
Pharmaceutical benefits, n.e.c.	8,834	9,999	8,185	8,854	8,370	7,670
Medibank — Medical benefits (b)	—	42,067	35,702	21,168	36,301	—
Domiciliary care	762	847	912	877	876	900
Isolated patients assistance	—	—	—	—	54	352
<b>Assistance to aged persons —</b>						
Age pensions	118,492	156,447	183,519	216,111	238,241	258,650
Delivered meals	145	130	208	225	239	155
Personal care	883	1,160	1,403	1,420	1,630	1,800
Telephone concessions	509	730	846	902	944	1,199
<b>Assistance to incapacitated and handicapped persons —</b>						
Invalid pensions	20,320	27,066	33,666	39,321	46,592	54,228
Sheltered employment allowances	575	980	1,250	1,493	1,765	1,997
Handicapped children's benefits	309	985	1,062	1,471	1,428	1,455
Rehabilitation services	907	472	1,219	1,453	1,693	1,974
<b>Assistance to unemployed and sick persons —</b>						
Unemployment benefits	19,753	33,824	42,958	59,324	82,842	87,402
Sickness benefits	4,415	6,190	6,814	7,585	7,200	8,676
Special benefits	776	1,238	1,370	2,114	2,897	4,653
Structural adjustment assistance	252	91	1	—	—	—
Other	—	—	2	—	8	26
<b>Assistance to ex-servicemen —</b>						
War and service pensions and allowances	36,996	43,677	52,519	62,501	67,067	74,995
Other benefits	345	297	263	280	209	207
<b>Assistance to widowed and deserted spouses —</b>						
Widows' pensions	18,459	24,809	27,700	32,290	36,329	40,647
<b>Assistance to families and children —</b>						
Family allowance	19,084	22,737	89,514	90,809	88,151	89,558
Maternity allowances	659	632	645	625	317	—
Supporting parents' benefits	8,102	12,547	15,588	18,602	22,996	27,590
Orphans' pensions	76	101	93	118	133	142
Other social security and welfare programmes	228	313	321	346	388	420
<b>Total</b>	<b>311,472</b>	<b>431,456</b>	<b>542,981</b>	<b>608,092</b>	<b>686,928</b>	<b>749,878</b>

(a) Contribution to the national pool by health benefit funds in Western Australia. (b) Payment of Commonwealth Medical Benefits was transferred to the National Welfare Fund 1 July 1979.

### Nursing Home Benefits

From 1 October 1977 changes to the *National Health Act* 1953 provided for a basic Commonwealth nursing home benefit for uninsured patients. At the same time, insured patients in nursing homes became entitled to receive the same level of benefit payable by the registered hospital benefit organisations. Also from that date the supplementary nursing home benefit for extensive care patients was increased from \$3.00 to \$6.00 per day.

Certain charitable and non-profit organisations conducting nursing homes are eligible to participate in an alternative subsidy scheme which provides for deficit funding under the *Nursing Homes Assistance Act* 1974.

### **Domiciliary Nursing Care Benefit**

Domiciliary nursing care benefit is paid to assist in meeting the cost of home nursing for persons aged sixteen years or over who are chronically ill and are being cared for in the private home of a relative or other approved person. The benefit applies to a patient who has a continuing need for nursing care, and is receiving such care given by or under the supervision of a registered nurse.

### **Pharmaceutical Benefits**

All persons receiving treatment by a registered medical practitioner are entitled to receive benefits through approved pharmaceutical chemists or, in certain circumstances, medical practitioners.

The drugs and medicinal preparations available as pharmaceutical benefits are determined by the Minister on the advice of the Pharmaceutical Benefits Advisory Committee.

### **Tuberculosis Medical Services and Allowances**

From 1949-50, under the provisions of the *Tuberculosis Act* 1948, the Commonwealth Government reimbursed each State for approved expenditures incurred in the diagnosis, treatment and control of tuberculosis. The incidence of tuberculosis has been brought under control in Australia, and Commonwealth assistance under this programme ceased as from 31 December 1976, the costs incurred by recognised hospitals in treating tuberculosis patients being included within the scope of the Commonwealth/State cost sharing agreement.

Provision is made in the Act for allowances to be paid to sufferers from tuberculosis and their dependants. There is a means test which does not, however, apply to persons aged seventy years and over. The allowances are determined by the Director-General of Health, subject to the direction of the Minister. In certain circumstances, additional benefits may be paid in the form of a mother's or guardian's allowance or supplementary assistance.

## **STATE GOVERNMENT HEALTH SERVICES**

The principal Statute relating to the provision and regulation of health services in Western Australia is the *Health Act 1911-1979*, which is administered, subject to the control of the Minister, by a Commissioner of Public Health. The Act is comprehensive in scope and confers on the Commissioner the powers necessary for the prevention and control of infectious diseases; the enforcement of sanitation, building and pure foods standards; the control of nuisances and offensive trades; the regulation of the sale of pesticides and the manufacture of therapeutic substances; and the registration of private hospitals and the licensing of maternity homes. Other Acts under Public Health administration are the Anatomy Act, the Clean Air Act, the Cremation Act, the Noise Abatement Act, the Poisons Act and the Radiation Safety Act.

The Department of Public Health maintains a pathology laboratory service which provides diagnostic medical laboratory services to government non-teaching hospitals, charitable institutions and general practitioners who elect to use it. It also shares with the Department of Medicine of the University of Western Australia much of the diagnostic medical laboratory of the Queen Elizabeth II Medical Centre. A range of reference laboratories is available, some of which serve the whole of Western Australia. A public health epidemiological service is provided for the State; nutritional, health and other surveys are undertaken; and forensic pathology work is done for the Police Department and Crown Law Department.

The Health Education Unit of the Department of Hospital and Allied Services, through its central and regional offices, provides training and resource material for health education activities throughout the State.

The Cancer Council of Western Australia is constituted under the provisions of the *Cancer Council of Western Australia Act 1958-1980* as a statutory body with the functions of co-ordinating, promoting and subsidising research into the cause, diagnosis, prevention and treatment of cancer.

The Western Australian Government subsidises the cost of dental care for pensioners and persons on low incomes who are treated at the Perth Dental Hospital and at its clinics in the metropolitan area and some major country centres. Co-operating dental practitioners assist in the conduct of a subsidised dental programme by the Department of Hospital and Allied Services in other areas.

### Infectious Diseases

The *Health Act 1911-1979* provides for the compulsory notification of infectious diseases and for the application of preventive measures. For the purposes of the Act, infectious diseases are those which are specified in the Act, as well as any other diseases which may, from time to time, be declared. The occupier of premises where such a disease occurs is required to notify the local authority forthwith. The medical practitioner who attends a person suffering from an infectious disease must, on the day on which he becomes aware of the nature of the disease, notify the occupier and also the local authority and the Commissioner of Public Health.

On the appearance of any epidemic, endemic or contagious disease, the local authority is required to notify the Commissioner immediately and to report periodically on the disease. The Act provides for the disinfection and cleansing of premises and for the disinfection and destruction of bedding, clothing or other articles which have been exposed to infection. The Commissioner may require any person suspected to be suffering from, or to be a carrier of, an infectious disease to submit to medical examination.

In May 1965 the National Health and Medical Research Council at its Fifty-ninth Session proposed a basic list of diseases to be notifiable in each State and Territory and the following table is based upon that proposal. The table does not include all diseases which are notifiable in Western Australia.

Leprosy and trachoma are endemic among the Aborigines of the Kimberley Division in the far north of the State, and cases are, with few exceptions, confined to the Aboriginal population. The Department of Public Health and the Northern Territory Medical Service co-operate in the control of these diseases.

NOTIFIABLE DISEASES — NUMBER OF CASES NOTIFIED (a)

Disease	1975	1976	1977	1978	1979	1980
Brucellosis	1	—	1	—	1	3
Cholera	—	—	—	(b) 1	—	—
Diphtheria	—	—	—	—	—	—
Infectious hepatitis	258	272	211	270	127	228
Leprosy	15	20	17	15	12	9
Leptospirosis	2	1	—	1	1	9
Paratyphoid fever	—	1	1	2	—	—
Poliomyelitis	—	—	—	—	—	—
Tetanus	—	—	1	—	—	—
Tuberculosis	166	110	155	165	179	167
Typhoid fever	—	—	—	3	4	4
Typhus (all forms)	—	—	—	—	1	—

(a) Figures exclude cases where the original diagnosis was subsequently disproved. No cases of plague, smallpox or yellow fever were notified during the period. (b) Contracted out of State.

The Commissioner of Public Health may compel any person believed to be suffering from venereal disease to undergo examination by a medical practitioner. Any person who is aware or suspects that he is suffering from venereal disease is required to consult a medical practitioner and, if found to be infected, must continue treatment until a certificate of cure is issued. Free treatment is available at public hospitals. In 1980, 1,215 (1979, 1,203) cases of gonorrhoea and 179 (1979, 230) of syphilis were notified to the Department.

The State Government conducts a tuberculosis control programme throughout the State. This includes the provision of services for diagnosis and treatment as well as preventive measures. Under the *Health Act 1911-1979*, all persons in Western Australia may be required to undergo X-ray examinations, which are conducted by mobile units of the Chest and Tuberculosis Services and at the Perth and Fremantle Chest Clinics.

### Health Services for Children

In addition to measures provided for immunisation against infectious diseases, the Community and Child Health Services and Dental Health Services assist in maintaining the general health of children in Western Australia.

Child Health Centres have been established throughout the State to advise mothers concerning the care of infants and pre-school children. Screening services for detecting metabolic, hearing, visual and other physical or behavioural disorders are available. Expectant parents are offered a variety of education programmes, and mothers are visited in hospital. It is estimated that over 90 per cent of infants in the State are taken to a Centre at least once in the first year of life. Child Health Sisters also visit remote areas of the State, and interview mothers who are normally dependent on advice given by correspondence.

#### CHILD HEALTH CENTRES

Particulars		1975	1976	1977	1978	1979	1980
<b>Expenditure (a) (b)</b>							
Salaries and wages	\$'000	1,114	1,218	2,515	2,925	r 1,854	1,984
Other	\$'000	151	180	361	402	r 254	270
Total	\$'000	1,265	1,398	2,876	3,327	r 2,109	2,254
<b>Number of —</b>							
<b>Staff (c) —</b>							
Medical officers		2	2	1	2	2	2
Nurses		117	120	122	139	141	147
Total		119	122	123	141	143	149
Child health centres (c)		93	205	207	208	208	221
Mobile clinics (c)		5	7	7	7	7	6
Total		98	212	214	215	215	227
<b>Attendances at centres —</b>							
Individual infants		46,359	46,240	47,752	49,544	51,172	54,295
Total attendances		263,163	274,535	276,787	287,742	289,624	296,884
Home visits by nurses		37,641	40,100	40,636	40,310	36,862	36,243

(a) Year ended 30 June. (b) Includes the School Health Section for the years 1975 to 1978. (c) At 31 December.

The School Health Section of the Community and Child Health Services provides a complete health appraisal of each child during the first year at pre-school, day-care centre or school. Subsequent screening for visual and hearing problems is carried out on two further occasions during school life. School Health Nurses are based at high schools and other groups of schools and provide counselling, first aid and health education services in addition to screening.

Medical assessment by multi-disciplinary teams is offered for children with physical, mental or learning handicaps and is available on the request of either teacher, guidance officer or parent. The Child Development Centre offers similar services at specialist level for handicapped children.

The Community Health Section offers preventive health services to disadvantaged groups within the community. This Section has brought a much higher standard of both preventive and therapeutic health care to children of the Aboriginal community and other minority groups through collaboration with the Child Health and School Health Sections, and with hospitals throughout the State.

Under the School Dental Services scheme preventive dentistry centres, staffed by school dental therapists trained at the Public Health Department's School of Dental Therapy, are progressively being established throughout the State. Dental therapists, under the direction of dental officers, also provide free dental care for pre-school and primary school children, and in country areas not served by private practitioners school dental officers provide a service for adults as well as for children.

## OTHER HEALTH SERVICES

**Quarantine**

The *Quarantine Act* 1908 provides for the quarantine of humans, animals and plants. Human quarantine is concerned primarily with the procedures necessary to exclude quarantinable diseases, namely smallpox, plague, cholera, yellow fever, typhus fever, lassa fever, Marburg virus disease and such other diseases as may be declared under the Quarantine Act. Animal quarantine regulates the importation of animals and animal products from overseas, and plant quarantine the importation of all plants and plant products, with the object of excluding plant diseases, insect pests and weeds. In respect of interstate movements of animals and plants, the Quarantine Act becomes operative only when it is considered that Commonwealth Government action is necessary for the protection of any State or States, and in general the control of interstate movements of animals and plants is the responsibility of State Governments. The administration of the Quarantine Act is a function of the Commonwealth Department of Health.

**Royal Flying Doctor Service of Australia**

The Royal Flying Doctor Service of Australia is a non-profit organisation financed by grants from the Commonwealth and State Governments and by private donations. The principal function of the Service is to provide aerial medical services for residents in remote areas. Isolated townships, mining centres and sheep and cattle stations are usually equipped with two-way radio sets and, by this means, are linked with bases where doctors are available for radio consultation in the event of sickness or accident. In serious cases a doctor flies to the patient, who may then be flown to hospital for treatment. The Service provides, through the Commonwealth Department of Health, standard medical chests with directions for the use of the drugs and medical supplies which they contain.

The radio network of the Royal Flying Doctor Service is regularly used in the work of Schools of the Air conducted by the Education Department, and also for the transmission and receipt of telegrams. In addition, it may be used, as the need arises, in connection with flood relief, in searching for lost parties and during cyclones.

The following table gives particulars of the operations of the Western Australian Section of the Service during the six years ended June 1980.

ROYAL FLYING DOCTOR SERVICE OF AUSTRALIA  
OPERATIONS OF WESTERN AUSTRALIAN SECTION

Particulars		1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Expenditure (operational)	\$'000	591	796	1,086	1,454	1,828	2,359
Number of —							
Medical flights		1,333	1,477	1,693	1,988	2,427	2,107
Miles flown		803,686	969,356	1,019,094	1,219,562	1,431,275	1,168,827
Patients transported		2,467	2,745	2,787	3,302	4,570	3,758
Patients attended		13,991	15,825	16,021	16,578	18,046	11,619
Radio and telephone consultations		1,676	1,761	1,812	1,033	1,116	1,108

**The St John Ambulance Association**

The St John Ambulance Association is responsible for the road ambulance service and for teaching first aid throughout Western Australia. The Association also co-operates closely with the Royal Flying Doctor Service in transporting patients by air throughout the State.

The Association is a non-profit organisation. The main sources of finance are charges on users of the service, members' contributions to the Ambulance Benefit Fund, donations by individuals, and grants from the State Government and the Lotteries Commission.

The Perth Metropolitan district and larger country towns have ambulances manned by paid ambulance officers. Smaller country towns are serviced by volunteer officers. Ambulance

officers are trained to give emergency care and life support to people who are seriously ill or injured and to provide nursing care when transporting patients to hospitals and medical centres.

First aid courses, taught by paid and voluntary staff, are provided by the Association. Emphasis is laid on practical involvement of students. The Medic Alert Foundation is administered and serviced by the Association in Western Australia. Medic Alert provides a service which ensures that persons who have a medical problem receive appropriate treatment in the event of accident or collapse.

The following table gives particulars of The St John Ambulance Association for the years ended December 1976, 1977 and 1978 and the year ended 30 June 1980.

THE ST JOHN AMBULANCE ASSOCIATION  
WESTERN AUSTRALIA

Particulars	1976	1977	1978	1979-80
Ambulance service, Perth —				
Patient calls	32,452	33,656	36,882	40,373
Kilometres travelled	766,275	792,477	873,451	997,213
First aid classes —				
Certificates issued	6,311	7,398	7,370	6,576

### Miscellaneous Health Services

Other expenditure by the Commonwealth Government on health services includes the cost of district health laboratory services, the free supply of certain prophylactic materials and biological products (e.g. poliomyelitis vaccine), the supply and maintenance of hearing aids for children and pensioners, subsidies to various voluntary organisations conducting home nursing services that are assisted by the State Governments or local government authorities, the supply of artificially produced radio-active isotopes to private medical practitioners and hospitals for medical treatment purposes, and expenses in connection with the blood fractionation plant of the Commonwealth Serum Laboratories.

## HOSPITALS OTHER THAN MENTAL HOSPITALS

### Commonwealth Government Hospitals

The Repatriation General Hospital at Hollywood and the Edward Millen Hospital at Victoria Park provide free treatment for certain recipients of pensions payable under the Repatriation Act and for their dependants. Free treatment is also available to some other categories of former members of the defence forces and their dependants.

### State Government and Government-assisted Hospitals

The *Hospitals Act 1927-1980* is administered, subject to the direction of the Minister for Health, by the Hospital and Allied Services Department. For administrative purposes, a hospital under the direct control of this Department is classified as 'departmental' and is financed from State funds. A hospital classified as a 'Board' hospital has its own board of management and is subsidised by the State Government.

The principal government and government-assisted hospitals in the metropolitan area are the Royal Perth Hospital, Fremantle Hospital, Sir Charles Gairdner Hospital, King Edward Memorial Hospital for Women, Princess Margaret Hospital for Children, the Homes of Peace for the Chronic Sick, the Perth Dental Hospital, and Mount Henry Hospital and Sunset Hospital for long-term patients. Outside the metropolitan area the principal hospitals are located in the regional centres of Albany, Bunbury, Carnarvon, Derby, Geraldton, Kalgoorlie, Narrogin, Northam and Port Hedland.

Details of the activities of departmental and Board hospitals during the six years ended 30 June 1980 are given in the following table.



## DEPARTMENTAL AND BOARD HOSPITALS (a)

Particulars		1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Expenditure —							
Capital funds	\$'000	26,756	33,938	34,652	34,220	41,368	40,623
Hospital Fund —							
Establishment and domestic (b)	\$'000	15,583	21,765	26,264	29,496	26,893	28,382
Salaries and wages	\$'000	110,632	139,707	166,057	187,282	203,170	227,193
Other	\$'000	30,815	52,620	67,191	72,430	88,119	102,113
Tuberculosis	\$'000	873	1,160	—	—	—	—
Total	\$'000	184,660	249,191	294,164	323,428	359,550	398,311
Number of —							
Hospitals (c) —							
Departmental		49	50	49	49	49	50
Board		55	57	58	58	58	57
Total		104	107	107	107	107	107
Beds (d) —							
Departmental		3,382	3,400	3,567	3,573	3,479	3,429
Board		4,458	4,584	4,614	4,603	4,681	4,639
Total		7,840	7,984	8,181	8,176	8,160	8,068
Staff (c) —							
Medical		625	759	843	842	886	915
Nursing		6,986	7,339	7,717	7,870	7,977	8,228
Other		7,546	7,809	8,246	8,783	8,992	8,833
Total		15,157	15,907	16,806	17,495	17,855	17,976
In-patients —							
At beginning of year		5,433	5,706	6,235	6,153	5,913	5,735
Admissions		194,412	206,550	217,667	r 229,074	232,095	235,544
Discharges		190,798	202,581	214,408	r 225,959	228,549	231,288
Deaths		3,341	3,440	3,341	3,355	3,724	3,903
At end of year		5,706	6,235	6,153	5,913	5,735	6,088
Average daily number resident		5,498	5,716	5,731	5,827	5,924	5,981
Out-patients —							
Individuals		665,398	818,752	1,002,010	n.a.	n.a.	n.a.
Treatments		1,465,253	1,731,752	1,766,256	2,707,298	2,948,781	2,980,340

(a) Includes particulars of the Perth Dental Hospital, and Mount Henry Hospital and Sunset Hospital for long-term patients. (b) Maintenance of equipment, furnishings and minor repairs. (c) At 30 June. (d) At 31 July.

As previously indicated, the control of tuberculosis is carried out under the direction of the Commissioner of Public Health. The principal institution for the treatment of tuberculosis is the Sir Charles Gairdner Hospital at Nedlands.

Leprosy, which is confined almost entirely to the far north of the State, is treated at a leprosarium at Derby in the Kimberley Division.

### Private Hospitals and Nursing Homes

In addition to the government hospitals there are a number of private general and maternity hospitals, which are registered and inspected by the Department of Public Health. The principal private hospitals are those established by religious bodies in the metropolitan area and the main country towns. These include the Hospitals of Saint John of God at Subiaco, Rivervale, Bunbury and Geraldton; Saint Anne's, Mount Lawley; Bethesda Hospital, Claremont and Saint Joseph's Hospital, Bicton.

At 1 January 1981 there were 120 private hospitals and nursing homes in Western Australia with a total bed capacity of 6,094 at that date.

### MENTAL HEALTH SERVICES

The *Mental Health Act 1962-1979*, which consolidates and amends the law relating to the treatment of mental disorders, came into operation on 1 July 1966. The Mental Health Services established under the Act are administered, subject to the control of the Minister for Health, by the Director of Mental Health Services. The Director must be a psychiatrist and is appointed by the Governor. Institutions authorised by the Act include approved hospitals for the treatment of mental illness, out-patient and child guidance clinics, day care facilities, training centres,

hostels, sheltered workshops and domiciliary services for psychiatric patients and for the intellectually handicapped.

The Act provides for the admission of patients to hospitals approved for the purpose, either on referral by a medical practitioner or by order of a Justice of the Peace supported by the referral of a medical practitioner. A person so received into a hospital must be examined within seventy-two hours by the superintendent or another psychiatrist, and admission as a patient is dependent upon the result of the examination. Unless found to be in need of treatment, the person is required to leave the hospital. Special provisions exist for the detention for observation or treatment of persons admitted by order of a court or from a prison. The Act also provides for voluntary admissions. A person not less than eighteen years of age may be granted admission on his own request. Younger persons may be admitted on the application of a parent or guardian.

The following table shows particulars concerning the various mental health service units operated by the Mental Health Services authority during the year ended 30 June 1980.

MENTAL HEALTH SERVICES — YEAR ENDED 30 JUNE 1980

Particulars		Approved psychiatric hospitals	Psychiatric outpatient and day patient facilities (a)	Other psychiatric residential units	Intellectually handicapped residential units	Intellectually handicapped outpatient and day patient facilities (b)	Rehabili- tation units	Central services
Expenditure —								
j Salaries and wages	\$'000	16,666	1,968	651	10,664	2,419	997	4,769
Other	\$'000	3,778	343	148	1,799	322	277	983
Total	\$'000	20,444	2,311	799	12,463	2,741	1,274	5,752
Number of (c) —								
Units		4	16	2	21	15	2	..
Beds		964	—	103	611	—	—	..
Staff —								
Medical		34	21	—	1	12	—	3
Nursing		727	40	27	704	41	3	20
Other		654	78	22	287	115	74	415
Total		1,415	139	49	992	168	77	438
Patients at beginning of year		1,893	—	97	530	—	—	..
Admissions		1,738	—	60	1,403	—	—	..
Discharges (d)		1,753	—	65	1,372	—	—	..
Patients at end of year		1,878	—	92	561	—	—	..
Attendances		—	90,437	—	—	32,721	99,390	..
Persons attending		—	9,030	—	—	1,465	725	..

(a) Expenditure figures only include details for the Creative Expression Unit. See also footnote (b). (b) Includes details (other than expenditure) for the Creative Expression Unit. See also footnote (a). (c) At 30 June. (d) Includes deaths.

Except in the case of a person admitted by order of a court or from a prison, a patient may be released on leave or discharged by the hospital superintendent. A Board of Visitors or the Supreme Court of Western Australia may also, after due consideration, order the release of a patient. Where application for the discharge of a voluntary patient is made either by the patient himself or, in the case of a patient under the age of eighteen years, by the parent or guardian at whose request the patient was admitted, he must be discharged within seventy-two hours.

Establishments designated as approved hospitals within the meaning of the Act are Graylands Hospital, Swanbourne Hospital, Lemnos Hospital and Heathcote Hospital.

The Commonwealth Government is empowered by the *Mental Health and Related Services Assistance Act 1973* to provide financial assistance to States, local governing bodies and voluntary organisations in respect of services or facilities in relation to mental illness, mental disability, alcoholism and drug dependence. The Act came into operation on 27 November 1973 replacing the *States Grants (Mental Health Institutions) Act 1964* which expired on 30 June 1973.

## CARE OF AGED AND DISABLED PERSONS

Part 4 of this Chapter gives particulars of pensions, allowances and some other benefits available to aged and disabled persons under the provisions of the Social Services Act and the Repatriation Act. Forms of assistance extended to such persons by other Commonwealth Acts are dealt with below.

**Aged or Disabled Persons Homes Act**

The *Aged or Disabled Persons Homes Act 1954* incorporates the *Aged Persons Homes Act 1954* and extends its provisions to include disabled persons. The purpose of the legislation is to enable the Commonwealth Government to give financial assistance to religious, charitable and other organisations in providing accommodation for the aged or disabled. The Act is administered, subject to any directions of the Minister, by the Director-General of Social Security.

AGED OR DISABLED PERSONS HOMES GRANTS  
WESTERN AUSTRALIA

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Grants approved (a) — Number	32	5	7	14	5	15
Persons accommodated — Type of accommodation —						
Self-contained	511	108	36	72	20	82
Hostel	183	—	—	10	50	68
Nursing	96	—	85	—	—	45
Total persons	790	108	121	82	70	195
Amount \$'000	7,431	1,335	1,933	978	1,100	2,073

(a) A supplementary grant may be approved in a year subsequent to the year when the original grant was approved. In this table each supplementary grant has been included in the year in which the additional amount was actually approved.

For the purposes of the Act, the term 'aged person' means a man aged sixty-five years or over or a woman aged sixty years or over and includes the spouse of the aged person; 'disabled person' means a person who has attained the age of sixteen years and who is permanently blind or permanently incapacitated for work but does not include the spouse of that person unless the spouse is also disabled. Grants are made to organisations 'to encourage and assist the provision of suitable homes for eligible persons, and in particular homes at which eligible persons may reside in conditions approaching as nearly as possible normal domestic life . . .'. The legislation authorises grants to eligible organisations to be applied towards the cost of erecting or purchasing approved homes to be used permanently for the accommodation of aged or disabled persons. To be eligible for assistance an organisation must be one which is carried on otherwise than for the purpose of profit or gain to its individual members, and may be a religious, charitable or benevolent organisation, an organisation of former members of the defence forces, an organisation approved by the Governor-General, or a local governing body. An organisation conducted or controlled by the Commonwealth Government or a State Government is not eligible for assistance. Grants are made from moneys appropriated by the Parliament from the Consolidated Revenue Fund and from 20 May 1976 were made on the basis of \$2 for each \$1 raised by the organisation. There is a maximum subsidy limit based on the number of persons to be housed in the new accommodation.

On 20 May 1976 the Commonwealth Government announced a three-year programme to provide funds for the establishment of accommodation for eligible persons. The programme is designed to give organisations, where projects have been approved, the opportunity to proceed with planning, and in some instances construction, on the basis of a forward subsidy commitment by the Government. On 18 December 1979 the Government announced an extension of the programme for a further three years commencing on 1 July 1980.

**Personal Care Subsidy.** An amendment to the Aged Persons Homes Act operative from 10 October 1969 provided for payment of a Personal Care Subsidy to approved homes in respect of residents eighty years of age or over. A further amendment in December 1974, extended the subsidy to certain residents who had not attained eighty years of age. Homes eligible for the subsidy are those where residents are provided with all meals and where staff is employed to assist residents who need help with bathing, dressing, personal laundry and the cleaning of their rooms, and those who need help with medication.

The *Aged or Disabled Persons Homes Act 1954* authorises the payment of subsidy at the rate of \$15 per week in respect of each person residing in approved premises who has attained the age of eighty years or is receiving approved personal care services. Payments are made from the National Welfare Fund.

#### PERSONAL CARE SUBSIDY — WESTERN AUSTRALIA

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Number of approved premises (a)	52	55	61	63	68	69
Number of qualified residents (a)	1,267	1,478	1,801	1,906	1,966	2,726
Amount of subsidy paid	\$'000	883	1,160	1,402	1,630	1,800

(a) At 30 June.

#### Homeless Persons Assistance Act

The *Homeless Persons Assistance Act 1974*, which came into operation on 13 December 1974, authorises the Commonwealth Government to make grants to charitable and other organisations providing temporary accommodation and personal services for the homeless. Grants may be made in respect of the acquisition of land, buildings and furniture; the rent of premises; the salaries of social welfare workers (including social workers, welfare officers, psychologists and occupational therapists); and the provision of accommodation and meals.

The homeless persons assistance programme was reviewed after its initial three years (the prescribed period in the Act) and was subsequently extended on two occasions.

The *Homeless Persons Assistance Amendment Act 1979* which received assent on 19 November 1979 removed all reference to a prescribed period in the principal legislation and effectively secured the future of the programme.

The following table gives particulars of grants made to organisations in Western Australia in the period to 30 June 1980.

#### HOMELESS PERSONS ASSISTANCE GRANTS WESTERN AUSTRALIA

Particulars	1974-75 (a)	1975-76	1976-77	1977-78	1978-79	1979-80
	\$	\$	\$	\$	\$	\$
Building projects	9,660	60,092	57,280	483,997	63,212	9,549
Rent of premises	2,730	11,787	29,916	42,908	46,325	48,216
Furniture and equipment	20,301	3,162	26,492	5,651	7,738	4,927
Staff salaries	..	5,459	11,566	18,254	23,518	32,399
Food and accommodation	11,550	33,506	39,784	58,797	69,331	78,498
Meals for non-residents	2,418	7,620	10,869	11,124	17,123	19,507
Total	46,659	121,626	175,907	620,731	227,247	193,096

(a) Part year only.

#### Aged Persons Hostels Act

The *Aged Persons Hostels Act 1972* is administered, subject to any directions of the Minister, by the Director-General of Social Security. The Act authorises the Commonwealth Government to assist in the provision of additional hostel-type accommodation for aged persons by making grants to organisations which satisfy certain conditions related to existing accommodation. The first grants in respect of organisations in Western Australia were approved during the year ended 30 June 1974. The Act expired on 27 November 1975 but amendments allowed an extension of time for the completion of projects approved in

principle. No new grants were made in 1975-76 but capital grants totalling \$338,435 were provided in that year in respect of projects approved in 1974-75. The *Aged Persons Hostels Amendment Act* 1976, which came into operation on 20 September 1976 preserves the rights of organisations which had been accepted during the time period of the original Act but had been deferred during 1975-76.

#### AGED PERSONS HOSTELS GRANTS WESTERN AUSTRALIA

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Number of grants	4	—	10	5	1	4
Persons accommodated —						
Hostel beds	93	—	168	129	8	91
Staff beds	9	—	9	6	—	4
Total	102	—	177	135	8	95
	\$	\$	\$	\$	\$	\$
Amount of grants —						
Capital grants	1,315,090	(a) 338,435	2,944,883	2,297,992	201,535	1,571,316
Furnishing grants	25,500	—	44,250	36,750	2,000	23,750
Total	1,340,590	338,435	2,989,133	2,334,742	203,535	1,595,066

(a) Approved in 1974-75.

#### Delivered Meals Subsidy Act

The *Delivered Meals Subsidy Act* 1970 is administered, subject to any directions of the Minister, by the Director-General of Social Security. Its purpose is to enable help to be given to approved organisations to establish, maintain, expand and improve services for the delivery of meals to aged and invalid persons. To qualify for approval, an organisation must conduct a regular service delivering meals wholly or mainly to aged or invalid persons in their homes.

The Act authorises payment of subsidy at the rate of 25 cents per meal, which is increased to 30 cents if the meal includes fresh fruit or fruit juice. Payments are made from the National Welfare Fund.

#### Handicapped Persons Assistance Act

The *Handicapped Persons Assistance Act* 1974, which repealed the *Handicapped Children (Assistance) Act* 1970 and parts of the *Sheltered Employment (Assistance) Act* 1967 consolidates and extends the Commonwealth Government's programmes of assistance to voluntary organisations concerned with the welfare of handicapped persons. The Act is administered, subject to any directions of the Minister, by the Director-General of Social Security.

The Act provides that grants may be made to eligible organisations which are deemed by the Minister to provide 'prescribed services' for disabled persons. Prescribed services which may be approved for the purposes of the Act include training, activity therapy, sheltered employment, residential accommodation, holiday accommodation, recreational facilities and rehabilitational facilities. Assistance may be provided towards meeting the cost of purchase or construction of premises to provide the prescribed services. The Act allows the payment of subsidy in respect of residential accommodation to be extended to include accommodation for disabled persons capable of engaging in normal employment. Subsidies may also be approved to help meet expenditure on building maintenance, rental of premises, equipment, and the salaries of certain staff involved in providing prescribed services. The Act also authorises the payment to organisations of a training fee for each person who, after being employed for six months or longer in a sheltered workshop, has spent at least twelve months in normal employment.

On 7 November 1976 the Minister for Social Security announced details of a Commonwealth three-year programme designed to provide new facilities for mentally and physically handicapped people, and to provide continuing support for existing facilities. An extension of this programme for a further three years was announced in January 1980.

The handicapped children's benefit, formerly payable in terms of the National Health Act, is continued under the provisions of the *Handicapped Persons Assistance Act* 1974. A handicapped child is defined as a person under sixteen years of age who is suffering from a physical or mental disability. An eligible organisation which provides approved residential accommodation for handicapped children is entitled to receive benefit in respect of each such child at the rate of \$5.00 for each day on which accommodation is provided for the child.

The following table shows the value of grants approved during the five years ended 30 June 1980.

HANDICAPPED PERSONS ASSISTANCE GRANTS — ANNUAL EXPENDITURE  
WESTERN AUSTRALIA  
(\$)

Particulars	1975-76	1976-77	1977-78	1978-79	1979-80
Grants approved for —					
Residential accommodation	168,667	93,809	357,914	1,678,409	183,840
Non-residential buildings	780,652	640,527	164,270	62,332	83,779
Equipment	488,643	466,490	259,230	367,972	221,132
Maintenance	23,740	3,665	2,080	90,733	35,781
Training fee	—	4,500	500	2,000	—
Salary subsidy	1,595,399	2,232,948	2,403,530	2,841,511	3,191,865
Rent	33,189	29,561	59,366	90,733	82,097
Total	3,090,290	3,471,500	3,246,890	5,133,690	3,798,494

### Sheltered Employment Allowances

Sheltered employment allowances, which were introduced in terms of the *Social Services Act* 1967, enable invalid pensioners and certain other disabled persons to earn an income from sheltered employment and at the same time to be eligible to receive a special allowance which, in the case of an invalid pensioner, replaces the pension.

### Other Forms of Assistance

The *States Grants (Paramedical Services) Act* 1969 authorises the Commonwealth Government to share with a State on a \$1 for \$1 basis the cost of approved paramedical services, such as chiropody, occupational therapy, physiotherapy and speech therapy, provided wholly or mainly for aged persons in their homes. Payments are made from the Consolidated Revenue Fund and the maximum annual expenditure authorised by the Act is \$250,000, of which \$19,000 is payable to Western Australia. In the period to 30 June 1981, no grant had been made to Western Australia.

Under the *State Grants (Home Care) Act* 1969 the Commonwealth Government shares with a State on a \$2 for \$1 basis the cost of approved housekeeping or other domestic services provided wholly or mainly for aged persons in their homes. It also shares with a State the cost of providing approved senior citizens' centres, on a \$2 for \$1 basis up to a maximum of two-thirds of the capital cost of the centres, as well as paying half of the salary of a welfare officer engaged in the co-ordination of home care services and associated with a senior citizen's centre. Grants to Western Australia were first made in the year 1970-71.

The following table shows particulars of grants made during the six years ended 30 June 1980.

HOME CARE SERVICES GRANTS — WESTERN AUSTRALIA

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
	\$	\$	\$	\$	\$	\$
Amount of grants paid for —						
Home care services	115,981	84,817	57,333	56,000	43,667	52,250
Senior citizens' centres	28,206	343,855	406,400	348,473	99,864	174,034
Welfare officers	14,865	41,831	56,199	55,990	65,171	69,953
Total	159,052	470,503	519,932	460,463	208,702	296,237

## Chapter V— continued

### Part 4 — Social Benefits, Pensions and Welfare Services

The conditions relating to payment of the several benefits dealt with in this Part are described as they existed at 1 January 1981. The information given is intended to serve only as a general guide to the main provisions relating to social security and repatriation benefits provided by the Commonwealth Government and relief payments made by the State Government. Information relating to health services and benefits is shown in Part 3. The Commonwealth Government's social security programme is designed to provide protection against economic hardship caused by loss of earnings which results from age, temporary illness, permanent disability or unemployment. It also makes provision for lack of financial support owing to the absence of a supporting male through death, desertion or long-term separation, and for the necessity of a lone male parent to forgo employment in order to care for a child. Another aim of the system is to help parents with expenses associated with the rearing of children. It is designed also to compensate veterans for disabilities caused by war service and to assist the dependants of those who died as a result of war service.

This assistance may take the form of (a) financial aid to or for institutions, organisations or authorities or (b) regular cash payments to or on behalf of individuals, which may be either selective benefits (i.e. subject to an income test) such as age and invalid pensions and widows' pensions, or universal benefits (i.e. free of income test). In addition, there is provision for a wide range of welfare services for people with special needs (e.g. invalids and other persons may be trained so that they can re-enter paid employment).

Pensions and other benefits provided under the Social Services Act and health services provided under the National Health Act are financed from the National Welfare Fund. Other payments from the fund include allowances to sufferers from tuberculosis. The fund receives each year by transfer from the Consolidated Revenue Fund an amount equal to the payments made. Other income of the National Welfare Fund is derived from interest on investments. Details of expenditure in Western Australia since the fund was established in 1943 are given in the *Statistical Summary* following Chapter X.

Disability pensions, service pensions, and allowances provided under the Repatriation Act and services provided under the Health Insurance Act are financed from the Consolidated Revenue Fund.

The State Government makes certain payments for the relief of persons in necessitous circumstances which in most cases supplement benefits provided by the Commonwealth Government (see text *State Relief Payments* near the end of this Part).

#### BENEFITS PAYABLE UNDER SOCIAL SERVICES ACT

##### Rates of Benefit

The following table shows the maximum weekly rates applying to age and invalid pensions, sheltered employment allowances, widows' pensions, supporting parents' benefits, and unemployment and sickness benefits. The rates shown apply also to service pensions.

## MAXIMUM WEEKLY RATES OF BENEFIT

	Rate current at —					
	November 1977	May 1978	November 1978	November 1979	May 1980	November 1980
Pension, benefit or allowance						
Single (i.e. unmarried) rate —						
Aged 16 or 17 years (a)	36.00	36.00	36.00	36.00	36.00	36.00
Aged 18 years or more	49.30	51.45	53.20	57.90	61.05	64.10
Married rate (combined)	82.20	85.80	88.70	96.50	101.70	106.80
Each dependent child, including student child	7.50	7.50	7.50	7.50	7.50	10.00
Guardian's (or mother's) allowance (b) —						
Where there is a child aged under 6 years or an invalid child requiring full-time care	6.00	6.00	6.00	6.00	6.00	8.00
Other cases	4.00	4.00	4.00	4.00	4.00	6.00
Supplementary assistance (c)	5.00	5.00	5.00	5.00	5.00	5.00

(a) Rate applies to recipients of unemployment and sickness benefits only. (b) Guardian's allowance payable to unmarried pensioner recipient of sheltered employment allowance having the care of one or more dependent children, including student children. Mother's allowance payable to Class A widow pensioner or recipient of supporting parent's benefit. (c) Payable where pensioner or beneficiary is wholly or substantially dependent on the pension or benefit and is paying rent or lodging charges.

## Age and Invalid Pensions and Allowances

## AGE AND INVALID PENSIONS — WESTERN AUSTRALIA

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Number of pensioners at 30 June —						
Age —						
Males	26,489	28,282	29,127	32,578	33,491	34,320
Females	53,342	55,805	57,343	61,913	63,067	64,567
Wives of age pensioners	2,268	2,460	2,500	2,656	2,773	2,813
Persons	82,099	86,547	88,970	97,147	99,331	101,700
Invalid —						
Males	6,676	7,730	8,674	9,076	10,264	10,941
Females	4,285	4,535	4,589	4,577	4,781	4,953
Wives of invalid pensioners	1,854	2,586	3,493	3,139	3,787	4,163
Persons	12,815	14,857	16,756	16,792	18,832	20,057
\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Amount paid during year (a) —						
Age pensions	118,492	156,447	183,519	216,111	238,241	258,650
Invalid pensions	20,320	27,066	33,666	39,321	46,592	54,228
Total	138,812	183,513	217,185	255,432	284,833	312,878

(a) Includes amounts paid to benevolent homes for maintenance of pensioners and to pensioner inmates of these homes. Includes also allowances and supplementary assistance.

**Age Pensions.** Age pensions are payable, subject to residence qualification and an income test, to women aged sixty years or more and men aged sixty-five years or more. A period of ten years continuous residence is usually necessary. The income test does not apply to persons aged seventy years or more, although payment at a rate higher than the May 1978 level for these persons is subject to an income test.

A wife's pension, subject to an income test, is payable to the wife of an age pensioner if she is not eligible for an age, invalid or service pension in her own right.

Additional payments are made to pensioners with dependent children. These additional payments are subject to an income test. Supplementary assistance is payable, subject to a special income test, to pensioners who are required to pay rent, lodging or board and lodging charges. On the death of one of a married pensioner couple, the surviving member may become entitled to receive, for up to six fortnightly instalments, the equivalent of the two pensions that would have been paid if the spouse had not died. Single age pensioners with a dependent child or children are also eligible for guardian's allowance (in place of mother's allowance).

**Invalid Pensions.** Invalid pensions are payable to persons aged not less than sixteen years who, while resident in Australia, become either permanently incapacitated for work to the extent of at least 85 per cent or permanently blind. Pensions are subject to an income test except in the case



of those who are permanently blind. No qualifying period of residence in Australia is necessary unless the incapacity occurred outside Australia, in which case the residence qualification is the same as that for an age pension.

A wife's pension is payable to the wife of an invalid pensioner if she is not eligible for age pension, invalid pension or service pension in her own right. Invalid pensioners are eligible for the same additional payments as age pensioners and the rates of benefit are the same.

### Sheltered Employment Allowances

Sheltered employment allowances are payable to disabled persons who are qualified to receive an invalid pension or who would become so qualified if they ceased to be provided with sheltered employment. The allowance is subject to the same means test as that which applies to the invalid pension, and the rates of benefit are the same.

Details of sheltered employment allowances for the six years ended 1979-80 are given in the following table.

#### SHELTERED EMPLOYMENT ALLOWANCES — WESTERN AUSTRALIA

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Number of (a) —						
Workshops paying allowances	11	11	12	11	11	11
Employees receiving allowances	432	420	481	504	642	699
Expenditure on allowances \$'000	575	980	1,250	1,493	1,765	1,997

(a) At 30 June.

### Funeral Benefits

A funeral benefit up to a maximum of \$20 is payable to any person liable for the funeral costs of an age or invalid pensioner. The deceased must have been in possession of or eligible for a pensioner health benefit card. A higher benefit, up to a maximum of \$40 is payable to an age, invalid or widow pensioner liable for the funeral costs of a spouse, a child or another such pensioner. Only pensioners in possession of or eligible for a health benefit card can claim this benefit.

### Widows' Pensions and Allowances

Pensions are payable to widows, subject to an income test. No period of residence is necessary if a woman and her husband were residing permanently in Australia when she became a widow. In other cases, five years' continuous residence immediately preceding lodgment of claim is necessary but this requirement is waived in the case of a woman widowed overseas who returns to Australia, provided she had resided continuously in Australia for ten years at any time.

#### WIDOWS' PENSIONS — WESTERN AUSTRALIA

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Number of pensions current at 30 June —						
Class A pensioners	4,930	5,058	5,230	5,535	5,921	5,942
Class B pensioners	4,493	4,957	5,442	5,948	6,301	6,524
Class C pensioners	19	12	19	11	10	10
Total	9,442	10,027	10,691	11,494	12,232	12,476
Amount paid during year (a) \$'000	18,459	24,809	27,700	32,290	36,329	40,647

(a) Includes allowances and supplementary assistance.

There are three classes of widow pensioners: Class A — a widow with one or more dependent children in her care; Class B — a widow without dependent children who is at least fifty years of age, or is not less than forty-five years of age when her Class A pension ceases because she no longer has a dependent child in her care; and Class C — a widow under fifty years of age without dependent children who is in necessitous circumstances at the time of her husband's death or within twenty-six weeks thereafter. For all classes, the term 'widow' includes a woman who was the common-law wife of a man for at least three years immediately

before his death. For Classes A and B, the term includes a wife who has been deserted for six months, a divorcee, or a woman whose husband has been imprisoned for six months.

Widow pensioners are eligible for supplementary assistance, additional payments for dependent children, and mother's allowance (in place of guardian's allowance) at the same rates and subject to the same conditions as age and invalid pensioners.

### Supporting Parent's Benefit

The supporting parent's benefit is designed to assist an unmarried parent or a parent who is a separated *de facto* husband or wife, *de facto* husband or wife of a prisoner, a separated husband or wife, or a sole parent supporting a child for any other reason.

### Unemployment, Sickness and Special Benefits

Unemployment and sickness benefits are available, subject to a means test, to persons who have suffered loss of income because they are unemployed or are temporarily incapacitated for work. There is a waiting period of seven days before benefits are paid. Where a claimant for unemployment benefit does not lodge a claim immediately after becoming unemployed, the waiting period of seven days may commence in the week before the claim is made if the Director-General is satisfied that for each day in that week the person was capable of undertaking and willing to undertake suitable work and had taken reasonable steps to obtain work. A special benefit may be paid in the waiting period of seven days if the claimant is suffering hardship or in certain cases payment of unemployment benefit can be advanced.

A special benefit may be paid to a person ineligible for a pension or for an unemployment or sickness benefit, if he is unable to earn a sufficient livelihood for himself and his dependants and is suffering hardship.

#### UNEMPLOYMENT, SICKNESS AND SPECIAL BENEFITS — WESTERN AUSTRALIA

Particulars	1974-75	1975-76	1976-77	1977-78 (a)	1978-79	1979-80
<b>Unemployment benefit —</b>						
Number admitted to benefit during year	69,285	84,625	75,059	85,822	94,500	(b) 88,700
Average number on benefit at end of each week	9,317	13,598	15,706	20,470	29,000	(b) 29,800
Number on benefit at end of year —						
Males	6,802	9,499	12,895	17,934	20,700	20,589
Females	4,209	5,055	6,047	7,686	9,300	9,506
Persons	11,011	14,554	18,942	25,620	30,000	30,095
<b>Sickness benefit —</b>						
Number admitted to benefit during year	12,004	15,211	14,589	13,582	12,200	(b) 13,200
Average number on benefit at end of each week	1,766	2,034	2,388	2,487	2,400	(b) 2,700
Number on benefit at end of year —						
Males	1,531	1,838	2,063	2,007	1,900	2,332
Females	319	481	487	497	500	743
Persons	1,850	2,319	2,550	2,504	2,400	3,075
<b>Special benefit (c) —</b>						
Number admitted to benefit during year	1,591	4,261	3,782	4,306	5,300	(b) 6,850
Average number on benefit at end of each week	408	529	536	670	900	(b) 1,400
Number on benefit at end of year —						
Males	92	163	251	304	500	990
Females	359	343	346	373	600	821
Persons	451	506	597	677	1,100	1,811
<b>Benefits paid (d) during year —</b>						
Unemployment	\$'000 19,753	\$'000 33,824	\$'000 42,958	\$'000 59,324	\$'000 82,842	\$'000 87,402
Sickness (e)	4,415	6,190	6,814	7,585	7,200	8,676
Special (c)	776	1,238	1,370	2,074	2,586	4,336
<b>Total (c)</b>	<b>24,944</b>	<b>41,252</b>	<b>51,142</b>	<b>68,983</b>	<b>92,628</b>	<b>100,414</b>

(a) With the exception of benefits paid, figures are estimated. (b) Estimated. (c) Excludes special benefits to migrants in accommodation centres. (d) Amount includes additional benefit for children and dependent students. (e) Includes supplementary allowance.

To be eligible for unemployment or sickness benefit, a person must be at least sixteen years of age and under sixty, in the case of a female, or under sixty-five, in the case of a male. The claimant must also have lived in Australia for at least a year immediately before applying for benefit, or have the intention of remaining in Australia permanently.

Except for unmarried beneficiaries the rates of benefit are the same as for the basic pension. A beneficiary with a dependent child or children is eligible for an additional benefit for each dependent child. After having received benefit for six consecutive weeks, a sickness beneficiary is also eligible, subject to a special means test, to receive supplementary assistance if paying rent or lodging charges. This assistance is not payable to a beneficiary who is in hospital and who has no dependants.

### Rehabilitation Service

The Commonwealth Rehabilitation Service is designed to restore disabled persons as fully as possible to physical, mental, social and vocational usefulness. Treatment and training are available free of charge to a person with a physical or mental disability who is eligible in terms of the Social Services Act and for whom there are reasonable prospects of his engaging in a suitable vocation. Eligible persons include persons receiving or claiming benefits and persons who have attained the age of fourteen years and who, without that treatment or training would be likely to become qualified to receive pensions on attaining the age of sixteen years.

The Commonwealth Rehabilitation Service in Western Australia operates the Melville Centre in South Street, O'Connor, which provides a wide range of assessment and treatment facilities for those who attend daily and for residents.

There is a medical block with resident nursing staff, visits by sessional consultants and a physiotherapy unit and gymnasium. An occupational therapy unit assesses aptitudes, skills and work tolerance.

Rehabilitation counsellors help clients select and achieve suitable vocational goals and also arrange training, in appropriate cases. Trainees receive a training allowance, books and equipment allowance and reimbursement of fares.

There is a school at the Centre for those clients who require remedial education or wish to upgrade their education.

Social workers are available to help with problems of a personal nature.

The following table shows, for Western Australia, the number accepted for rehabilitation, the number placed in employment and expenditure of the rehabilitation service over the six years 1974-75 to 1979-80.

REHABILITATION SERVICE — WESTERN AUSTRALIA

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Number accepted for rehabilitation —						
Invalid pensioners	34	23	31	13	42	46
Unemployment and sickness beneficiaries	179	205	301	382	359	385
Other	72	42	86	178	155	216
Total	285	270	418	573	556	647
Number placed in employment —						
Invalid pensioners	13	14	16	9	18	22
Unemployment and sickness beneficiaries	91	110	131	183	131	157
Other	26	30	24	27	30	56
Total	130	154	171	219	179	235
Expenditure \$'000	914	1,171	1,225	1,453	1,694	1,974

### Family Allowances

Family allowances are payable to persons having the care of children under sixteen years of age or student children aged sixteen years but under twenty-five years who are receiving full-time education at a school, college or university and are not in employment or engaged in work on their own account. (Family allowances were previously referred to as child endowment and student endowment.)

Family allowances are usually paid to the mother and to be eligible for endowment she must reside, or intend to reside, permanently in Australia and have the care of one or more

children. Special conditions apply if the person does not intend to reside permanently in Australia. Family allowances paid on behalf of student children are subject to an income test based on student income.

An approved institution is qualified to receive \$5 per week in respect of each child in its care.

#### FAMILY ALLOWANCES — WESTERN AUSTRALIA (a)

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Endowed families at 30 June —						
Number of claims in force in respect of —						
Children under 16 years of age	162,198	165,731	176,870	180,009	180,008	182,731
Student children	16,767	17,700				
Number of endowed children —						
Children under 16 years of age	345,272	348,083	374,175	375,734	369,718	371,962
Student children	18,797	20,000				
Average number of endowed children per claim —						
Children under 16 years of age	2.13	2.10	2.12	2.09	2.05	2.04
Student children	1.12	1.13				
Approved institutions at 30 June —						
Number of endowed child inmates —						
Children under 16 years of age	4,430	4,915	2,171	1,811	1,597	1,422
Student children	127	151				
Total number of endowed children at 30 June —						
In families	364,069	368,083	374,175	375,734	369,718	371,962
In institutions	4,557	5,066	2,171	1,811	1,597	1,422
Total	368,626	373,149	376,346	377,545	371,315	373,384
Amount paid during year (a) (b)	\$'000	19,084 (c) (d)	22,737	89,201	90,809	86,107
				91,567		

(a) Includes payments to institutions. (b) Prior to 15 June 1976 a number of endowments were paid every 12-weeks. During two years in every three, there were four such payments each year, and five in the third year. (c) Expenditure in this year includes five 12 weekly payments; see footnote (b). (d) New rates and conditions were effective from 15 June 1976.

#### Handicapped Child's Allowance

The handicapped child's allowance is payable to parents or guardians of a physically or mentally handicapped child under sixteen years or a student child aged sixteen years but under twenty-five years engaged in full-time study, who is cared for at home and is in need of constant care and attention. An allowance of \$73 per calendar month is payable free of means test in respect of a severely handicapped child. A rate of between \$20 and \$73 per calendar month, determined by the income level of the parent or guardian and the amount of special expenses incurred in caring for the child, is payable if the disability is classified as substantial but marginally less than severe.

#### Double Orphan's Pension

Conditions relating to payment of double orphan's pension are generally similar to those applying to family allowances. For the purposes of the Social Services Act a double orphan is a child aged under sixteen years, or a student child aged sixteen but under twenty-five years, both of whose parents are dead or one of whose parents is dead and the whereabouts of the other unknown to the claimant. The benefit extends also to a child whose only surviving parent is serving a prison sentence of not less than ten years or is a patient in a mental hospital or similar institution and is likely to remain so for an indefinite period. The pension, which is additional to family allowances, is paid at the rate of \$55.70 per calendar month and is not subject to a means test. It may be paid to a person, institution or authority and is to be applied to the maintenance, training and advancement of the child. The pension is not payable in the case of a child in respect of whom a war orphan's pension is being paid in terms of the Repatriation Act.

#### Student Children

The *Social Services Act* 1973, which came into operation on 16 March 1973, defines a student child as being a person who is wholly or substantially dependent on a pensioner or beneficiary and who (a) has attained the age of sixteen years; (b) is receiving full-time education

at a school, college or university; and (c) is not in receipt of an invalid pension'. Payments on account of student children which, prior to the operation of the Act, ceased when the student reached the age of twenty-one years were thus extended without limitation in respect of age. This extension of benefit applies to student children of age, invalid and widow pensioners, of recipients of supporting parent's benefit, and of unemployment and sickness beneficiaries. However, the age limit of twenty-five years continues to apply to the payment of family allowances on account of student children.

#### **Payment of Benefits outside Australia**

Reciprocal arrangements in respect of payment of age and invalid pensions, widows' pensions, unemployment and sickness benefits and family allowances have been in force between the Governments of Australia and New Zealand since 1 July 1949 and between Australia and the United Kingdom since 7 January 1954.

The *Social Services Act* (No. 3) 1972 provided for the continued payment of a pension, subject to certain conditions, if a pensioner left Australia to reside in any other country with which appropriate reciprocal arrangements had been made. The *Social Services Act* (No. 2) 1973, which came into operation on 8 May 1973, repealed this provision and enabled age and invalid pensions (including wives' pensions) and widows' pensions, which were granted in Australia, to continue to be paid in any country where the pensioner may choose to live. A person receiving a supporting parent's benefit may continue to be paid the benefit outside Australia so long as he or she remains a supporting parent.

### **BENEFITS PAYABLE UNDER REPATRIATION ACT**

#### **Disability Pensions and Allowances**

In general, disability pensions and associated benefits are payable to a veteran and/or his dependants where the veteran has died, or been incapacitated as a result of service in the 1914-1918 War, the 1939-1945 War, or certain subsequent operations of a war-like nature. In addition, members of the Regular Defence Force who have had at least three years' service terminating on or after 7 December 1972 (or a lesser period if discharged on medical grounds) may also be eligible for repatriation pensions if incapacity resulted from that service. Dependants of deceased servicemen may also qualify for benefit.

For veterans, basic eligibility varies according to the nature of service. Broadly, for those with 'active service', incapacity or death resulting from any occurrence during war service may be accepted. The criterion applying to 'home service' is more restricted, in that incapacity or death must have arisen out of, be attributable to, or have been aggravated by, that service.

Pensions in the categories available to veterans and their dependants (see below) are also payable to eligible members of the Regular Defence Force and their dependants.

**Pensions for Veterans.** Pensions are paid to eligible veterans in three main categories: the Special Rate (known as the T.P.I.) pension, payable to a veteran who, as a result of war service, is blind, or is totally and permanently incapacitated so that he is unable to earn more than a negligible percentage of a living wage; the Intermediate Rate, payable to a veteran who, because of the severity of his incapacity accepted as related to war service, can work only part-time or intermittently and, in consequence, cannot earn a living wage; and the General Rate, payable to a veteran who has an incapacity accepted as related to war service but is not, because of that incapacity, prevented from being able to work full-time. General Rate pensions payable range from 10 per cent to 100 per cent of the maximum rate, according to the assessed degree of incapacity.

**Pensions for Dependants.** Dependants' pensions are paid to the wives of incapacitated veterans and to dependent children. Such persons are paid at rates varying with the assessed degree of the particular veteran's incapacity. When the death of a veteran has been accepted as related to his war service, his widow qualifies for the war widow's rate of pension and for associated

benefits, while his children receive pensions at 'orphan' rates and other benefits. If a veteran's death has not been accepted as related to war service, but at the time of death he was receiving, or is later adjudged to have been eligible to receive, a pension at the Special Rate (or one of certain other rates) his dependants qualify for pensions as if his death had been accepted as due to war service.

**Allowances.** Several allowances are provided to supplement disability pensions. These allowances vary according to the type or severity of disablement and the special needs of the pensioner. They include attendant's allowance, loss of earnings allowance, recreation transport allowance and domestic allowance.

An education allowance is paid in respect of children of special rate pensioners and children of veterans who died as a result of war service.

Attendant's allowance is paid at either of two rates to certain classes of severely disabled veterans, including the war-blinded, the paralysed and some double amputees. Loss of earnings allowance is payable to a veteran who has lost salary or wages because he has been undergoing medical treatment. The rate payable is equal to, or sufficient to bring any disability pension payable up to the Special Rate and is usually payable following treatment of service-related disabilities. However, under special circumstances it may also apply following treatment of non service-related disabilities. Recreation transport allowance may be paid at either of two rates for recreation purposes to certain classes of seriously disabled veterans. Domestic allowance is payable to a war widow in addition to her pension if she has attained the age of fifty years, or is permanently unemployable, or has a dependent child who is under the age of sixteen years or is undertaking approved full-time education or training and is not receiving an adequate living wage.

Amounts payable in respect of disability pensions and allowances between November 1977 and November 1980 are shown in the next table.

DISABILITY PENSIONS AND ALLOWANCES — RATES OF BENEFIT  
(\$)

Pension or allowance	Rate current at —					
	November 1977	May 1978	November 1978	November 1979	May 1980	November 1980
	per week	per week	per week	per week	per week	per week
Disability pensions —						
Veterans —						
Special (T.P.I.) rate	94.40	98.55	101.90	110.90	116.90	122.75
Intermediate rate	65.00	67.85	70.15	76.35	80.45	84.45
General rate	35.65	37.20	38.45	41.85	44.10	46.30
Wife	4.05	4.05	4.05	4.05	4.05	4.05
Each dependent child	1.38	1.38	1.38	1.38	1.38	1.38
War widow	49.30	51.45	53.20	57.90	61.05	64.10
War orphan —						
Where father dead	10.45	10.45	10.45	12.50	12.50	13.80
Where both parents dead	20.90	20.90	20.90	25.00	25.00	27.60
Allowances —						
Payments for certain amputations and/or loss of vision	2.55 to 58.75	2.55 to 61.35	2.55 to 63.45	2.55 to 69.05	2.55 to 72.80	3.95 to 76.45
Attendant's allowance —						
Higher rate	24.90	24.90	24.90	35.00	35.00	38.65
Lower rate	14.70	14.70	14.70	17.50	17.50	19.33
Sustenance allowance —						
Higher rate	94.40	98.55	101.90	(a)	(a)	(a)
Lower rate	35.65	37.20	38.45	(a)	(a)	(a)
Domestic allowance	12.00	12.00	12.00	12.00	12.00	12.00
Recreation transport allowance —	per month	per month	per month	per month	per month	per month
Higher rate	36.00	36.00	36.00	40.00	40.00	44.00
Lower rate	18.00	18.00	18.00	20.00	20.00	22.00

(a) Replaced by loss of earnings allowance from 5 October 1978. See text above.

Particulars of disability pensions in Western Australia for the six years 1974-75 to 1979-80 are given in the following table.

#### DISABILITY PENSIONS — WESTERN AUSTRALIA

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Number of pensions current at 30 June —						
Incapacitated veterans	16,737	16,428	16,104	15,672	15,290	14,874
Dependants of incapacitated veterans	20,958	20,202	19,450	18,473	17,800	17,258
Dependants of deceased veterans	4,026	3,963	3,878	3,874	3,761	3,693
Miscellaneous (a)	26	26	27	34	32	32
Total	41,747	40,619	39,459	38,053	36,883	35,857
Amount paid in pensions during year (b)	\$'000	21,845	23,118	25,587	28,728	29,098

(a) Pensions payable under Seamen's War Pensions and Allowances Act and 'Act of grace' pensions. (b) Includes widows' allowances.

#### Service Pensions and Allowances

Service pension is payable, subject to an income test similar to that applied to age and invalid pensions, to an Australian veteran who served in a theatre of war and who has attained the age of sixty years or is permanently unemployable. It is payable to a female veteran who served in a theatre of war or embarked for service abroad and has attained the age of fifty-five years or is permanently unemployable.

A service pension is therefore a broad equivalent of an age or invalid pension. The advantages to the recipient are the availability of pension five years earlier and access to a wide range of medical treatment services in the repatriation system. Service pensioners are eligible for the same range of pensions and allowances as age pensioners and the rates of benefit are the same.

Veterans of British Commonwealth Countries and Allied Countries have been eligible to receive a service pension since May 1975 and February 1980 respectively if they have resided continuously in Australia for at least ten years. They do not, however, have access to the medical treatment services in the repatriation system.

#### SERVICE PENSIONS — WESTERN AUSTRALIA

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Number of pensions current at 30 June —						
Veterans	8,502	9,377	10,308	11,127	12,030	13,208
Dependants of —						
Living service pensioners	2,799	3,619	4,548	5,835	6,751	7,910
Deceased service pensioners	505	468	469			
Act of grace pensioners	8	8	13			
Total	11,814	13,472	15,338	16,975	18,794	21,131
Amount paid in pensions during year	\$'000	15,149	20,560	26,933	33,785	45,911

#### Student Children

Prior to amendments made to the Repatriation Act in 1973, benefits and allowances payable in respect of student children, i.e. dependent persons receiving full-time education at a school, college or university, ceased when the student reached the age of twenty-one years. Subsequent amendments continue payment until the student reaches the age of twenty-five years.

#### Payment of Benefits outside Australia

The *Repatriation Act* (No. 2) 1973, which came into operation on 8 May 1973, authorises the payment of a service pension in any country in which the pensioner may choose to live. This provision had previously applied only to disability pensions.

#### DEPARTMENT FOR COMMUNITY WELFARE, WESTERN AUSTRALIA

The *Community Welfare Act 1972-1978* which came into operation on 1 July 1972, established the Department for Community Welfare. The *Child Welfare Act Amendment Act (No. 2) 1972*

abolished the former Child Welfare Department and transferred its functions to the Department for Community Welfare. The *Aboriginal Affairs Planning Authority Act 1972* repealed the *Native Welfare Act 1963*. The welfare functions of the former Department of Native Welfare were transferred to the Department for Community Welfare with effect from 1 July 1972.

The functions of the Department for Community Welfare, as defined in the *Community Welfare Act 1972-1978*, are: '(a) to promote individual and family welfare in the community; (b) to prevent the disruption of the welfare of individuals and families in the community, and to mitigate the effects of any disruption; (c) to co-ordinate, assist and encourage the provision of social welfare services to the community, and for that purpose to confer and collaborate with other bodies and instrumentalities who offer, or may offer, a social welfare service; (d) to conduct, promote and encourage research into the problems of community welfare; (e) to conduct, promote and encourage programmes of training or rehabilitation, or which are otherwise of a nature that is concerned with the advancement of the welfare of particular individuals or groups in the community who are disadvantaged; (f) to consider and initiate, or to assist in, the provision and development of new or additional welfare services, whether of a general or specific nature, for individuals or groups within the community who are needy or disadvantaged; (g) to encourage the development of the greatest possible degree of service and administration at the local level, and to emphasise the value of preventive measures; (h) to provide assistance, where the Minister considers it to be necessary, when the welfare of any individual, family or group is threatened or in jeopardy; (i) to provide and, where appropriate, to manage facilities, which may include land, buildings and specialized appliances, for specific purposes consistent with the objects of this Act; (j) generally, to administer and give effect to the provisions of this Act and to carry out such other functions as may be prescribed, or as the Minister may direct.'

The Acts administered by the Director of the Department for Community Welfare, subject to any direction of the Minister, are the Community Welfare Act, the Child Welfare Act, the Welfare and Assistance Act, the Adoption of Children Act, and the Guardianship of Children Act.

#### STATE RELIEF PAYMENTS

Under the provisions of the *Welfare and Assistance Act 1961*, the State Government, through the Department for Community Welfare, extends financial assistance to indigent persons not immediately eligible for benefits paid by the Commonwealth Government under its social security programme. These relief payments are made primarily to ensure that single parent families without adequate income or support do not suffer financial hardship. Those assisted include separated wives or husbands, unmarried mothers, wives of prisoners and other special cases.

Other aid provided by the State for persons in need includes free travel for country people requiring medical treatment in the metropolitan area and a contribution towards the cost of high school uniforms for children of women receiving financial assistance. In certain circumstances, the burial of indigent persons is arranged at the State expense.

Single parents applying to the Department for assistance are given advice concerning the legal redress available to them and it is usual for application to be made to the Family Law Court or a Children's Court for an order requiring the spouse or the father to provide maintenance. Court orders are enforceable throughout Australia and in certain overseas countries.

Under the *States Grants (Deserted Wives) Act 1968* the Commonwealth Government shares on a \$1 for \$1 basis with the States the cost of helping certain mothers of families without a breadwinner where the mother is ineligible for a Class A widow's pension or the supporting parent's benefit. The main groups of mothers assisted are deserted wives, wives of prisoners,



and unmarried mothers. Assistance is provided during the first six months after the birth of a child or the date of separation. After the first six months, a woman may qualify for either a Class A widow's pension or a supporting parent's benefit.

The grant by the Commonwealth Government to a State is equal to half the cost of the approved assistance paid by the State to each eligible person but may not exceed half the amount that would have been payable to such a person under the Social Services Act had she been eligible for a Class A widow's pension.

The Department for Community Welfare also provides non-continuous assistance to destitute persons in emergency circumstances or whilst awaiting payment of Commonwealth social security benefits.

The following table shows the maximum weekly rates of allowances and benefits paid in terms of the Welfare and Assistance Act and the Child Welfare Act.

**STATE GOVERNMENT RELIEF AND WELFARE PAYMENTS  
MAXIMUM WEEKLY RATES  
(\$)**

Allowance or benefit	Rate current at —					
	November 1977	May 1978	November 1978	November 1979	May 1980	November 1980
Parent not receiving Commonwealth Government assistance	49.30	51.45	53.20	57.90	61.05	64.10
Additional payments in respect of dependent children —						
First child	11.50	11.50	11.50	11.50	11.50	16.00
Second and each subsequent child	7.50	7.50	7.50	7.50	7.50	10.00
Supplementary allowances —						
Child aged under 6 years or invalid child aged under 16 years	2.00	2.00	2.00	2.00	2.00	2.00
Rent allowance	5.00	5.00	5.00	5.00	5.00	5.00
Wards of the State —						
Foster children in families —						
Each child	18.75	18.75	18.75	20.25	20.25	22.25
Additional payment for each high school child	3.25	3.25	3.25	3.50	3.50	3.75
In institutions —						
Each child	18.75	18.75	20.25	21.75	21.75	24.00
Additional payment for each high school child	3.25	3.25	3.50	3.75	3.75	4.00
Allowance for each high school child (a) —						
At first year level	2.00	2.00	2.00	2.00	2.00	2.00
At second year level	2.00	2.00	2.00	2.00	2.00	2.00
At third year level	2.00	2.00	2.00	2.00	2.00	2.00
At fourth and fifth year levels	3.00	3.00	3.00	3.00	3.00	3.00
Foster child (b) —						
In institution	18.75	18.75	20.25	21.75	21.75	24.00
In private home	18.75	18.75	18.75	20.25	20.25	22.25

(a) Applies to all wards, whether accommodated in institutions or living as foster children in families. (b) Foster child not being a ward of the State. Separate rates for foster children in institutions or private homes have applied from October 1978.

**STATE GOVERNMENT FINANCIAL ASSISTANCE TO FAMILIES**

Particulars	Number of new applications received					
	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Separated wives	3,278	3,372	3,856	4,366	4,795	4,646
Wives of prisoners	320	264	234	203	201	207
Emergency assistance (including husband sick or unemployed)	10,250	9,867	9,710	14,218	13,221	8,646
Unmarried mothers	617	644	623	692	686	687
Separated husbands	48	53	64	95	94	89
Travel	—	976	755	1,096	1,417	1,061
Other	—	28	121	102	23	7
Total applications	14,513	15,204	15,363	20,772	20,437	15,343

## CHILD WELFARE

Under the provisions of the *Child Welfare Act 1947-1979* the State Government, through the Department for Community Welfare, is responsible for the care of wards and children placed under control and supervision or released on probation by Children's Courts. For the purposes of the Act, a child is defined as 'any boy or girl under the age of eighteen years'. Fit and proper persons may be licensed to care for children and are subject to supervision by the Department. Other functions of the Department are the arranging of legal adoptions and the control of children employed in street trading and in public entertainment. A provision of the Child Welfare Act vests in the Department the right to decide which centre or facility or what form of treatment is appropriate to the needs of a child committed by a Children's Court to the care of the Department for treatment, discipline and training.

Children's Courts established at Perth, Fremantle, Midland and Rockingham, and at most country towns throughout the State have jurisdiction in all cases where children under eighteen years of age are involved whether as offenders or as being in need of care and protection. The Courts also have jurisdiction to deal with adults committing certain specified offences against children. The public may be excluded from Court hearings and names of juvenile offenders are withheld from publication unless with the express authority of the Court. Adults charged with certain indictable offences against children may forgo the right to trial by jury and agree to be dealt with summarily by Children's Courts. This power to exercise summary jurisdiction is designed to eliminate as far as possible the necessity for children to appear in open courts as witnesses in cases dealing with sex offences. A Children's Court may commit such offenders for sentence by the Supreme Court of Western Australia or The District Court of Western Australia.

Children guilty of minor offences may be cautioned, fined, placed on probation, or the charge may be dismissed without a conviction being recorded. A Court may declare a child to be in need of care and protection and may order the child to be committed to the care of the Department for Community Welfare, placed under the control of the Department, or released on probation. Children found guilty of offences punishable by imprisonment may be dealt with in a similar manner. Those guilty of less serious or first offences are generally placed in the care of their parents or suitable guardians under appropriate supervision by officers of the Department for Community Welfare. Children aged seven to fifteen years who admit a less-serious first offence may be dealt with by a Panel instead of appearing before a Children's Court. Panels are made up of an authorised officer of the Department and a senior or retired police officer. They may suspend action against children for up to six months. No conviction is recorded if the children do not re-offend in that period. Children who commit a second offence, or whose conduct is unsatisfactory during the period of suspended action, appear before a Children's Court on the original and subsequent charges. Parents are required to attend with their children. Further reference to Children's Courts appears in the section *Law Courts* in Part 6 of this Chapter.

**Supervision of Children.** A child committed to the care of the Department for Community Welfare or to the custody of the Director of the Department for Community Welfare becomes a ward of the Department. A ward may be placed in a Departmental centre or facility, boarded out with a relative or other approved person, paroled or placed in suitable employment. Where a child is placed under the control of the Department for Community Welfare, the child's parents retain guardianship functions and responsibilities. The Director of the Department for Community Welfare has authority to place wards of working age in employment or apprenticeship. The *Immigration (Guardianship of Children) Act 1946* (Commonwealth) provides that the Minister for Immigration shall be the guardian of migrant children under the

age of twenty-one years who are not in the care of a parent or other relative. In Western Australia this function is exercised, under delegation, by the Director of the Department for Community Welfare.

**Departmental Expenditure.** The following table gives details of annual expenditure of the Department for Community Welfare during the six-year period ended 30 June 1980.

DEPARTMENTAL EXPENDITURE  
(\$'000)

Nature of expenditure	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Administration	1,644	2,057	2,473	2,747	3,673	4,325
Field services	3,280	4,690	5,640	6,631	7,110	8,113
Departmental institutions	4,987	6,178	7,033	7,948	8,048	9,002
Maintenance of children	2,457	2,803	2,970	2,969	2,998	3,149
Adoption of children	145	54	20	(a)	(a)	(a)
Financial assistance (b)	1,590	2,098	2,623	6,127	6,682	7,087
Unemployment relief	156	131	166	282	247	(c)
Community Welfare assistance	1,072	680	896	969	1,249	1,483
Reserves (Aboriginal housing)	394	322	1,079	1,061	453	376
Residential Child Care	—	—	—	1,246	1,528	1,657
Total expenditure	15,726	19,012	22,901	29,981	31,988	35,192
Total revenue	991	1,640	2,058	5,274	4,627	5,386
Net expenditure	14,734	17,372	20,843	24,707	27,361	29,806

(a) Included under *Maintenance of children*. (b) Assistance to women with dependent children and to the infirm. (c) Transferred to the Commonwealth Department of Social Security from April 1979.

**Maintenance of Children.** The Department for Community Welfare makes payments at the rates shown in the table in the section, *State Relief Payments* to foster parents and institutions having State wards in their care. The British Government pays \$2.50 per week for each British migrant child in an institution or boarded out and the State Government pays an additional amount of 60 cents per week for the first twelve months after arrival. A further grant of one dollar per week for each child maintained is paid to the institutions by the State Lotteries Commission. Where an institution refuses assistance from the Commission on religious or moral grounds the State Government may grant an equivalent allowance to the institution for each ward maintained. All institutions and foster parents having the care of children receive Commonwealth family allowances.

Parents or step-parents are required to contribute towards the maintenance of wards in institutions or boarded out.

**Day Care Centres.** Any person who provides day-to-day care of children under the age of six years must have a licence issued by the Department for Community Welfare in accordance with regulations which specify standards relating to premises, furnishings, equipment, staffing and the general conduct of centres. An advisory service is provided by the Department to assist those wishing to establish centres, and to ensure that the regulations are observed and that good standards of child care are maintained.

The Commonwealth Government, under the provisions of the *Child Care Act* 1972, provides financial assistance to certain non-profit organisations for the establishment and operation of child care centres primarily for the children of working or sick parents or of parents who for other reasons are unable to care for them during the day. Capital grants are payable to eligible organisations for the purchase, erection, extension or alteration of buildings (including land cost) for use as a child care centre. Recurrent grants are payable to encourage the employment of qualified staff and to enable the centres to offer reduced fees in respect of children from families in financial need. The Act also provides for grants to be made available to suitable bodies for research and evaluation of matters relating to child care.

**Institutions.** The State Government subsidises homes for children in Western Australia. Most of these centres and facilities are conducted by religious organisations. All

institutions having the care of wards (including migrant children) or private children under six years of age are subject to the supervision of the Department for Community Welfare.

#### CHILDREN IN DEPARTMENTAL INSTITUTIONS

Institution	At 30 June —					
	1975	1976	1977	1978	1979	1980
Bridgewater Care and Assessment Centre, Applecross	61	32	64	72	91	72
Hillston Farm School, Stoneville	81	69	62	27	42	33
Longmore Remand and Assessment Centre, Bentley	53	97	60	63	62	73
McCall Treatment Centre, Cottesloe	17	11	14	17	14	12
Nyandi, Bentley	17	40	11	16	16	14
Riverbank, Caversham	36	32	24	21	36	43
Walcott, Mount Lawley	31	50	20	28	20	31
Total	296	331	255	244	281	278

Departmental institutions provide short-term accommodation for children in need of care and children awaiting proceedings in Children's Courts; assessment facilities for children coming into the care of the Department; treatment centres of a secure nature; and hostel accommodation. Children aged from three years to eighteen years are provided for. Wards under three years of age requiring short-term care are placed by arrangement at Ngal-a Mothercraft Home and Training Centre, South Perth.

**Adoption of Children.** All children eligible for adoption in Western Australia come under the guardianship of the Director of the Department for Community Welfare. A person wishing to adopt a child may apply direct to the Department or through a solicitor. Each applicant must be assessed by the Department for suitability, and an order for the legalisation of an adoption must be obtained from a Judge of the Family Court of Western Australia.

**Employment of Children.** The *Child Welfare Act 1947-1979* provides the conditions under which children may engage in street trading. Male children under twelve and female children under school leaving age are not permitted to engage in street trading.

The Department is authorised under the Act to carry out any investigations necessary, relative to children engaged in public performances and ensuring their safety and welfare.

*Chapter V—continued*

**Part 5 — Housing and Building**

**HOUSING AND THE CENSUS**

The definitions given below are relevant when considering data derived from the Census of Population and Housing.

**OCCUPIED DWELLING.** For the purpose of the Census of Population and Housing an occupied dwelling is any habitation occupied on census night by a household group living together as a domestic unit, and may comprise the whole of a building or only part of it. The term has therefore a very wide reference and includes, in addition to houses and flats, a great variety of dwellings ranging from a single-roomed shack to a multi-roomed hotel or institution.

**UNOCCUPIED PRIVATE DWELLING.** An unoccupied private dwelling is defined as a structure built specifically for private living purposes and capable of being lived in, though unoccupied at the time of the census. The term includes vacant dwellings available for sale or renting; dwellings such as week-enders or holiday homes which were not occupied on census night; dwellings normally occupied but whose occupants were temporarily absent on the night of the census; newly-completed dwellings whose owners or tenants had not entered into occupation on census night; and dwellings described as 'to be demolished', 'condemned', 'exhibition home', etc. The total number of unoccupied dwellings does not, therefore, represent the number of vacant houses and flats available for sale or renting.

**PRIVATE DWELLINGS** comprise the following classes:

**PRIVATE HOUSE,** which includes separate houses; semi-detached houses; attached houses; terrace houses; and villa units.

**SELF-CONTAINED FLAT.** A self-contained flat is part of a house or other building which can be completely closed off and which has its own cooking and bathing facilities. Home units are included in this class.

**OTHER FLAT** is part of a house, flat or other premises which is not self-contained.

**OTHER PRIVATE DWELLINGS** include sheds, tents, garages, caravans, houseboats, etc. occupied on a permanent or semi-permanent basis.

### Dwellings at Censuses from 1901

The number of unoccupied dwellings shown for censuses prior to 1971 include both private and non-private dwellings, while those for the 1971 and 1976 Censuses refer to private dwellings only.

#### DWELLINGS — CENSUSES, 1901 TO 1976 (a)

Census date	Occupied dwellings				Unoccupied dwellings
	Private		Non-private	Total	
	Number	Average number of inmates			
1901 — 31 March	(b) 46,436	(c) 3.35	2,070	48,506	2,263
1911 — 3 April	(d) 66,553	(e) 3.68	2,317	68,870	3,158
1921 — 4 April	70,185	4.11	3,363	73,548	3,274
1933 — 30 June	100,441	3.95	3,137	103,578	4,029
1947 — 30 June	122,078	3.73	2,689	124,767	2,606
1954 — 30 June	159,496	3.64	3,327	162,823	6,614
1961 — 30 June	191,616	3.59	2,701	194,317	13,705
1966 — 30 June	222,416	3.53	3,285	225,701	17,965
1971 — 30 June	284,359	3.38	2,486	286,845	(f) 28,274
1976 — 30 June	336,768	3.18	2,337	339,105	(f) 34,064

(a) Figures for censuses prior to 1966 exclude dwellings occupied solely by full-blood Aborigines; those for 1966 and later relate to all dwellings. (b) Comprises 17,702 dwellings of calico, canvas, and hessian, with an average of 2.10 inmates, and 28,734 other dwellings with an average of 4.12 inmates. (c) See note (b). (d) Comprises 14,216 dwellings of calico, canvas, and hessian, with an average of 1.93 inmates, and 52,337 other dwellings with an average of 4.16 inmates. (e) See note (d). (f) Unoccupied private dwellings only.

The following table gives particulars of the numbers of occupied dwellings at the Censuses of 1971 and 1976, together with the total numbers of persons enumerated.

Between the Censuses of 1971 and 1976, the number of occupied dwellings in the State increased by 18.2 per cent. The number of persons enumerated in private dwellings showed an increase of 11.2 per cent.

#### OCCUPIED DWELLINGS AND PERSONS ENUMERATED CENSUSES, 1971 AND 1976

Particulars	Census, 30 June —					
	1971		1976		Increase since 1971	
	Number	Per cent of total	Number	Per cent of total	Number	Per cent
Occupied dwellings —	'000		'000		'000	
Private	284.4	99.1	336.8	99.3	52.4	18.4
Non-private	2.5	0.9	2.3	0.7	—0.1	—6.0
Total, Occupied dwellings	286.8	100.0	339.1	100.0	52.3	18.2
Persons enumerated in —						
Private dwellings	962.2	93.4	1,070.1	93.5	107.9	11.2
Non-private dwellings	(a) 65.6	(a) 6.4	71.5	6.2	..	..
Migratory population (b)	2.6	0.2	(a) 3.2	(a) 0.3	..	..
Total population	1,030.5	100.00	1,144.9	100.0	114.4	11.1

(a) Includes campers-out. (b) Comprises persons (both passengers and crew) who, at midnight on census night, were enumerated on board ships in Western Australian ports, or ships which had left an Australian port before census night for a next port of call in Western Australia. It includes also those who were enumerated on long-distance trains, motor coaches or aircraft.

### Occupied Private Dwellings

**Number of Rooms.** The following table shows details of the number of rooms in occupied private dwellings at the Census of 30 June 1976.

**OCCUPIED PRIVATE DWELLINGS**  
**NUMBER OF ROOMS (a): CENSUS, 30 JUNE 1976**

Number of rooms (a)	Separate house			Other (b)		
	Perth Statistical Division	Rest of State	Total	Perth Statistical Division	Rest of State	Total
1	40	78	118	426	542	968
2	206	326	532	3,330	940	4,270
3	1,256	1,246	2,502	11,628	1,730	13,358
4	12,912	7,384	20,296	21,088	3,028	24,116
5	62,266	27,994	90,260	11,826	2,838	14,664
6	58,294	20,566	78,860	4,450	1,296	5,746
7	32,632	10,114	42,746	1,556	508	2,064
8 or more	22,594	7,472	30,066	1,042	520	1,562
Not stated	582	244	826	2,420	1,394	3,814
Total	190,782	75,424	266,206	57,766	12,796	70,562

(a) Includes kitchen, bathroom and permanently enclosed sleep-out, but does not include toilet, pantry, laundry, storeroom, hall or corridor. (b) Includes flat, home unit, mobile home (not in caravan park), improvised dwelling and private boarding house.

**Number of Bedrooms.** The next table shows details of the number of bedrooms in occupied private dwellings at the Census of 30 June 1976.

**OCCUPIED PRIVATE DWELLINGS**  
**NUMBER OF BEDROOMS (a): CENSUS, 30 JUNE 1976**

Number of bedrooms (a)	Separate house			Other (b)		
	Perth Statistical Division	Rest of State	Total	Perth Statistical Division	Rest of State	Total
None (c)	88	92	180	492	560	1,052
1	1,936	1,260	3,196	14,844	2,092	16,936
2	25,512	10,988	36,500	25,192	3,954	29,146
3	120,612	44,286	164,898	12,808	3,626	16,434
4	36,794	15,296	52,090	1,598	820	2,418
5	4,378	2,598	6,976	308	202	510
6 or more	880	660	1,540	104	148	252
Not stated	582	244	826	2,420	1,394	3,814
Total	190,782	75,424	266,206	57,766	12,796	70,562

(a) Includes permanently enclosed sleep-out. (b) Includes flat, home unit, mobile home (not in caravan park), improvised dwelling and private boarding house. (c) Includes one-room flat and bed-sitting room.

**Unoccupied Private Dwellings**

For dwellings not occupied on the night of the census, collectors were required to determine as many particulars as possible and, where the information was available, to enter on the census schedule the reason why the dwelling was unoccupied. The following table shows details of unoccupied private dwellings at the Census of 30 June 1976.

**UNOCCUPIED PRIVATE DWELLINGS — CENSUS, 30 JUNE 1976**

Reason for being unoccupied	Perth Statistical Division	Rest of State	Total
For sale	1,114	398	1,512
To let, not holiday home	2,788	1,354	4,142
New, awaiting occupancy	1,588	442	2,030
Vacant for repair etc.	684	590	1,274
Holiday home	1,894	5,392	7,286
Condemned for demolition	362	602	964
Resident temporarily absent	6,874	3,732	10,606
Other, n.e.i.	1,576	3,122	4,698
Not stated	828	724	1,552
Total	17,708	16,356	34,064

### Geographical Distribution of Dwellings

**Statistical Divisions.** The following table shows the numbers of occupied and unoccupied dwellings in each statistical division of Western Australia at the Censuses of 1971 and 1976.

The former grouping of municipal districts on the basis of climatological and geographical characteristics was revised with effect from 1 January 1976 to take into account also social and economic criteria. (The statistical divisions and their component local government areas are shown in lists at the end of Chapter III.)

Between the Censuses of 1971 and 1976 the number of dwellings in Western Australia rose by 18.4 per cent. The number in the Perth Statistical Division increased by 23.3 per cent, compared with an increase of 7.8 per cent in the rest of the State. Other divisions showing an increase were Pilbara, 35.0 per cent; South-West, 13.2 per cent; Lower Great Southern, 6.9 per cent; Midlands, 4.5 per cent; Central, 3.2 per cent; and South-Eastern, 3.0 per cent. Divisions showing a decrease were Upper Great Southern, 2.4 per cent and Kimberley, 10.8 per cent.

#### DWELLINGS IN STATISTICAL DIVISIONS — CENSUSES, 1971 AND 1976

Statistical division	Census, 30 June 1971 (a)		Census, 30 June 1976			
	Total occupied dwellings	Un-occupied private dwellings	Occupied dwellings			Un-occupied private dwellings
			Private	Non-private	Total	
Perth Statistical Division	203,007	13,696	248,548	856	249,404	17,708
Other divisions —						
South-West	22,184	5,412	24,940	208	25,148	6,092
Lower Great Southern	10,635	1,829	11,290	128	11,418	1,908
Upper Great Southern	6,532	1,160	6,500	101	6,601	908
Midlands	13,928	2,633	13,834	211	14,045	3,260
South-Eastern	10,850	1,216	10,634	210	10,844	1,580
Central (b)	11,361	1,619	11,502	239	11,741	1,652
Pilbara	5,488	583	7,198	238	7,436	760
Kimberley	2,860	126	2,322	146	2,468	196
Total	83,838	14,578	88,220	1,481	89,701	16,356
WESTERN AUSTRALIA	286,845	28,274	336,768	2,337	339,105	34,064

(a) The 1971 Census figures have been adjusted to provide figures on the basis of the boundaries of local government areas at 30 June 1976. (b) Includes Houtman Abrolhos (unincorporated).

**Australian States.** The following table gives the numbers of dwellings recorded in each of the Australian States and in Australia as a whole at the Census of 30 June 1976.

#### DWELLINGS — AUSTRALIAN STATES: CENSUS, 30 JUNE 1976

Type of dwelling	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	Australia (a)
Occupied dwellings —							
Private	1,491,826	1,121,578	598,140	390,514	336,768	121,832	4,140,521
Non-private	7,175	4,726	4,286	1,739	2,337	741	21,543
Total, Occupied dwellings	1,499,001	1,126,304	602,426	392,253	339,105	122,573	4,162,064
Unoccupied private dwellings	152,960	119,592	62,686	39,768	34,064	15,786	431,200
Total dwellings	1,651,961	1,245,896	665,112	432,021	373,169	138,359	4,593,264

(a) Includes Northern Territory (22,885 occupied private dwellings, 385 occupied non-private dwellings and 2,292 unoccupied dwellings) and Australian Capital Territory (56,978 occupied private dwellings, 154 occupied non-private dwellings and 4,052 unoccupied dwellings).

### GOVERNMENT AND GOVERNMENT-SPONSORED HOUSING

#### The State Housing Commission

The State Housing Commission was established in January 1947 by the State Housing Act of 1946 to replace the Workers' Homes Board which had been in operation since 1912.

The objectives of the legislation were 'the improvement of existing housing conditions' and 'the provision of adequate and suitable housing accommodation for persons of limited means and



certain other persons not otherwise adequately housed'. The Act remained in force until repealed and replaced by the Housing Act of 1980. Further details of the repealed Act are given on page 259 of the *Western Australian Year Book*, No. 19 — 1981 and in earlier issues.

The *Housing Act* 1980 preserves and continues the State Housing Commission. The Act has as its objectives 'the improvement of existing housing conditions, the provision of housing and land for housing, the provision of assistance to enable persons to obtain accommodation or improve the standard of their accommodation, the encouragement of the development and redevelopment of land for housing and related purposes and the carrying into effect of agreements and arrangements entered into with the Commonwealth with respect to housing'. More specifically the legislation provides for the acquisition, development and disposal of land, the erection of houses, the lease or sale of houses, the letting of houses on a weekly rental basis, the making of loans for the purchase of homes, the provision of financial assistance by way of Government guarantees or subsidies, the making of agreements for financial assistance either with the Commonwealth or lending institutions and the provision of specialised housing and community facilities.

The Commission consists of seven members of whom one must be the person occupying the office of General Manager of the Commission, the remaining six being appointed by the Governor.

Funds for the Commission's operations are provided by the State Government or raised through the creation and issue of debentures or of inscribed stock.

Eligibility for assistance is restricted to persons with income below a prescribed amount, the amount being subject to quarterly adjustment according to the movement in the seasonally adjusted national average weekly earnings. Outside the Perth Metropolitan Region, the Minister may allow assistance to a family having a higher income.

A function of the Commission additional to those associated with the provision of land, housing and finance for low or moderate income families is the construction and maintenance of dwellings on behalf of the Government Employees' Housing Authority and the Industrial and Commercial Employees' Housing Authority.

Tables showing the operations of the Commission are shown later in this Part.

**Commonwealth and State Housing Agreements.** Legislation enabling agreements between the Commonwealth Government and State Governments to provide homes and associated finance for persons in need of government assistance has been in existence in the form of various Commonwealth and State Acts since 1945.

The original 1945 agreement provided a broad basis of collaboration between the Commonwealth and the State with the Commonwealth providing advances of money and general direction on policy and the State undertaking the actual site acquisition and planning, the construction or acquisition of dwellings, the selection of tenants and the detailed administrative work. Subsequent Acts provided for a nominated amount of money allocated to the State to be advanced to building societies and other approved institutions for lending to private persons for the building or purchase of homes.

A more detailed account of the various Commonwealth and State Housing Agreements is given on page 259 of the *Western Australian Year Book*, No. 19 — 1981 and in earlier issues. The latest agreement, which expired on 30 June 1981, incorporated the *Housing Assistance Act* 1978 (Commonwealth) and the *Housing Agreement (Commonwealth and State) Act* 1973-1978 (State).

**Housing Assistance Act.** The *Housing Assistance Act* 1978 was enacted to continue the provision of housing assistance after the termination of the *Housing Assistance Act* 1973. Except in specified circumstances the provisions of this agreement supersede the provisions of earlier housing agreements.

The objective of this agreement is to provide States with financial assistance from the Commonwealth for rental housing and home purchase. The allocation of assistance between the two may be varied but in respect of the financial year commencing 1 July 1980, the amount provided for home purchase assistance was not to be less than 40 per cent of the total advances.

Rental housing assistance funds are used principally for the provision of rental housing by State housing authorities but may be used for other purposes such as urban renewal, funding of voluntary housing management groups or housing advisory services.

Conditions of eligibility of persons for rental housing assistance ensure that assistance is directed to those most in need. Rental rates are fixed by the State in accordance with a policy of relating rents to the rates applying on the open market. Provision also exists for rebates to tenants unable to pay the full rental.

That part of the agreement relating to home purchase assistance differs significantly from previous agreements. Housing authorities may no longer assist purchasers under vendor finance as was previously permitted. Instead, assistance is to be extended through terminating building societies (primarily), co-operative housing societies or such other lending institutions, including permanent building societies, as may be agreed upon between the Commonwealth and State Ministers. In addition, the interest rate to be applied to purchasers shall be not less than 5 per cent per annum until the end of the first financial year that occurs wholly after the loan is made. The rate will then be increased by  $\frac{1}{2}$  per cent per annum in each subsequent year until a rate equivalent to 1 per cent per annum below the long term bond rate is reached, after which it will be varied according to any variation which occurs in the long term bond rate.

Eligibility conditions for loans ensure that only those persons who are not able to obtain mortgage finance in the open market or from other sources receive assistance. The agreement allows flexible lending practices, including provision for variation in repayment in the event of hardship.

Part III of the *Housing Assistance Act* 1978 continues the provision of assistance contained in the States Grants (Dwellings for Pensioners) Act which expired on 30 June 1978. The provision authorises grants to States for rental assistance to pensioners and other persons in need as determined by the Federal Minister. On 28 June 1979, Aboriginals were declared as persons qualifying for special purpose grants.

A separate agreement between the Commonwealth Government and the States has been entered into covering this provision of housing for serving members of the armed forces. Under this agreement the Commonwealth provides, by way of repayable advances, all the funds required and the States are not required to set aside part of their housing allocation for this purpose.

**Aboriginal Housing.** The Commonwealth Government provides annual grants, through the *Housing Assistance Act* 1978 and the Department of Aboriginal Affairs, for the housing of Aboriginal people. In 1979-80, nine metropolitan and sixty-three country Aboriginal housing units were constructed.

**Other Functions.** The State Housing Commission conducts certain other housing schemes and has completed, or is currently engaged on, other specific projects on behalf of the State Government. In the period 1952-53 to 1979-80 the State Housing Commission has constructed 2,871 dwellings for other government departments and semi-government authorities. A Government Employees' Housing Scheme was introduced in 1958-59 and, up to 30 June 1980, had provided 1,475 rental houses. The Commission has also undertaken the erection of flats for occupation by widows, aged single pensioners and aged married couples. Design and supervisory services have been made available free of cost to several private charitable organisations which are developing pensioner housing schemes financed jointly by these organisations and the Commonwealth Government under the *Aged Persons Homes Act* 1954

(Commonwealth). The Commission has also been made responsible from time to time for special housing schemes for industry or major developmental projects.

### Operations of The State Housing Commission

In this section, a summary of the activities of The State Housing Commission is given. The second table below shows the number of housing units completed by the Commission in various categories during each year from 1974-75 to 1979-80. It also shows the number of housing units in connection with which the Commission provided design and supervisory services free of cost to private charitable organisations.

#### THE STATE HOUSING COMMISSION REVENUE, EXPENDITURE AND FUNDS EMPLOYED (\$'000)

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
<b>Revenue —</b>						
Rentals	13,185	17,060	19,586	24,337	27,764	28,882
Profit on sale of —						
Houses and land	4,626	8,489	9,889	9,310	8,220	17,338
Sundry assets	25	50	34	30	66	54
Interest —						
Home purchase	5,360	5,542	6,012	5,800	5,388	4,903
Other	786	1,655	2,189	2,379	1,690	1,244
Recoup of management expenses	654	1,033	1,470	2,363	2,443	4,116
Fees and miscellaneous	933	1,341	1,601	2,262	1,826	819
<b>Total, Revenue</b>	<b>25,569</b>	<b>35,170</b>	<b>40,781</b>	<b>46,481</b>	<b>47,397</b>	<b>57,356</b>
<b>Expenditure —</b>						
Interest —						
Loan capital	10,323	11,726	12,244	12,617	13,209	12,659
Debentures	1,679	1,949	2,059	2,127	2,201	2,278
Amortisation	1,374	1,539	3,750	4,578	5,380	6,642
Management expenses	6,843	7,728	8,717	9,763	10,946	12,072
Rental outgoings	7,805	9,227	11,939	15,516	14,042	17,099
Other	17	20	58	57	112	(a) 3,736
<b>Total, Expenditure</b>	<b>28,041</b>	<b>32,189</b>	<b>38,767</b>	<b>44,658</b>	<b>45,890</b>	<b>54,486</b>
<b>Surplus</b>	<b>(b) 2,472</b>	<b>2,981</b>	<b>2,014</b>	<b>1,823</b>	<b>1,507</b>	<b>2,870</b>
<b>Funds employed at 30 June —</b>						
Loan indebtedness —						
Government advances	292,369	323,478	355,844	392,044	427,004	443,225
Debenture issues	26,604	28,666	29,192	29,876	30,505	31,268
Commonwealth special grants	6,849	7,387	8,596	9,142	10,151	17,146
Accumulated surpluses and reserves	35,646	37,685	40,563	43,954	47,473	53,278
<b>Total, Funds employed</b>	<b>361,468</b>	<b>397,216</b>	<b>434,195</b>	<b>475,016</b>	<b>515,133</b>	<b>544,917</b>

(a) Includes accumulated Aboriginal housing rental deficiencies transferred to the State Housing Commission (\$3,672,188). (b) Deficit.

#### THE STATE HOUSING COMMISSION — DWELLINGS CONSTRUCTION

Category	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
<b>Housing units (a) completed —</b>						
State Housing Act	373	377	160	251	—	—
Commonwealth and State Housing Agreements (b)	494	387	655	995	700	660
Aboriginal Housing	119	50	64	39	40	72
Departmental Homes	42	34	34	38	38	48
Government Employees' Homes	53	113	79	197	133	140
Shire Building Scheme (c)	9	11	—	11	14	5
Dwellings for Aged Pensioners (d)	16	64	78	52	51	104
Other (e)	7	24	13	17	19	49
<b>Total</b>	<b>1,113</b>	<b>1,060</b>	<b>1,083</b>	<b>1,600</b>	<b>995</b>	<b>1,078</b>
<b>Other activities (f)</b>	<b>37</b>	<b>74</b>	<b>16</b>	<b>7</b>	<b>6</b>	<b>34</b>

(a) Comprises number of houses and number of individual units in other dwellings. (b) See letterpress at the beginning of this section. (c) For local government employees. (d) Constructed under the provisions of the *States Grants (Dwellings for Aged Pensioners) Act 1969*, the *States Grants (Dwellings for Pensioners) Act 1974* and Part III of the *Housing Assistance Act 1978*. (e) Comprises houses built by the Commission in terms of the *Industrial and Commercial Employees' Housing Act 1973-1977* and Project Development (Special Agreements Scheme) and other schemes. (f) The figures shown represent housing units built by charitable organisations in connection with which the Commission provided design and supervisory services.

### Government Employees' Housing Authority

The Government Employees' Housing Authority is established under the provisions of the *Government Employees' Housing Act 1964-1973* to provide adequate and suitable housing accommodation for employees of State Government Departments to which the Act applies.

The Authority is empowered to enter into an agreement with the State Housing Commission whereby the Commission shall act as its agent upon such terms as may be mutually agreed upon by the Authority and the Commission.

### Industrial and Commercial Employees' Housing Authority

The Industrial and Commercial Employees' Housing Authority is established under the provisions of the *Industrial and Commercial Employees' Housing Act 1973-1977* with the aim of providing adequate and suitable housing for key industrial or commercial employees in employment outside the Metropolitan Region.

The Authority comprises five Members of whom the Chairman is a person having a statewide and comprehensive experience in the planning, provision and management of housing. Other Members include the permanent head of the Department of Development and Decentralisation (now the Department of Industrial Development and Commerce) or his nominee, a representative of the Confederation of Western Australian Industry (Incorporated), a representative of the Perth Chamber of Commerce (Inc.) and a person representing The Trades and Labor Council of Western Australia.

To 30 June 1980 the Authority has assisted sixty-four business organisations by providing 102 units of single detached accommodation dispersed over a wide area of the State.

### Rural Housing Authority

The Rural Housing Authority is established under the provisions of the Rural Housing (Assistance) Act to assist primary producers seeking finance to purchase or build a suitable dwelling or to effect additions to or modernisation of an existing dwelling on their holding.

The Authority consists of four Members of whom one must be a person experienced in the planning, provision and management of housing throughout the State, one who is or has been employed or engaged in a senior capacity by a lending institution involved in making loans to persons engaged in primary industry in the State, one a person who is or has been engaged in the rural industry within the State and one an officer of the State Treasury Department.

The Authority authorises approved lending institutions to make advances to approved primary producers under cover of State Government indemnities, makes direct loans of Authority funds to approved primary producers, and raises funds for the purpose of the Act.

Eligibility for Authority assistance is restricted to persons whose sole or principal activity is the production of essential food and fibre items on their holding. An applicant must satisfy the Authority that the house for which the assistance is required is for himself and his dependants.

A summary of the activities of the Authority since its inception is given in the following table.

RURAL HOUSING AUTHORITY OPERATIONS

Type of assistance	1976-77		1977-78		1978-79		1979-80	
	Number	\$'000	Number	\$'000	Number	\$'000	Number	\$'000
Loans made through permanent building societies	3	51	12	318	11	384	18	342
Direct advances by the Authority	10	256	27	665	15	396	39	1,014

### Defence Service Homes Corporation

Under the *Defence Service Homes Act 1918* the Commonwealth Government provides assistance to certain former and serving members of the Australian Defence Force and other

persons, who meet the eligibility and other specified requirements, to acquire a home by providing long-term loans at concessional rates of interest.

The Scheme is administered by the Defence Service Homes Corporation whose affairs are conducted and controlled by the Secretary to the Department of Veterans' Affairs.

Under the Scheme a loan of up to \$25,000 may be granted over a period which is normally restricted to thirty-two years. Interest payable on initial loans is currently 3.75 per cent per annum on the first \$12,000, 7.25 per cent per annum on further amounts up to \$15,000, and 10.00 per cent per annum on all loan moneys thereafter up to \$25,000. The interest payable on additional loans, when approved, is 10 per cent per annum.

Extensive insurance coverage at competitive premium rates, by way of the co-operative Defence Service Homes Insurance Trust Fund, is an option available to all home owners assisted by the Corporation.

A summary of the Corporation's activities in Western Australia for the six years 1974-75 to 1979-80 is given in the following table.

#### DEFENCE SERVICE HOMES SCHEME — OPERATIONS IN WESTERN AUSTRALIA

Year	Loans granted during year				Total	Net capital expenditure	Principal repayments of loans	Loan accounts at end of period
	Construction of homes	Purchase of new homes	Purchase of previously occupied homes	Enlargement of existing homes				
	No.	No.	No.	No.	No.	\$'000	\$'000	No.
1974 - 75	478	167	676	2	1,323	16,400	5,245	18,378
1975 - 76	400	115	599	7	1,121	16,142	7,515	18,371
1976 - 77	540	43	190	7	780	11,880	7,598	18,117
1977 - 78	446	41	267	9	763	11,049	6,912	17,970
1978 - 79	238	57	236	9	540	7,836	7,848	17,540
1979 - 80	233	33	200	8	474	6,923	8,359	16,971

#### State Housing Death Benefit Scheme Act

The *State Housing Death Benefit Scheme Act 1965-1975* establishes, with effect from 20 February 1965, a scheme to provide benefits for the families of purchasers of dwellings who die leaving unpaid the whole or part of a liability to the State Housing Commission under a contract of sale or mortgage. The benefit is applied to the credit of the deceased purchaser's account, and the instalments payable during the unexpired term of the loan are reduced accordingly.

In 1979-80, twenty-three families of deceased borrowers were assisted, involving an expenditure of \$11,400. From the inception of the scheme in 1965-66 to 30 June 1980, 416 claims have been admitted and a total of \$329,507 paid in the form of assistance to purchasers.

Additional details of the scheme are given on page 204 of the *Western Australian Year Book*, No. 8 — 1969 and in earlier issues.

#### Housing Loan Guarantee Act

The purposes of the *Housing Loan Guarantee Act 1957-1973* are to encourage, through provisions for guarantees and indemnities, the building and the purchasing of new houses. Under this Act, the Government provides guarantees to lenders of funds to building societies and other approved financial organisations making advances to persons desiring to purchase or build their own home on low deposits.

The maximum rate of interest which an approved institution may charge on a loan to a borrower is 11¼ per cent (31 December 1980). Loans may be made up to 90 per cent of the value of the house and land or a specified sum, whichever is the lesser amount. In respect of the Metropolitan Region, the maximum loan permitted is \$32,400, and outside the Metropolitan Region, but south of the 26th parallel it is \$33,300. For a new house situated north of the 26th

parallel and in the North-West or Eastern Land Divisions, the maximum loan is \$51,300 and in the Kimberley Land Division, \$54,000.

Complementary action has been taken by the Commonwealth in establishing the Housing Loans Insurance Corporation to foster high-ratio loans.

### Housing Loans Insurance Scheme

The Housing Loans Insurance Corporation was established by the *Housing Loans Insurance Act 1965* (Commonwealth) to insure approved lenders against losses arising from the making of housing loans. The Corporation consists of a chairman (who is also managing director) and a deputy chairman (who is also deputy managing director) both being full-time members, and three part-time members, all of whom are appointed by the Governor-General.

Operations of the Housing Loans Insurance Corporation were confined to the insurance of first and second mortgage home-ownership loans until June 1977, when an amendment to the Act provided for the Corporation to insure also loans for the purchase of land, for rental accommodation, and for project housing.

On home-ownership loans the Corporation charges a single premium at the outset of the loan. The premium rate varies with the ratio of the loan amount to the value of the property, the average premium being about \$7 per \$1,000 of loan.

The Housing Loans Insurance Corporation is the largest mortgage insurer in both Australia and Western Australia and to 30 June 1980 had insured loans in Western Australia amounting to \$1,336 million. Details of the operations of the Corporation for the six years ended 1979-80 are given in the following table.

HOUSING LOANS INSURANCE CORPORATION  
LOANS INSURED IN WESTERN AUSTRALIA

Particulars		1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Loans insured	No.	4,401	9,657	9,138	6,403	6,473	7,053
Amount of loans insured	\$'000	72,293	199,687	189,947	174,348	185,678	207,872

### Homes Savings Grants and Family Bonus

The purpose of the Commonwealth Government's Home Savings Grants Scheme is to help people to buy or build their first home. The scheme also aims at increasing the proportion of total savings available for housing by encouraging people to save with those institutions that provide the bulk of housing finance. The grant is a tax-free gift, not a loan.

The scheme was introduced in 1964. Persons who acquired their homes up to 31 December 1976 qualified under the *Homes Savings Grant Act 1964*, the details of which are available on page 257 of the *Western Australian Year Book* No. 18 — 1980 and in earlier issues. Grants towards homes acquired from 1 January 1977 are being made under the *Homes Savings Grant Act 1976*.

The present scheme enables a wide range of people to qualify for a grant towards their first home. Married, single, widowed or divorced people may qualify provided the person is over eighteen. A grant may be made towards a new or established house, home unit or flat. The grant is \$1 for each \$3 of acceptable savings held at the prescribed date. The main forms of acceptable savings are those held with savings banks, building societies, credit unions or on fixed deposit with trading banks, or invested in Australian Savings Bonds purchased as inscribed stock or for safe custody with a bank.

The prescribed date is, in general, the date of the contract to buy or build the house, or the date construction commenced. It marks the end of the savings period, and is the date to which eligibility and other conditions are related.

The maximum grants are \$667 and \$1,333 for homes that were acquired in 1977 and 1978 respectively. From 1 January 1979, grants of up to \$2,000 became payable for three years'

savings ending on the prescribed date. However, persons with shorter savings periods of one or two years may continue to qualify for the lower maximum grants of \$667 and \$1,333 respectively.

For persons who contracted to buy or build their first home in Australia from 1 January 1977 to 24 May 1979 there is no qualifying limit on the value of the home. A value limit applies, however, if the prescribed date is on or after 25 May 1979.

The value limit is \$35,000 - \$40,000 for prescribed dates from 25 May 1979 to 18 August 1980, \$45,000 - \$55,000 for prescribed dates from 19 August 1980 to 30 September 1980, and \$60,000 - \$70,000 for prescribed dates on or after 1 October 1980. The grant reduces proportionately within these ranges, cutting out completely at the upper limit in each case. A full grant, depending on the amount saved, is payable for homes valued at less than the relevant value limit range. The Department determines the value of the land, dwelling and other improvements and may accept cost where appropriate.

A person who is eligible for a grant and whose prescribed date is on or after 1 October 1980, may also be eligible for a family bonus. A family bonus of \$500 is payable for families with one dependent child and \$1,000 for families with two or more dependent children at their prescribed date.

Grants approved in Western Australia under the *Homes Savings Grant Act 1976* amounted to \$430,850 for 669 grants during the period 1 January to 30 June 1977, \$2,806,782 for 4,053 grants in 1977-78, \$4,779,795 for 4,684 grants in 1978-79 and \$4,624,027 for 4,054 grants in 1979-80.

### CONTROL OF BUILDING

Each of the local government authorities as constituted under the provisions of the *Local Government Act 1960-1980* has power to exercise general control over the erection of buildings in its own district. The powers of local government authorities to control building derive from the *Town Planning and Development Act* and the *Local Government Act*.

The *Town Planning and Development Act 1928-1980* gives local authorities the right to make town planning schemes and town planning by-laws covering such aspects as the purchase or reservation of land for thoroughfares, the density of dwelling accommodation per hectare, the classification of areas for residential, commercial, industrial and recreational use, the prescription of building standards, and the general planning of new subdivisions. Town planning schemes proposed by a local authority are subject to the approval of the Minister for Town Planning, who has the advice of the Town Planning Board.

The *Local Government Act 1960-1980* contains provisions for the control of building which are compatible with those exercised under the *Town Planning and Development Act* but are in a more detailed form. The Uniform Building By-laws have been applied to most local government areas, and the erection of all buildings must be carried out in compliance with these by-laws. The *Local Government Act* provides that no new building or the alteration of an existing building may be begun before the plans have been approved by the local authority. The Governor may by Order, at the request of a local authority, suspend the operation of this provision in its district. Generally, in remote parts of the State prior approval of plans is required only in the case of building in townsite areas. Where any local authority refuses to approve plans, the Act provides that an appeal may be made to the Minister for Local Government, who has the power to modify or reverse the decision of the local authority. The decision of the Minister is final and not subject to appeal. Other appeals or matters in dispute in relation to the control of building may be determined only by two referees, one of whom is appointed by the Governor and the other by the local authority concerned.

## BUILDING OPERATIONS

Since the end of the second World War, the Australian Statisticians have undertaken a quarterly collection of statistics of building operations. The first of these collections in Western Australia related to the quarter ended 30 September 1945.

Statistics of various series for Western Australia *ab initio* appeared in Part XII of the *Statistical Register of Western Australia* for 1965-66. Most recent data are given in the quarterly publication *Building Operations* and in the annual publication *Building and Housing*.

The collection covers the activities of building contractors who undertake the construction of new buildings; the building operations of Commonwealth Government, State Government, semi-government and local government authorities; and work performed by owner-builders. From the September quarter 1980 a new Building Activity Survey has replaced the previous quarterly Building Operations Census. For further details see the publication *Building Activity*, September and December quarters 1980 (Catalogue No. 8704.5).

The statistics in this section relate only to the erection of buildings as distinct from the construction of railways, bridges, earthworks, etc.

A building is classified as 'private' or 'government' according to ownership at date of commencement. Thus 'government' includes buildings erected for Commonwealth Government, State Government, semi-government and local government authorities, either by contractors or by day labour, whether these buildings are for their own use or for rental or sale after completion. Houses erected for particular persons under government-sponsored home building schemes or with government financial assistance are classified as 'private'.

## NUMBER OF NEW HOUSES AND NEW OTHER DWELLINGS COMPLETED — OWNERSHIP

Year	Private			Government			Total		
	New houses	New other dwellings	Total new dwellings	New houses	New other dwellings	Total new dwellings	New houses	New other dwellings	Total new dwellings
1974 - 75	10,148	2,827	12,975	846	473	1,319	10,994	3,300	14,294
1975 - 76	11,187	2,561	13,748	893	387	1,280	12,080	2,948	15,028
1976 - 77	14,468	5,556	20,024	687	596	1,283	15,155	6,152	21,307
1977 - 78	11,398	4,044	15,442	1,287	637	1,924	12,685	4,681	17,366
1978 - 79	10,401	3,103	13,504	747	404	1,151	11,148	3,507	14,655
1979 - 80	10,953	3,636	14,589	695	520	1,215	11,648	4,156	15,804

VALUE OF BUILDING COMPLETED — CLASS OF BUILDING (a)  
(\$'000)

Class of building	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
New dwellings —						
New houses —						
Material of outer walls —						
Brick, concrete and stone	143,304	194,520	325,652	286,093	272,735	306,444
Brick veneer	34,918	29,507	38,450	57,675	50,276	50,725
Timber	317	892	1,648	4,492	3,209	3,169
Asbestos-cement	19,228	27,581	27,593	24,441	22,011	19,014
Other	838	1,257	1,648	6,058	914	1,582
Total, New houses	198,605	253,756	394,991	378,760	349,145	380,933
New other dwellings	38,882	43,989	113,875	98,949	74,864	93,236
Total, New dwellings	237,487	297,745	508,866	477,709	424,009	474,170



VALUE OF BUILDING COMPLETED — CLASS OF BUILDING (a) — *continued*  
(\$'000)

Class of building	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Alterations and additions (b) to dwellings	4.427	8.714	15.405	21.496	30.512	33.317
Other building —						
Hotels, etc.	9.904	7.461	6.222	5.984	5.639	4.526
Shops	16.655	17.154	22.464	35.490	50.016	42.253
Factories	18.216	22.387	26.640	34.611	43.997	51.514
Offices	18.443	45.695	43.533	18.166	33.250	49.865
Other business premises	16.574	12.066	31.916	22.883	55.296	31.193
Education	39.965	58.285	29.497	46.109	56.349	33.232
Religion	2.031	1.465	1.458	4.002	3.138	2.413
Health	17.341	26.562	27.589	33.237	29.068	30.080
Entertainment and recreation	13.020	9.399	8.992	8.645	14.046	27.773
Miscellaneous	17.958	26.826	28.123	24.920	48.474	29.086
Total, Other building	170.105	227.299	226.433	234.046	339.272	301.934
TOTAL, ALL BUILDING	412.020	533.757	750.705	733.251	793.794	809.421

(a) See text immediately following table. (b) Valued at \$10,000 and over.

In the previous table the value of building completed, classified according to the function each building is intended to serve, is shown for the period 1974-75 to 1979-80. The values shown for each class of building exclude the value of land and represent the estimated value of the building on completion. A 'house' refers only to a single self-contained, detached dwelling unit occupying a separate titled block of land, while 'other dwellings' includes flats and other multi-unit dwelling types previously classified to houses (e.g. duplex or triplex houses, town houses, terrace houses, etc.).

From 1 July 1975, the collection covers all new dwellings irrespective of value, new other building jobs valued at \$10,000 and over, and alterations and additions (both to dwellings and other building) valued at \$10,000 and over. Prior to 1 July 1975 the collection covered new dwellings and new other building jobs valued at \$2,000 and over, and alterations and additions (to both dwellings and other building) valued at \$10,000 and over. In the previous table, the value of new dwellings is shown separately from alterations and additions to dwellings, whereas for other building, new building and alterations and additions are shown together.

As an indication of the distribution of building activity throughout the State, the number of houses completed in each statistical division for the period 1974-75 to 1979-80 is shown in the next table.

NUMBER OF NEW HOUSES COMPLETED IN STATISTICAL DIVISIONS

Statistical division (a)	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Perth Statistical Division	7,827	9,053	11,755	9,092	8,036	8,053
Other divisions —						
South-West	879	1,026	1,293	1,274	1,202	1,470
Lower Great Southern	268	256	327	419	424	459
Upper Great Southern	155	136	149	142	117	128
Midlands	392	452	372	349	283	339
South-Eastern	327	221	200	273	139	191
Central	375	458	619	437	379	406
Pilbara	722	408	370	624	465	447
Kimberley	49	70	70	75	103	155
Total	3,167	3,027	3,400	3,593	3,112	3,595
WESTERN AUSTRALIA	10,994	12,080	15,155	12,685	11,148	11,648

(a) Statistical divisions and their component local government areas were revised with effect from 1 January 1976 (see maps inside back cover). Details of the number of new houses completed prior to this date have been recalculated on the new area basis.

**VALUE OF WORK DONE ON BUILDING**  
(\$'000)

Class of building	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
New dwellings —						
New houses	193,894	286,442	402,296	364,661	349,409	381,995
New other dwellings	33,650	64,802	113,146	92,399	73,811	95,816
Total. New dwellings	227,544	351,243	515,442	457,060	423,220	477,811
Alterations and additions (a) to dwellings	5,562	8,432	16,264	22,562	31,863	32,785
Other building —						
Hotels, etc.	10,659	5,557	6,870	6,281	4,230	6,655
Shops	17,520	19,185	23,762	41,573	44,675	48,684
Factories	18,687	23,625	42,325	43,322	43,248	37,111
Offices	39,274	28,744	18,598	22,704	41,247	73,175
Other business premises	19,643	17,320	34,935	31,206	36,710	31,447
Education	48,481	44,590	32,285	47,868	51,447	35,103
Religion	2,017	1,699	1,635	4,051	2,463	2,612
Health	28,788	26,472	32,388	39,267	39,963	64,624
Entertainment and recreation	10,274	9,084	9,248	9,236	17,865	27,087
Miscellaneous	22,088	26,927	24,885	40,654	37,643	22,502
Total. Other building	217,429	203,203	226,932	286,164	319,492	349,000
TOTAL, ALL BUILDING	450,535	562,878	758,638	765,785	774,574	859,596

(a) Valued at \$10,000 and over.

A further measure of building activity is that of 'value of work done' which is the estimated value of work actually carried out on buildings during the period. For any building, the sum of these values obtained during its construction equals the value of the building on completion. The figures in the previous table include estimates for the value of work done on owner-built houses.

### Employment in Building

From 1 July 1978 details of building employment are no longer available. Information relating to years prior to this is given on page 260 of the *Western Australian Year Book*, No. 18 — 1980 and in earlier issues.

### DWELLINGS COMPLETED IN AUSTRALIA

The following table shows the numbers of new houses and new other dwellings completed in each of the Australian States and Territories during the year 1979-80. In Western Australia the number of new houses and new other dwellings completed per thousand of mean population was 12.61 compared with 8.55 in the rest of Australia and 8.90 in Australia as a whole.

The total number of new dwellings completed in Western Australia per thousand of mean population showed an increase compared with the previous year when the figures were 11.90 for this State, 7.82 in the rest of Australia and 8.17 in Australia as a whole.

#### NEW HOUSES AND NEW OTHER DWELLINGS COMPLETED AUSTRALIAN STATES AND TERRITORIES: 1979-80

State or Territory	New houses	New other dwellings (a)	Total new dwellings (a)		
			Total number completed	Proportion of Australian total (per cent)	Per thousand of mean population
New South Wales	31,549	10,519	42,068	32.54	8.23
Victoria	22,617	4,323	26,940	20.84	6.96
Queensland	22,484	6,699	29,183	22.58	13.13
South Australia	6,651	1,654	8,305	6.42	6.41
Western Australia	11,648	4,156	15,804	12.23	12.61
Tasmania	2,721	882	3,603	2.79	8.57
Northern Territory	989	361	1,350	1.04	11.39
Australian Capital Territory	1,398	617	2,015	1.56	8.98
AUSTRALIA	100,057	29,211	129,268	100.00	8.90

(a) Individual dwelling units.

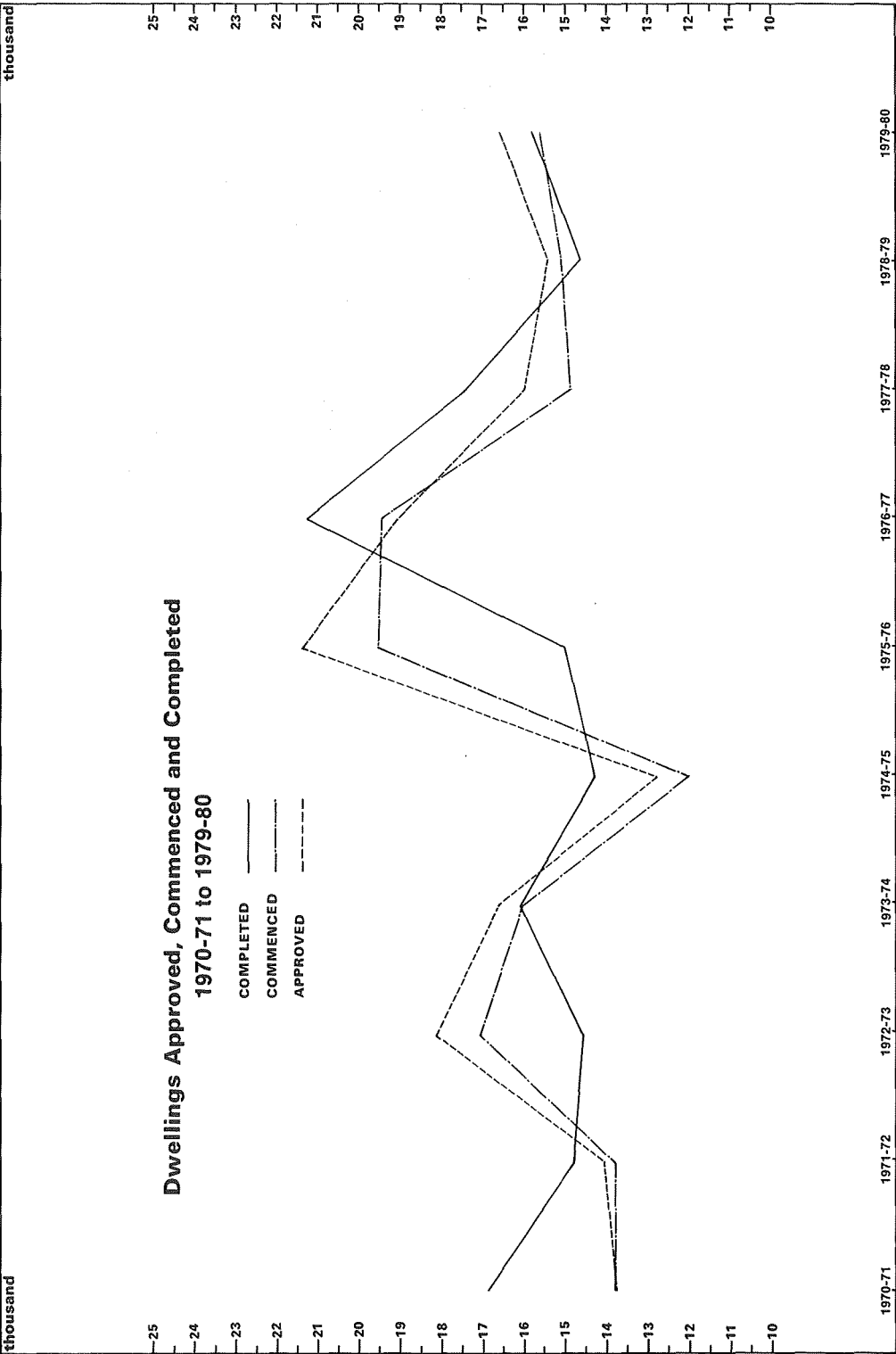
## CONSTRUCTION (OTHER THAN BUILDING) OPERATIONS

The first of the collections of statistics of Construction (other than building) operations in Western Australia related to the half-year ended June 1973. The collection was expanded to a quarterly basis beginning with the September quarter 1976 and relates to the construction of roadworks, railways, bridges, water supply, etc. as distinct from the erection of buildings.

NUMBER AND VALUE OF CONSTRUCTION (OTHER THAN BUILDING)  
PRIME CONTRACTS BY STAGE OF CONSTRUCTION

Period	Commenced		Completed		Under construction		Work done during period	Work yet to be done
	Number	\$m	Number	\$m	Number	\$m	\$m	\$m
1974 - 75	169	148	109	66	223	376	137	159
1975 - 76	120	110	162	168	173	351	135	132
1976 - 77	167	111	129	102	362	739	107	385
1977 - 78	254	296	226	149	528	1,163	238	626
1978 - 79	186	120	221	290	448	1,125	249	343
1979 - 80	215	632	173	138	395	1,828	160	610

The survey covers the activities of private contractors undertaking construction (other than building) prime contracts valued at \$100,000 or more at commencement of the contract. Construction undertaken by government authorities involving their own work forces, and construction on their own account by enterprises in the private sector, are excluded.



## **Part 6 — Law, Order and Public Safety**

The law in force in Western Australia is contained in The Statutes of Western Australia, comprising legislation passed by the Western Australian Parliament and certain Imperial Acts which have been adopted, and in the Commonwealth Acts in so far as they apply to Western Australia. Under the Constitution of the Commonwealth of Australia, 'when a law of a State is inconsistent with a law of the Commonwealth, the latter shall prevail, and the former shall, to the extent of the inconsistency, be invalid'.

### **The Legal Profession**

The Barristers' Board, constituted under the *Legal Practitioners Act 1893-1979*, comprises the Attorney-General as chairman; the Solicitor-General; all Queen's Counsel permanently residing and practising in the State; and seven practitioners of at least three years' standing and practice in the State, elected annually by the practitioners on the roll of the Supreme Court residing and practising in the State.

The Board has the power to regulate and control the examination and admission of articulated clerks, and the examination of all candidates for admission as practitioners. The certificate of the Board is necessary before any person may be admitted to practice. An applicant for admission having qualifications acquired outside Western Australia must satisfy the Board that he possesses qualifications substantially equivalent to those required for the admission of persons who qualify in Western Australia.

### **Crown Law Department**

The Crown Law Department is administered, subject to the control of the Attorney-General, by the Under Secretary for Law. The Department is responsible for the Supreme Court Central Office, the District Court Registry, the Family Court Registry, Court Offices throughout the State (except Children's Courts), the Crown Solicitor's Office, the Office of Titles, the Public Trust Office, the Corporate Affairs Office, and the Probation and Parole Service. The Department, in addition to administering the Acts which come under the portfolio of the Attorney-General, conducts Crown legal business and, when required, acts for and advises all other State Government Departments and instrumentalities.

### **Law Reform Commission of Western Australia**

The Law Reform Commission of Western Australia was established by the *Law Reform Commission Act 1972-1978* which came into force on 19 January 1973. The Commission has five members, two full-time members and three part-time members. The full-time members must be or have been legal practitioners in Australia for at least eight years or have other suitable legal qualifications and experience. Of the part-time members one must be a legal practitioner practising as such in Western Australia; one must be engaged in teaching law at a University in Western Australia; and one must be a legal officer of the Western Australian Crown Law Department.

The Commission examines proposals for review of aspects of the law referred to it by the Attorney-General. It may also submit to the Attorney-General proposals for review. The Commission usually issues a working paper discussing the issues involved in a particular proposal under consideration and invites comments from interested persons. A report is then made to the Attorney-General.

During the year ended 30 June 1980 the Commission issued reports on: Defamation; Privilege for Journalists; Retention of Court Records; and Exemption from Jury Service.

### **Parliamentary Commissioner for Administrative Investigations**

The *Parliamentary Commissioner Act 1971-1976*, which came into operation on 12 May 1972, provides for the appointment of a Parliamentary Commissioner for Administrative Investigations with the powers of a Royal Commission as specified in the *Royal Commissions Act 1968*. The first Commissioner was appointed on 24 April 1972.

The Commissioner (commonly known as the ombudsman) is empowered to investigate administrative actions taken by or on behalf of certain government authorities. The Act applies to all Departments of the Public Service, excluding officers of the establishment of the Governor and of the Agent General for Western Australia (London), to all local government authorities, and to other specified authorities. It does not apply to the Supreme Court of Western Australia, The District Court of Western Australia, other courts of law in the State, a Judge of the Supreme Court or of the District Court, a commissioner of any court, a stipendiary magistrate, a coroner, the Auditor-General, the Parliamentary Privileges Act, or any decision of the Cabinet or of a Minister of the Crown.

## **LAW COURTS**

The principal courts operating in Western Australia are the High Court of Australia, the Supreme Court of Western Australia, The District Court of Western Australia, the Family Court of Western Australia, the Magistrates' and Coroners' Courts and the Licensing Court of Western Australia. In Chapter X, Part 1, reference is made to the Federal Court of Australia, the Australian Conciliation and Arbitration Commission, the Western Australian Industrial Appeal Court, and The Western Australian Industrial Commission.

### **High Court of Australia**

The High Court of Australia is the Federal Supreme Court and its powers are defined in the Commonwealth of Australia Constitution Act and in the *Judiciary Act 1903*. The High Court consists of a Chief Justice and six other Justices. Sittings are held in the capital city of each State as occasion may require. The High Court exercises both original and appellate jurisdiction, acting as a court of appeal for Australia.

An appeal may lie from a judgment of the High Court of Australia to the Judicial Committee of the Privy Council in London. However, the *Privy Council (Limitation of Appeals) Act 1968* (Commonwealth) limits the matters which may be the subject of special leave of appeal from a decision of the High Court. The Act provides, in part, that leave of appeal 'may be asked only in a matter in which the decision of the High Court was a decision that (a) was given on appeal from a decision of the Supreme Court of a State given otherwise than in the exercise of federal jurisdiction; and (b) did not involve the application or interpretation' of the Commonwealth Constitution, or of a Commonwealth law (including any ordinance, rule, regulation or by-law made under such a law).

### **Supreme Court of Western Australia**

The Supreme Court of Western Australia, as constituted under the *Supreme Court Act 1935-1979*, consists of a Chief Justice and such other Judges, not exceeding six in number, as may from time to time be appointed. The jurisdiction of the Court in both civil and criminal matters is exercised by a single Judge, sitting alone or with a jury, unless it is provided that an action must be brought before a Full Court. Criminal cases are heard before a jury. Criminal sittings of the Supreme Court are held at Perth each month from February to December, and also in January if the Chief Justice so directs. Civil sittings and Full Court sittings are held at times fixed by the Court from year to year. There are regular sittings at Albany, Bunbury, Geraldton and Kalgoorlie, and at other country centres as required.

Any two or more Judges together comprise a Full Court except that when sitting as a court of criminal appeal there must be an uneven number of Judges. Appeals are heard against judgments of the Supreme Court and the District Court as well as against decisions of the magistrates in the Courts of Petty Sessions.

Appeal from a judgment of the Supreme Court of Western Australia lies to the High Court of Australia, subject to the provisions of the *Judiciary Act* 1903 (Commonwealth), and may also be made direct to the Privy Council.

### **The District Court of Western Australia**

The District Court of Western Australia is constituted under the provisions of the *District Court of Western Australia Act 1969-1978* and consists of a Chairman of Judges and such other Judges as may from time to time be appointed. The Act, which came into operation on 1 April 1970, repealed the *Courts of Session Act 1921*. The jurisdiction of the Court is exercised by a Judge sitting alone or with a jury. Criminal cases must be heard before a Judge and jury. Criminal sittings of the District Court are held at Perth each month from January to December, five times a year at Albany, Bunbury, Geraldton and Kalgoorlie, and at other centres when required. Civil sittings are held concurrently with criminal sittings in Perth, and immediately following the criminal sittings at other centres except at Bunbury where special civil sittings are held four times a year.

Civil jurisdiction exists broadly up to a maximum of \$20,000, and criminal jurisdiction in respect of indictable offences except those for which the maximum penalty exceeds fourteen years' imprisonment.

Appeals from a District Court Judge lie, in the civil jurisdiction, to the Full Court of the Supreme Court and, in the criminal jurisdiction, to the Court of Criminal Appeal.

### **Family Court of Western Australia**

The Family Court of Western Australia which came into operation on 1 June 1976 is constituted under the provisions of the *Family Court Act 1975-1979*. The Court consists of a Chairman of Judges and such other Judges as may from time to time be appointed. The jurisdiction of the Court is exercisable by one Judge.

The Court has throughout the State the federal jurisdiction with which it is invested by the *Family Law Act 1975* (Commonwealth) and non-federal jurisdiction conferred on it by, or under any Act of the State.

Appeals in respect of federal jurisdiction matters lie to the Full Court of the Family Court of Australia; and appeals in respect of non-federal jurisdiction matters lie to the Full Court of the Supreme Court of Western Australia.

### **Magistrates' and Coroners' Courts**

In addition to their usual functions, magistrates act as coroners and mining wardens where required. Two or more Justices of the Peace sitting together in petty sessions may deal with cases which could be decided by a magistrate sitting alone.

**COURTS OF PETTY SESSIONS.** Courts of Petty Sessions, which are established in terms of the *Justices Act 1902-1980*, are held at centres of population throughout the State. Minor offences are dealt with summarily, but a person charged with an indictable offence may be committed to a higher court for trial or sentence if there is sufficient evidence to justify this course.

**CHILDREN'S COURTS.** The *Child Welfare Act 1947-1979* provides for the establishment of Children's Courts, and the appointment of special magistrates, to deal with offenders under the age of eighteen years and to hear certain specified cases of offences against children. Certain cases of offences concerning children may be remanded for hearing or committed for sentence before the Supreme Court. The public may be excluded from Children's Court hearings and names of juvenile offenders are withheld from publication unless with the express authority of

the Court. Children's Courts operate in Perth, and at other centres as required. Further reference to Children's Courts appears in the section *Child Welfare* in Part 4 of this Chapter.

**LOCAL COURTS.** Local Courts, which are established in terms of the *Local Courts Act 1904-1976*, are held throughout the State to determine minor civil issues, largely the recovery of small debts. Jurisdiction is limited in most cases to claims not exceeding \$3,000.

**CORONERS' COURTS.** The powers of coroners are derived from the *Coroners Act 1920-1979*. Coroners' Courts may be held to inquire into the circumstances of sudden, unnatural and suspected deaths or the cause and origin of fires. A coroner may charge a person with a major offence and commit him for trial at a higher court.

### Licensing Court of Western Australia

The Licensing Court of Western Australia is established under the provisions of the *Liquor Act 1970-1979*. The Court comprises three members, including a chairman, appointed by the Governor. Except as otherwise provided by the Act, the Court may be constituted, and its jurisdiction may be exercised, by any two members. The Court has exclusive jurisdiction to hear and determine all applications under the Liquor Act in respect of licences, provisional certificates and permits relating to the sale, supply and consumption of liquor. Appeal against a direction, determination or order of the Court lies to the Supreme Court, but only where the appeal involves a question of law.

### Small Claims Tribunals

The *Small Claims Tribunals Act 1974-1978* provides for the establishment of Small Claims Tribunals and the appointment of referees to deal with claims involving an amount less than \$1,000. A Tribunal is constituted by a referee sitting alone and may be constituted at any place in the State. Settlements or orders made by a referee are final and binding on all parties to a proceeding.

## COURT PROCEEDINGS

### Higher Courts

The term *Higher Courts* refers to courts presided over by a Judge. The general jurisdiction of the higher courts includes appeals from the lower courts, cases of crime committed from lower courts, and civil cases. Under the *Bankruptcy Act 1966* (Commonwealth) the Supreme Court of Western Australia is invested with jurisdiction in bankruptcy. Prior to the constitution of the Family Court of Western Australia which came into operation on 1 June 1976 the Supreme Court was also vested with jurisdiction in divorce and related matters under the *Matrimonial Causes Act 1959* (Commonwealth) and the *Family Law Act 1975* (Commonwealth).

### Civil Proceedings

Particulars of civil cases, with the exception of bankruptcy cases, dealt with by the courts in the six years ended 31 December 1979 are shown in the following table.

#### COURTS — CIVIL PROCEEDINGS

Particulars	1974	1975	1976	1977	1978	1979
<b>SUPREME COURT OF WESTERN AUSTRALIA —</b>						
Actions —						
Writs of Summons issued	951	1,153	1,401	891	944	1,027
Actions listed for trial	158	160	182	202	197	184
Actions settled without trial	45	44	62	82	80	80
Actions heard	88	75	75	117	120	104
Other originating processes —						
Originating summons	347	400	296	296	288	270
Petitions —						
In bankruptcy (creditors)	36	36	25	23	41	48
Companies Act	38	46	30	58	111	97



COURTS — CIVIL PROCEEDINGS — *continued*

Particulars	1974	1975	1976	1977	1978	1979
<b>SUPREME COURT OF WESTERN AUSTRALIA —</b>						
<i>continued</i>						
Judgments —						
With trial	79	63	50	83	114	90
Without trial	170	127	156	97	137	177
Amounts awarded	\$'000 4,466	4,534	4,273	10,246	7,208	6,217
Divorce (a) —						
Number of —						
Petitions filed	2,232	2,707	(b)	(b)	(b)	(b)
Decrees granted	1,761	2,241	1,774	203	55	(b)
<b>THE DISTRICT COURT OF WESTERN AUSTRALIA —</b>						
Number of —						
Writs commencing actions	4,366	4,391	4,664	2,719	3,663	4,097
Judgments —						
With trial	177	115	126	190	114	167
Without trial	1,789	1,957	2,222	2,147	1,486	1,771
Amounts awarded	\$'000 6,806	8,750	9,871	11,140	12,701	17,109
<b>FAMILY COURT OF WESTERN AUSTRALIA (b) —</b>						
Dissolution of marriage —						
Number of —						
Applications filed	..	..	2,634	3,950	3,485	3,269
Decrees made	..	..	2,861	3,761	3,327	3,397
<b>LOCAL COURTS —</b>						
Number of —						
Plaints entered	68,013	62,561	56,542	56,182	65,791	72,642
Verdicts for plaintiffs	24,421	23,865	19,839	19,443	23,128	26,213
Amounts awarded	\$'000 5,224	4,705	4,191	6,378	9,857	13,780
<b>CORONERS' COURTS —</b>						
Number of —						
Inquests	173	229	251	187	160	151
Inquiries	n.a.	n.a.	n.a.	1,912	1,806	1,899

(a) Figures relate to petitions and decrees for dissolution of marriage, nullity of marriage, and judicial separation. (b) The Family Court commenced operation on 1 June 1976.

## CONVICTIONS IN COURTS

## Number of Convictions

It is important to bear in mind when considering the particulars shown in the following tables that the figures relate to the *number of convictions* recorded and not to the *number of persons* convicted. Thus, where a person is convicted on more than one count each conviction so recorded has been included in the statistics.

## HIGHER COURTS AND MAGISTRATES' COURTS — NUMBER OF CONVICTIONS

Class of offence	1974	1975	1976	1977	1978	1979
<b>HIGHER COURTS</b>						
Offences against the person —						
Murder	6	5	9	5	10	20
Attempted murder	4	2	2	—	7	5
Manslaughter	28	15	24	11	17	6
Negligent driving causing death	5	6	9	4	8	8
Sex offences	48	56	57	25	67	78
Assault	36	42	71	63	49	78
Other	14	16	24	19	30	21
Total	141	142	196	127	188	216
Offences against property —						
Breaking, entering and stealing	231	354	148	417	427	673
Stealing, receiving	151	187	253	352	297	354
Other	75	101	115	62	112	118
Total	457	642	516	831	836	1,145
Forgery and offences against the currency	16	51	7	27	3	19
Offences against good order	41	34	66	129	147	194
Other offences	25	12	33	40	30	10
GRAND TOTAL	680	881	818	1,154	1,204	1,584

HIGHER COURTS AND MAGISTRATES' COURTS — NUMBER OF CONVICTIONS — *continued*

Class of offence	1974	1975	1976	1977	1978	1979
MAGISTRATES' COURTS (a)						
Offences against the person —						
Sex offences	239	218	170	175	147	109
Assault	1,851	1,945	2,067	2,056	2,105	2,253
Other	7	9	27	33	21	45
Total	2,097	2,172	2,264	2,264	2,273	2,407
Offences against property —						
Breaking, entering and stealing	4,441	4,242	4,421	3,570	3,881	3,815
Unlawfully on premises	798	548	555	653	671	747
Stealing, receiving	8,372	7,084	7,425	7,478	9,134	10,170
Unlawfully using motor vehicles	3,042	2,806	2,684	2,583	2,195	1,639
Wilful damage	1,469	1,341	1,514	1,358	1,590	1,617
Other	83	71	76	106	210	93
Total	18,205	16,092	16,675	15,748	17,681	18,081
Forgery and offences against the currency	306	262	557	378	360	505
Offences against good order —						
Drunkenness	16,142	12,096	10,237	10,289	11,393	11,100
Disorderliness	4,458	4,586	4,536	4,788	4,892	5,293
Vagrancy	588	481	353	176	231	515
Escaping legal custody	297	329	443	401	347	375
Offences against police	1,781	1,917	2,217	2,016	1,761	2,639
Other	732	927	1,175	1,395	886	1,167
Total	23,998	20,336	18,961	19,065	19,510	21,089
Other offences —						
Breach of —						
Traffic Act (b)	52,607	59,852	50,932	44,176	50,235	56,310
Liquor laws	1,735	1,861	2,189	1,979	2,541	2,754
Health laws	337	280	213	147	201	134
Gaming	442	381	702	707	744	535
Industrial offences	28	69	69	22	64	231
Maintenance offences	1,705	1,640	(c) 22	(c) 141	(c) 7	(c) 34
Taxation offences	1,893	2,553	1,454	2,532	2,447	2,820
Other offences	6,058	5,980	8,517	7,664	9,073	6,964
Total	64,805	72,616	64,098	57,368	65,312	69,782
GRAND TOTAL	109,411	111,478	102,555	94,823	105,136	111,864

(a) Including Children's Courts. (b) Excludes minor traffic offences not subject to court process. (c) Offences heard under *Family Law Act* 1975, operative from 5 January 1976, are not included.

## Summary of Convictions in Courts

The following table gives a summary of convictions in courts in Western Australia during each of the six years to 31 December 1979 together with an analysis, according to class of offence, of convictions recorded during the year ended 31 December 1979.

## HIGHER COURTS AND MAGISTRATES' COURTS — NUMBER OF CONVICTIONS

Particulars	Higher Courts			Magistrates' Courts		
	Males	Females	Total	Males	Females	Total
Year —						
1974	651	29	680	95,687	13,724	109,411
1975	803	78	881	98,578	12,900	111,478
1976	768	50	818	90,900	11,655	102,555
1977	1,119	35	1,154	n.a.	n.a.	94,823
1978	1,149	55	1,204	n.a.	n.a.	105,136
1979	1,513	71	1,584	n.a.	n.a.	111,864
1979 —						
Class of offence —						
Against the person	208	8	216			2,407
Against property	1,102	43	1,145			18,081
Forgery, etc.	19	—	19	n.a.	n.a.	505
Against good order	174	20	194			21,089
Other offences	10	—	10			69,782
Total	1,513	71	1,584	n.a.	n.a.	111,864

Regulations under the Traffic Act (now repealed) allowed fines to be imposed without court action for minor traffic offences. These provisions are continued under the *Road Traffic Act 1974-1980*. Similar provisions apply under parking facilities legislation and municipal by-laws. These minor offences (which are, of course, excluded from the tables relating to court convictions) numbered 271,266 in 1974, 265,096 in 1975, 315,953 in 1976, 306,885 in 1977, 307,396 in 1978 and 333,545 in 1979.

### LIQUOR LICENCES

The following table shows the number of liquor licences of the several types in force in Western Australia under the provisions of the *Liquor Act 1970-1979*.

#### LIQUOR LICENCES IN FORCE

Type of licence (a)	At 30 June —					
	1975	1976	1977	1978	1979	1980
Australian wine	21	20	15	13	8	6
Brewer's	4	4	4	5	5	4
Cabaret	27	27	27	28	32	35
Canteen	28	30	33	34	32	33
Club	286	296	307	313	316	321
Hotel	459	400	386	383	383	381
Limited hotel	24	24	25	25	24	26
Packet	11	11	11	14	20	21
Restaurant	101	109	117	134	156	168
Store	296	300	316	325	328	330
Tavern	47	131	158	170	175	184
Theatre	4	3	3	4	5	5
Vigneron's	—	—	—	—	2	4
Wholesale	60	59	58	65	69	73
Winehouse	18	15	13	12	12	15
Total	1,386	1,429	1,473	1,525	1,567	1,606

(a) As described in the *Liquor Act 1970-1979*.

By a provision of the *Government Railways Act 1904-1980*, The Western Australian Government Railways Commission is authorised to lease railways premises for the sale of refreshments, subject to the provisions of the *Liquor Act 1970-1979*.

A licence applying to premises at Perth International Airport is issued in terms of the *Airports (Business Concessions) Act 1959* (Commonwealth).

### POLICE

The Western Australian Police Force comprises five main branches under the direction of the Commissioner of Police. The Commissioner is appointed by the Governor under the provisions of the *Police Act 1892-1980* and is responsible to the Minister for Police.

For the administration of the Uniformed Branch, the State is divided into three metropolitan regions, four metropolitan divisions and eight country regions, each under the direction of a commissioned officer. At 30 June 1980 there were, in addition to the Uniformed Branch, a number of specialised branches and sections, including the Criminal Investigation Branch, 79 Division, the Liquor and Gaming Branch, the Firearms Branch, the Traffic Patrol, the Prosecuting Branch, the Public Relations and Lecturing Branch, the Communications Branch, the Scientific Branch, the Training Branch, the Recruiting Branch, the Planning and Research Section, the Electronic Data Processing Section, and Police and Citizens' Youth Clubs.

The Uniformed Branch comprises the main body of the Police Force and is responsible for the routine maintenance of law and order throughout the State. Where required, officers of the Branch act as Clerks of Courts and perform special duties for other government authorities.

Women in the Police Force participate in all facets of police duties. At 30 June 1980 seventy-five women police officers were employed.

The Criminal Investigation Branch is centred in Perth, with several sub-branches in the metropolitan area and the principal country towns. The Branch is primarily concerned with the investigation of serious crimes and the apprehension of offenders. In September 1979, 79 Division, a combined squad of detectives and general uniformed staff, was formed to provide a patrol service capable of attending complaints of any nature within the Perth Region.

The Commercial Agents Squad investigates matters relating to land agents, auctioneers, money-lenders, inquiry agents, employment brokers, debt collectors, security agents and guards, installers and technicians of intruder alarm systems and security devices. This squad is comprised of plain-clothed general duties officers attached to the Criminal Investigation Branch.

The Communications Branch is responsible for the police radio-communications network and provides a new and vital link with available data base information.

The Scientific Branch is responsible for matters relating to fingerprint, photography, video, criminal records, Central Warrant Bureau, ballistics, hazardous devices, handwriting and document examination and various technical and scientific aids to investigation.

The Liquor and Gaming Branch is concerned mainly with the enforcement of the liquor laws and laws for the suppression of gaming and distribution of pornographic literature and articles.

The Firearms Branch is responsible for the licensing of firearms throughout the State.

The Traffic Patrol assists the Road Traffic Authority in the administration and enforcement of traffic laws.

The Planning and Research Section surveys and assesses present and future police requirements, equitable and effective distribution of resources, land, buildings and housing requirements.

The Prosecuting Branch conducts police prosecutions in Children's Courts and Courts of Petty Sessions in the metropolitan area, at Bunbury, Geraldton, Kalgoorlie and Port Hedland and, when required, at other centres.

The Public Relations and Lecturing Branch is responsible for maintaining a satisfactory relationship with the public and the news media. Lectures are given to children and students from kindergarten to tertiary education level and also to minor offenders against the traffic and liquor laws.

Police and Citizens' Youth Clubs are established by the Police Department to provide recreational facilities for young people and to give them an appreciation of civic responsibilities.

#### POLICE FORCE — NUMBER AND CLASSIFICATION (a)

Date of classification	Branch and number of officers							Total (a)
	General Uniformed Branch	Women Police	Criminal Investigation Branch	Liquor and Gaming Branch	Firearms Branch	Traffic Patrol	Other Branches	
At 30 June —								
1975	1,320	38	210	42	16	387	161	2,174
1976	1,252	35	239	45	17	503	191	2,282
1977	1,265	33	283	46	12	491	209	2,339
1978	1,284	(b)	335	48	11	543	263	2,484
1979	1,316	(b)	355	48	13	548	272	2,552
1980 —								
Superintendent	18		4	1	1	5	4	33
Senior Inspector	16		4	—	—	6	5	31
Inspector	20	(b)	5	—	—	9	3	37
Sergeant	259		133	7	4	109	89	601
Constable	1,018		234	43	7	443	190	1,935
Total	1,331	..	380	51	12	572	291	2,637

(a) In addition to the numbers shown there were, at 30 June 1975 a Commissioner of Police, a Senior Assistant Commissioner, three Assistant Commissioners, and a Chief Superintendent; from 30 June 1979 there were a Commissioner of Police, a Senior Assistant Commissioner and four Assistant Commissioners. (b) The Women Police ceased operation as a separate branch on 8 August 1977.

## PRISONS

Under the provisions of the *Prisons Act 1903-1979*, the Director of the Department of Corrections is responsible, subject to the control of the Minister, for the administration of prisons in Western Australia. In addition there is a police gaol at East Perth administered jointly by the Department of Corrections and the Police Department.

The main institution is Fremantle Prison (maximum security) and there are regional prisons at Albany (maximum/medium security), Boulder (minimum security), Broome (medium security), Geraldton (minimum security), Roebourne (medium security) and Wyndham (minimum security). Barton's Mill Prison, Brunswick Junction Prison, Karnet Rehabilitation Centre, Pardelup Prison Farm and Wooroloo Training Centre are minimum security institutions. Bunbury Regional Prison, Bandyup Women's Training Centre (the main prison for females) and Kalgoorlie Regional Prison, which has largely been replaced by the new Eastern Goldfields minimum security regional prison at Boulder, are medium security institutions. At Canning Vale the ninety-eight bed C.W. Campbell Remand Centre was opened in May 1980 and the 248-bed maximum security prison was commissioned on 27 November 1981. West Perth Work Release Hostel caters for male work release prisoners, with a small hostel at Highgate catering for females.

The following table shows the number of receivals for penal imprisonment in gaols in Western Australia during each of the six years to 30 June 1980. It is important to note that the figures relate to *receivals* and not to *distinct persons*, i.e. a prisoner has been counted once for each time he or she was received.

PENAL IMPRISONMENT — NUMBER OF RECEIVALS (a)

Institution	Year ended 30 June —											
	1975		1976		1977		1978		1979		1980	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
Prisons —												
Fremantle (b)	1,789	..	1,344	..	1,129	..	1,062	..	1,455	..	1,271	(c) ..
Albany	128	—	225	1	97	—	79	—	108	—	112	—
Bandyup Training Centre	..	155	..	204	..	127	..	120	..	158	..	(c) 190
Broome	153	25	169	10	475	80	367	74	209	34	235	25
Brunswick Junction	146	..	106	..	38	..	35	..	32	..	41	..
Bunbury Rehabilitation Centre	34	..	218	..	129	..	85	..	151	..	120	..
Byford Inebriates Centre (d)	39	..	..	..	..	..	..	..	..	..	..	..
Geraldton	450	15	471	13	349	27	259	13	335	26	323	16
Kalgoorlie	573	131	316	32	349	47	369	49	401	73	402	62
Roebourne (b)	..	..	204	29	268	111	287	135	280	77	295	79
West Perth Work Release Hostel	..	..	..	..	..	..	..	..	..	..	1	..
Wooroloo Training Centre	531	..	403	..	259	..	244	..	183	..	328	..
Wyndham (f)	133	25	180	20	238	70	221	32	198	37	213	55
Total	3,976	351	3,636	309	3,331	462	3,008	423	3,352	405	3,341	427
Police gaols	1,555	577	504	213	106	4	17	—	39	—	67	—
GRAND TOTAL	5,531	928	4,140	522	3,437	466	3,025	423	3,391	405	3,408	427

(a) Excludes imprisonment for debt and receivals of persons on remand. (b) Includes figures for Barton's Mill Prison, Karnet Rehabilitation Centre and Pardelup Prison Farm. (c) One transexual prisoner was received at Fremantle but was later taken to Bandyup. (d) Closed 1 June 1975. (e) Opened 12 March 1976. (f) Replaced the Wyndham police gaol on 4 March 1975.

Work and educational opportunities vary from prison to prison. All prisons employ some prisoners in maintenance, cleaning and cooking tasks, whilst at the larger and better equipped institutions, workshops provide additional employment and some training in such areas as carpentry, sheetmetal work, welding and motor mechanics. The farms provide employment and some training in various aspects of agriculture. Full or part-time educational facilities are

available at Albany, Pardelup, Bunbury, Brunswick, Fremantle, Bandyup, Broome and Wyndham. Work release prisoners are located either at the institution at which they are serving their sentence or are transferred to West Perth in the case of males or Highgate in the case of females.

The police gaol at East Perth holds prisoners awaiting trial and some short-term prisoners. In addition, provision is made for holding some prisoners with very short sentences at police lock-ups throughout the State.

The following table shows the number of prisoners, excluding trial and remand prisoners and debtors, in gaols in Western Australia at 30 June in each year from 1975 to 1980.

#### PRISONERS IN GAOL

Institution	At 30 June —											
	1975		1976		1977		1978		1979		1980	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
Prisons —												
Fremantle	346	..	348	..	395	..	396	..	526	..	533	..
Albany	33	—	38	—	48	—	57	—	63	—	62	—
Bandyup Training Centre	..	24	..	35	..	29	..	37	..	(a) 57	..	(a) 38
Barton's Mill (b)	17	..	..	..	..	..	55	..	70	..	80	..
Broome	24	—	33	—	40	3	22	—	26	1	59	2
Brunswick Junction	18	..	23	..	15	..	22	..	26	..	16	..
Bunbury Rehabilitation Centre	56	..	37	..	63	..	62	..	71	..	64	..
C. W. Campbell Remand Centre (c)	..	..	..	..	..	..	..	..	..	..	20	..
Geraldton	58	—	55	2	90	2	75	—	79	1	75	3
Kalgoorlie	39	1	26	1	36	2	40	—	38	4	32	4
Karnet Rehabilitation Centre	59	..	65	..	71	..	79	..	73	..	87	..
Pardelup Prison Farm	29	..	30	..	27	..	50	..	56	..	42	..
Roebourne (d)	..	..	25	2	23	3	28	2	53	—	51	1
West Perth Work Release Hostel (e)	24	..	29	..	32	..	29	(a) 6	32	..	30	..
Wooroloo Training Centre	71	..	103	..	103	..	108	..	123	..	118	..
Wyndham (f)	20	1	10	—	24	2	30	—	19	—	18	1
Total	794	26	822	40	967	41	1,053	45	1,255	63	1,287	49
Police gaols	35	12	11	—	22	2	22	—	14	—	(g) 23	—
GRAND TOTAL	829	38	833	40	989	43	1,075	45	1,269	63	1,310	49

(a) Includes Highgate Annexe. (b) Closed 31 October 1975, re-opened 31 October 1977. (c) Opened 1 May 1980.  
 (d) Opened 12 March 1976. (e) Opened 19 October 1974. (f) Opened 5 March 1975. (g) Includes six persons in public hospitals.

#### PROBATION AND PAROLE SERVICE

The Probation and Parole Service, a branch of the Crown Law Department, is constituted under the provisions of the *Offenders Probation and Parole Act 1963-1977*. Parole was brought into operation on 1 October 1964, probation on 1 January 1965 and community service orders on 1 February 1977.

Probation is an alternative to imprisonment; it consists of the conditional suspension of punishment while the offender is placed under the personal supervision of a probation officer and is given guidance, counselling and assistance for his rehabilitation in the community. Parole is the conditional release of selected prisoners under the personal supervision of a parole officer after the offender has served part of his sentence in a penal institution. A Community Service Order is a non-custodial order of the court. It entails the offender consenting to spend some of his leisure time in projects which will benefit the community. In this way he repays to the community a debt incurred through his offending act.

One of the main functions of the Probation and Parole Service is to provide pre-sentence reports on convicted persons to the sentencing authorities. The purpose of the report is to assist the Court in coming to a decision as to sentence which is, as far as possible, in the best interests of the community and the offender. An aim of the Service has been to decentralise its activities. The first country office was opened in October 1973 at Albany. The following additional country offices have since been opened: Geraldton (1976); Kalgoorlie (1977); Bunbury (1978); Port Hedland (1978) and Broome (1979). In the metropolitan area there are District Offices at Fremantle, Bentley and Mirrabooka and a number of Reporting Centres at other localities.

The Act establishes a Parole Board of seven members comprising a Judge of the Supreme Court as Chairman, the Director of the Department of Corrections, and three men and two women appointed by the Governor. Female prisoners are dealt with by a Board comprising five of the Parole Board members.

The Act requires that where a person is sentenced to imprisonment for twelve months or longer the court shall, unless special circumstances make it inappropriate, fix a minimum term during which the convicted person is not eligible to be released. The court is given discretionary power to fix a minimum term where the sentence is for less than twelve months. Provision is made for remission of up to three days per month on the minimum term, as a reward for good conduct or industry. Where no minimum term has been fixed, remission of up to 26 per cent of the sentence may be allowed for diligence and good conduct.

The Parole Board is empowered to release on parole a prisoner who has served a minimum term fixed by a court, or a prisoner being detained at the Governor's pleasure.

The Governor may, on the recommendation of the Parole Board, direct the release on parole of a prisoner sentenced to imprisonment for life, a prisoner undergoing a sentence of imprisonment for life commuted from a sentence of death, or an unconvicted person held in custody during the Governor's pleasure following acquittal because of unsoundness of mind. The Parole Board is required to submit to the Minister, at prescribed intervals, a report and a recommendation concerning such prisoners.

Parole officers establish contact with prospective parolees during their imprisonment, prepare a case history of each prisoner for the information of the Parole Board, and supervise paroled persons during the parole period.

#### PROBATION AND PAROLE SERVICE

Particulars	Year ended 30 June —					
	1975	1976	1977	1978	1979	1980
PROBATION						
Number of persons —						
Under supervision at beginning of period	1,400	1,361	1,492	1,616	1,651	1,606
Admitted to probation during period	766	950	1,080	1,066	1,104	1,037
Under supervision during period	2,166	2,311	2,572	2,682	2,755	2,643
Cancellation of probation	67	137	227	225	306	314
Completion of probation	738	682	729	806	843	1,095
Under supervision at end of period	1,361	1,492	1,616	1,651	1,606	1,234
PAROLE						
Number of persons —						
Under supervision at beginning of period	560	589	551	522	497	510
Released on parole during period	486	399	397	355	321	330
Under supervision during period	1,046	988	948	877	818	840
Cancellation of parole	153	165	146	123	73	64
Completion of parole	304	272	280	257	235	296
Under supervision at end of period	589	551	522	497	510	480

## PUBLIC SAFETY

**National Safety Council**

The National Safety Council of Western Australia was founded in January 1946 following discussions among office bearers and senior officials of the Royal Automobile Club of Western Australia and police and education authorities about the creation of an organisation for the prevention of accidents.

Although the Council has been primarily concerned with road traffic safety and training courses associated with it, a Home Safety Division was established in 1963 and a Water Safety Division in 1965 and these also conduct a wide range of practical training courses. An Industrial Safety Division was also formed but now operates as a separate organisation although it is affiliated with the Council.

The National Safety Council of Western Australia is the State member division of the National Safety Council of Australia and is also represented on the Federal Publicity Advisory Committee on Education in Road Safety.

The Council aims at the prevention of accidents by the co-ordination of the efforts of relevant organisations and by an educational programme in accident prevention techniques. It pursues its objectives through the voluntary service of executive members, the financial support of the Government, and the staff and facilities of the Safety Instructional Centre at Mount Lawley. This Centre, situated on about seven and one-quarter hectares of land close to Perth, comprises a complete road system and a comprehensive office complex including a projection theatre and lecture rooms.

**Fire Protection**

**Western Australian Fire Brigades Board.** The *Fire Brigades Act 1942-1979* constitutes the Western Australian Fire Brigades Board of ten members. The Board comprises two members appointed by the Governor, one of whom is president of the Board; three members elected by the insurance companies carrying on business in the State; one member elected by the Council of the City of Perth; three members elected by other local government authorities; and one member elected by the registered volunteer fire brigades. The general duties of the Board are to take, superintend and enforce all necessary steps for the prevention and extinguishing of fires and the protection of life and property from fire, and the control of all fire brigade premises and of all fire brigades.

The number of fire calls received in the metropolitan fire district and other fire districts in each of the six-years 1974-75 to 1979-80 is given in the following table.

WESTERN AUSTRALIAN FIRE BRIGADES BOARD — CALLS RECEIVED

Year	Number of fire calls						Number of calls for special services	Total calls
	False alarms	Fires causing negligible damage	Other fires causing damage estimated at —					
			Less than \$250	\$250 (a) to \$10,000	\$10,001 to \$250,000	More than \$250,000		
			(a)	(b)	(b)	(b)		
METROPOLITAN FIRE DISTRICT (c)								
1974-75	2,112	2,912	119	405	23	3	454	6,028
1975-76	2,403	3,120	267	208	7	5	428	6,438
1976-77	2,567	2,607	589	463	45	3	403	6,677
1977-78	2,864	2,923	516	511	51	1	416	7,282
1978-79	3,257	3,252	554	713	77	3	432	8,288
1979-80	3,402	3,013	513	721	74	2	404	8,129
OTHER FIRE DISTRICTS								
1974-75	199	1,452	52	235	23	3	93	2,057
1975-76	226	1,371	120	112	11	1	103	1,944
1976-77	266	1,206	279	270	31	1	97	2,150
1977-78	274	1,140	176	235	30	—	97	1,952
1978-79	189	832	172	188	38	3	99	1,521
1979-80	185	693	165	231	41	3	79	1,397



WESTERN AUSTRALIAN FIRE BRIGADES BOARD — CALLS RECEIVED — *continued*

Year	Number of fire calls						Number of calls for special services	Total calls
	False alarms	Fires causing negligible damage	Other fires causing damage estimated at —					
			Less than \$250 (a)	\$250 (a) to \$10,000	\$10,001 to \$250,000 (b)	More than \$250,000 (b)		
WESTERN AUSTRALIA								
1974-75	2,311	4,364	171	640	46	6	547	8,085
1975-76	2,629	4,491	387	320	18	6	531	8,382
1976-77	2,833	3,813	868	733	76	4	500	8,827
1977-78	3,138	4,063	692	746	81	1	513	9,234
1978-79	3,446	4,084	726	901	115	6	531	9,809
1979-80	3,587	3,706	678	952	115	5	483	9,526

(a) \$200 prior to 1976-77.

(b) \$200,000 prior 1976-77.

(c) As defined in the Fire Brigades Act.

Fifteen permanent and two volunteer brigades operate in the metropolitan fire district centred on the City of Perth. Permanent brigade personnel serve with volunteer brigade personnel in five large country centres, and volunteer brigades provide town fire protection at eighty other centres. At 30 June 1980, the Board had 844 employees and there were 2,028 volunteer brigade officers and firemen.

**Bush Fires Board.** The Bush Fires Board, which is constituted under the *Bush Fires Act 1954-1979*, consists of sixteen members appointed by the Governor on the recommendation of the Minister. It comprises the Under Secretary for Lands as chairman; six persons nominated by the Country Shire Councils' Association of W.A.; and one person nominated by each of the following: the Minister for Forests, the Minister for Agriculture, The Western Australian Government Railways Commission, the Insurance Council of Australia, the Commissioner of Police, the Forest Products Association (W.A.), the State Regional Director of the Bureau of Meteorology, the Western Australian Wildlife Authority and the National Parks Authority of Western Australia. The principal functions of the Board are to administer the Bush Fires Act; to report to the Minister on methods of preventing or extinguishing bush fires; to recommend the prohibited and restricted burning times to be declared for the whole or any part of the State for any yearly period; to carry out such fire prevention measures as it considers necessary; to carry out research in connection with fire prevention and control; to conduct publicity campaigns for the purpose of improving fire prevention measures; and to provide training facilities for volunteers.

The Board operates through its staff of liaison officers based in country centres. These officers promote fire protection by the exercise of co-ordination, liaison and advisory functions.

Local authorities throughout the State handle local administration of the Bushfires Act.

## CHAPTER VI — FINANCE

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## CHAPTER VI — FINANCE

### Part 1 — Public Finance

#### COMMONWEALTH-STATE FINANCIAL RELATIONS

**Financial Agreement 1927.** Under the terms of the Financial Agreement, the Commonwealth Government took over from the States their public debts existing at 30 June 1927 and assumed responsibility for all future loan raisings by the Commonwealth and State Governments. The Commonwealth Government also agreed to contribute annually for a period of fifty-eight years from 1 July 1927 an amount of \$15,169,824 towards the interest payable on the States' debts, Western Australia's share of this amount being \$946,864.

Sinking Funds established by the Financial Agreement between the Commonwealth Government and the States were designed to redeem the States' debts as follows: (a) debt existing at 30 June 1927, in a period of fifty-eight years thereafter; (b) debt incurred after 30 June 1927 (except debt for the purpose of redemptions or conversions or the financing of revenue deficits), in a period of fifty-three years from the date of creation of the debt; (c) debt incurred to finance revenue deficits for the years 1929-30 to 1934-35, in a period of thirty-nine years from 30 June 1944; and (d) debt incurred to finance other revenue deficits, in a period of approximately seventeen years from the date of its creation.

These Sinking Funds are under the control of the National Debt Commission. Receipts of the Funds consist mainly of contributions from the Consolidated Revenue Funds of the Commonwealth and State Governments. The Commonwealth Government and the States make annual contributions towards the redemption of debt existing at 30 June 1927 and subsequent debt created over the period 1 July 1927 to 30 June 1975.

Contributions made by the Commonwealth Government and the States in respect of the States' debts are not accumulated but must be applied by the National Debt Commission, whenever expedient, to the redemption and repurchase of loan securities. Under the provisions of the Financial Agreement, repurchased or redeemed securities must be cancelled, and the debts of the States are reduced accordingly.

**Financial Agreement 1976.** The *Financial Agreement Act 1976* amended the Financial Agreement of 1927 by establishing a new scale of sinking fund contributions in respect of State debt. Under provisions of the Act, Western Australia provided an amount of \$15.3 million and the Commonwealth an amount of \$38.1 million in respect of the year 1979-80. The Act, which applied retrospectively to 30 June 1975 also provided for the transfer of \$1,000 million of State debts to the Commonwealth with effect from 30 June 1975. The amount of debt transferred under this amendment in respect of Western Australia was \$96.1 million.

**Australian Loan Council.** The Australian Loan Council was established by the Financial Agreement Act of 1928 to co-ordinate the public borrowings of the Commonwealth and State Governments. The Council has as its Chairman the Prime Minister of Australia, or a Minister nominated by him, and the other members are the Premiers of the States or, in the absence of a Premier, a Minister nominated by him. The Commonwealth and each State submits to the Council a programme of its desired loan raisings during each financial year, including the amount of any revenue deficit to be funded. The Commonwealth Government's borrowings for defence purposes are expressly excluded from its submissions to the Council. If the Council decides that the total amount of the loan programme for a year cannot be borrowed at reasonable

rates and conditions, it decides the amount to be borrowed during the year, and may by unanimous decision allocate this amount between the Commonwealth and the States. Where the members fail to arrive at a unanimous decision the Commonwealth is entitled to a maximum of one-fifth of the total sum to be borrowed. Of the balance, each State is entitled to an amount in the proportion which its net loan expenditure during the preceding five years bears to the aggregate for all the States.

For 1979-80 the Loan Council approved a borrowing programme for the States of \$1,245 million of which \$830 million comprised borrowings and \$415 million was provided as capital grants to the States. Western Australia's share amounted to \$1,17.2 million, comprising \$76.8 million for borrowings and \$38.4 million for capital grants.

At the June 1978 meeting of the Loan Council, new guidelines were approved for its consideration of special additions to the borrowing programmes of larger authorities for the purpose of financing infrastructure. The guidelines apply to Commonwealth and State public corporations and to local authorities. They do not apply to borrowings by the Commonwealth and State Governments.

Under the guidelines, each proposal for a special addition to the borrowing programme is examined according to certain criteria including economic feasibility; special significance to the economic development of Australia; importance and urgency; and the need for the loan. In special circumstances, borrowing overseas may be arranged. Approval by the Loan Council of special borrowings for financing infrastructure requires the agreement of a simple majority and the Commonwealth Government.

Actual borrowing under the guidelines for Australia amounted to \$400.7 million in 1979-80. In the year 1980-81 approvals for borrowing amounted to \$694.3 million of which Western Australia's share amounted to \$56.8 million including \$13.2 million for the North West Shelf gas infrastructure and \$12.2 million for the Muja D electricity project.

**Financial Assistance Grants.** Annual Financial Assistance Grants were made to every State from 1959-60 to 1975-76. In addition to the annual Financial Assistance Grants, special revenue assistance has been provided in some years and details of these and other payments are shown in the next table under the heading *General Purpose Grants*.

At a series of Premiers' Conferences held in February, April and June 1976 it was announced that the Financial Assistance Grants were to be replaced by arrangements under which each State would receive a share of Commonwealth personal income tax collections.

**Personal Income Tax Entitlements.** The *States (Personal Income Tax Sharing) Act 1976* which repealed the States Grants Acts of 1973, 1974 and 1975 operated with effect from the year commencing 1 July 1976 and for subsequent years. The Act provided for the States to share 33.6 per cent of personal income tax collected by the Commonwealth in each year. Each State's share was to be determined according to its estimated population at 31 December of the relevant financial year, after 'weighting' that population according to the financial ratios which applied between the States in 1975-76. It was further provided that the States' entitlements in any year would be not less than in the previous year. In addition, for a period of four years ending 30 June 1980, entitlements were not to be less in a year than the amount which would have been available in that year by the financial assistance grants authorised by the *States Grants Act 1973*. The Act also provided that the Commonwealth Government should consult with the State Governments before 30 June 1981 concerning the need for changes in the provisions of the Act.

The *States (Personal Income Tax Sharing) Amendment Act 1978* provided, subject to the guarantee arrangements contained in the principal Act that the States' entitlements would be \$4,336.1 million for 1977-78, and for subsequent years 39.87 per cent of the net personal income tax collections for the preceding year. In the year 1979-80 Western Australia's share amounted

to \$662.9 million. A further amendment provides for periodic reviews by a special division of the Commonwealth Grants Commission of the relativities between the States in their tax sharing entitlements. Further details are provided later in this Chapter under the heading *Commonwealth Grants Commission*.

From the Premiers' Conferences held in 1976 and 1977, a further understanding was reached that each State would be able to legislate to impose a surcharge on personal income tax, or grant a rebate on personal income tax. In either case the Commonwealth Government would act as an agent for the State. Enabling legislation was authorised in June 1978 by the *Income Tax (Arrangements with the States) Act 1978*.

At the Premiers' Conference in December 1979, it was agreed that the provisions of the *States (Personal Income Tax Sharing) Act 1976*, as amended, should continue for the year 1980-81. However, there was to be an additional guarantee that each State would receive no less in real terms than the amount it received in 1979-80 as measured by the Consumer Price Index for the four quarters to March 1981, compared with the four quarters to March 1980. This guarantee was authorised by the *States (Personal Income Tax Sharing) Amendment Act 1980*.

The *Local Government (Personal Income Tax Sharing) Act 1976* provided that from 1976-77 local government would receive 1.52 per cent of personal income tax collections in the previous year. Subsequent amendments to the Act in 1979 and 1980 increased this percentage to 1.75 and 2.0 respectively. The Act also provides that allocations should be made as prescribed and have regard to the recommendation of a Local Government Grants Commission which was to be constituted in each State not later than 30 June 1978. Legislation constituting the Western Australian Local Government Grants Commission became effective on 11 May 1978 under the authority of the *Local Government Grants Act 1978*. Western Australia's share for 1978-79 and 1979-80 amounted to \$16.8 million and \$20.8 million respectively. Further details are shown under the heading the *Local Government System* in Chapter III.

**Commonwealth Grants Commission.** Section 96 of the Commonwealth Constitution provides that the States may be granted financial assistance. In 1933 the Commonwealth Parliament passed the Commonwealth Grants Commission Act establishing a Commission to inquire into and report on applications made by States for grants of financial aid.

#### COMMONWEALTH GOVERNMENT PAYMENTS TO WESTERN AUSTRALIA (\$'000)

Item	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79
<b>GRANTS</b>						
General public services	601	659	1,379	1,857	1,939	1,364
Education —						
Government schools	7,933	19,984	22,108	22,998	31,389	37,248
Non-government schools	5,076	11,624	9,807	14,864	17,858	19,227
Technical education	2,285	2,755	6,198	7,296	7,514	8,886
Universities	19,191	35,692	37,985	50,616	54,127	53,503
Colleges of advanced education	24,469	39,640	43,866	51,316	53,278	55,423
Aboriginal education	1,237	2,381	2,004	2,154	2,245	2,155
Pre-schools and child care	645	4,608	6,456	5,744	6,444	6,597
Other	473	1,716	2,126	2,730	2,875	3,452
Total	61,309	118,400	130,550	157,718	175,730	186,491
Health —						
Medibank —						
Public hospital running costs	..	..	96,745	74,674	109,714	117,017
Public hospitals	695	4,326	11,900	12,000	4,680	—
Aboriginal health	4,056	6,060	7,368	5,593	6,135	6,334
School dental scheme	1,052	2,067	5,126	3,589	3,849	2,700
Community health	1,644	4,003	2,877	5,696	5,330	4,610
Other	1,360	1,665	1,257	1,576	1,029	1,093
Total	8,807	18,121	125,273	103,128	130,737	131,754

**COMMONWEALTH GOVERNMENT PAYMENTS TO WESTERN AUSTRALIA — *continued***  
**(\$'000)**

Item	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79
<b>GRANTS — <i>continued</i></b>						
Social security and welfare —						
Employment grants	882	3,400	2,000	—	—	—
Regional Employment Development Scheme	..	5,503	9,123	1	—	—
Assistance for deserted wives	1,171	1,152	1,459	1,700	1,848	3,841
Aboriginal welfare	2,061	3,124	1,820	1,023	630	647
Other	488	418	1,477	1,839	1,389	1,824
Total	4,602	13,597	15,879	4,563	3,867	6,312
Housing and community amenities —						
Aboriginal housing	4,000	—	2,882	3,938	3,700	4,120
Sewerage	..	3,890	3,875	2,928	76	—
Other	1,044	3,476	3,109	1,351	627	667
Total	5,044	7,366	9,866	8,217	4,403	4,787
Recreation and related cultural services	312	2,898	1,112	1,226	555	448
Economic services —						
Water resources investigations	1,300	1,667	1,981	2,000	2,000	3,053
Rural reconstruction	1,325	908	1,137	1,036	63	—
Roads	48,285	50,449	62,225	58,053	62,045	64,963
Urban public transport	..	2,829	750	1,869	605	2,015
Other	3,912	2,599	3,582	3,828	4,851	5,803
Total	54,822	58,452	69,675	66,786	69,564	75,834
Other purposes —						
General purpose grants —						
Capital assistance	25,806	32,179	40,099	42,117	44,220	44,226
Debt charges assistance	4,422	5,528	..	..	..	..
Financial assistance (a)	222,388	279,830	363,031	440,800	519,891	579,532
Interest on State debts	947	947	947	947	947	947
Local government (Grants Commission)	..	4,959	7,524	13,162	15,524	16,848
Sinking fund on State debt	2,855	2,976	2,800	2,981	3,175	3,377
Special revenue assistance	2,855	7,073	—	—	—	—
Natural disaster relief	—	—	4,280	1,701	2,784	1,524
Total	259,273	333,492	418,681	501,708	586,541	646,454
GRAND TOTAL	394,770	552,985	772,415	845,203	973,336	1,053,442
Current	283,575	408,744	603,775	687,806	815,505	891,860
Capital	111,195	144,241	168,640	157,397	157,831	161,582
<b>ADVANCES</b>						
Gross advances —						
Defence (housing for servicemen)	191	784	698	1,230	2	—
Housing and community amenities —						
Housing assistance	13,000	37,440	33,440	35,440	36,740	29,767
Land acquisition and development in urban areas	..	9,833	6,121	3,882	5,026	2,537
Sewerage in principal urban areas	3,800	11,715	8,680	6,300	—	—
Economic services	6,815	4,719	6,691	4,839	4,294	9,377
Other purposes —						
State works programmes (b)	54,587	68,068	80,197	84,235	88,446	88,446
Natural disaster relief	—	—	67	2,001	15,714	6,895
Total, Gross advances	78,393	132,559	135,894	137,927	150,222	137,021
Net advances (c) —						
Defence (housing for servicemen)	153	744	655	1,185	—46	—50
Housing and community amenities —						
Housing assistance	12,998	37,438	33,438	33,263	34,297	27,031
Land acquisition and development in urban areas	..	9,833	6,121	3,882	5,026	2,537
Sewerage in principal urban areas	3,800	11,709	8,666	6,243	—80	—92
Other	—1,558	—1,678	—1,945	—14	—12	—14
Economic services	4,725	2,521	4,019	1,566	616	6,232
Other purposes —						
State works programmes (b)	40,022	52,732	65,366	68,473	71,607	70,275
Natural disaster relief	—	—	67	2,001	15,714	6,639
Total, Net advances	60,140	113,299	116,387	116,599	127,122	112,557

(a) Including payments in place of Special Grants.  
 repayments.

(b) Australian Loan Council borrowing.

(c) Gross advances less

In each year from 1934-35, in respect of which the Commission made its first recommendation, Western Australia received a Special Grant until it ceased to be a claimant State from and including the year 1968-69, in accordance with an agreement made between the Commonwealth and the State at a Premiers' Conference in June 1968.

The *Commonwealth Grants Commission Act* 1973, which repealed the *Commonwealth Grants Commission Act* 1933 and later amendments, continued the principle of making special assistance available to a State for its own purposes and, in addition, authorised the provision of assistance to a State for local government purposes. Grants to Western Australia, for distribution among local government authorities as recommended by the Grants Commission, amounted to \$4.96 million for the year 1974-75 and \$7.52 million for 1975-76.

From 1976-77, new arrangements operated with the passing of the *Commonwealth Grants Commission Act* 1976 and the *Local Government (Personal Income Tax Sharing) Act* 1976. Reference has been made in the preceding section to an amendment contained in the *States (Personal Income Tax Sharing) Amendment Act* 1978 which provides for periodic reviews by a special division of the Commonwealth Grants Commission of the relativities between the States in their tax sharing entitlements. In conjunction with this Act, the *Commonwealth Grants Commission Amendment Act* 1978 provided for the constitution of a division of the Commission comprising the Chairman and two members of the Commission, in addition to three associate members, one of whom would be nominated by the governments of New South Wales and Victoria and two by the governments of the four remaining States. The factors to be taken into consideration in the conduct of inquiries by the special division of the Commonwealth Grants Commission and the method of its operation are as prescribed by the two Acts mentioned.

**Other Financial Assistance.** As well as providing general financial assistance to the States by means of grants, the Commonwealth Government allocates to them funds for specific purposes, as shown in the preceding table which gives details of payments made to Western Australia during the six-year period ended 30 June 1979. Grants in the financial year 1978-79 totalled \$1,053,442,000 while net advances for the same period amounted to \$112,557,000. Social service benefits and national health benefits are paid from the National Welfare Fund. In addition, financial assistance for housing and war service land settlement is provided from the Loan Fund.

### Cash Benefits to or for Persons

The following table gives details of all cash benefits paid during the six-year period ended 30 June 1979. Cash benefits to or for persons in Western Australia increased from \$234,460,000 to \$715,620,000 over the period. Social security and welfare amounted to \$600,991,000 in 1978-79 or 84.0 per cent of the total cash benefits, followed by Health with \$85,859,000 or 12.0 per cent.

COMMONWEALTH GOVERNMENT CASH BENEFITS TO OR FOR PERSONS IN  
WESTERN AUSTRALIA (a)  
(\$'000)

Item	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79
Education —						
Primary and secondary education	2,723	2,967	2,728	2,770	3,833	3,812
University education	4,296					
Other higher education	1,076	9,509	13,315	16,228	17,501	18,217
Other education programmes	1,684	1,876	2,563	3,021	3,907	4,593
Total	9,779	14,352	18,606	22,019	25,241	26,622

COMMONWEALTH GOVERNMENT CASH BENEFITS TO OR FOR PERSONS IN  
WESTERN AUSTRALIA (a) — *continued*  
(\$'000)

Item	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79
<b>Health —</b>						
Hospital and clinical services —						
Hospital benefits for pensioners	2,332	2,276	606	..	..	..
Hospital benefits reinsurance	—	—	—	—	1,288	—2,100
Hospital benefits n.e.c.	7,451	8,818	6,257	1,225	r 19	9
Medibank —						
Private hospital daily bed payments	..	..	5,175	5,993	5,883	5,940
Nursing home benefits	11,440	14,665	18,772	22,228	24,384	26,390
Other	50	85	94	92	141	102
Other health services —						
Medibank —						
Medical benefits	..	..	42,067	35,702	21,168	36,301
Medical benefits for pensioners	2,495	3,539	372	..	..	..
Medical benefits n.e.c.	13,983	15,898	5,737	74	19	—
Pharmaceutical benefits for pensioners	4,429	5,310	7,104	7,609	8,469	9,917
Pharmaceutical benefits n.e.c.	7,318	8,834	9,999	8,185	8,854	8,370
Other	550	762	847	912	877	930
<b>Total</b>	<b>50,048</b>	<b>60,187</b>	<b>97,030</b>	<b>82,020</b>	<b>71,102</b>	<b>85,859</b>
<b>Social security and welfare —</b>						
Assistance to aged persons —						
Age pensions	83,580	118,492	156,447	183,519	216,111	238,241
Other	1,039	1,537	2,020	2,456	2,489	2,735
Assistance to incapacitated and handicapped persons —						
Invalid pensions	14,431	20,320	27,066	33,666	39,321	46,592
Other	964	1,791	2,437	3,531	4,417	4,886
Assistance to unemployed and sick persons —						
Unemployment benefits	5,020	19,753	33,824	42,958	59,324	82,842
Sickness benefits	2,805	4,415	6,190	6,814	7,585	7,200
Other	489	1,028	1,329	1,373	2,118	2,905
Assistance to ex-servicemen —						
War and service pensions and allowances	27,554	36,996	43,677	52,519	62,501	67,067
Other benefits	331	345	297	263	280	209
Assistance to widowed and deserted spouses —						
Widows' pensions	13,409	18,459	24,809	27,700	32,290	36,329
Assistance to families and children —						
Family allowance (b)	19,009	19,084	22,737	89,514	90,809	88,151
Supporting parents' benefits	4,729	8,102	12,547	15,588	18,602	22,996
Other	646	735	733	738	743	450
Other social security and welfare programmes	187	228	313	321	342	388
<b>Total</b>	<b>174,193</b>	<b>251,285</b>	<b>334,426</b>	<b>460,960</b>	<b>536,932</b>	<b>600,991</b>
<b>Economic services —</b>						
General administration, regulation and research —						
National Employment and Training Scheme	..	1,068	3,384	1,514	1,748	2,032
Other	440	552	1,421	728	471	116
<b>Total</b>	<b>440</b>	<b>1,620</b>	<b>4,805</b>	<b>2,242</b>	<b>2,219</b>	<b>2,148</b>
<b>Other purposes —</b>						
Natural disaster relief	—	405	33	—	—	—
<b>TOTAL. ALL CASH BENEFITS</b>	<b>234,460</b>	<b>327,850</b>	<b>454,900</b>	<b>567,241</b>	<b>635,494</b>	<b>715,620</b>

(a) For conditions and rates applying to payment of social service benefits, health benefits, and other forms of assistance, see Chapter V. Because of the administrative arrangements made for the payment of certain benefits it has not been practicable to allocate amounts for those benefits precisely between States. In such cases, estimates have been made. (b) Prior to 15 June 1976 known as child endowment.

The main components of cash benefits are hospital, medical, pharmaceutical, sickness and unemployment benefits, family allowance, and widows', age, invalid and repatriation pensions. These are paid from the National Welfare Fund which was established in 1943 by the National Welfare Fund Act. Further reference to the Fund will be found at the beginning of Chapter V, Part 4. Other cash benefits include scholarships and payments to trainee teachers.



## STATE GOVERNMENT FINANCE

The tables in the following pages relate to the financial activities of the Government of Western Australia, statutory authorities, boards, commissions and corporations, and incorporated bodies in which the State Government or its agencies have a controlling interest (other than financial enterprises).

The revised series is designed to provide, for the public sector, statistics which complement the accounts for individual sectors provided in the Australian National Accounts. These statistics are intended to consolidate the transactions of the various public authorities and present them so that their economic impact may be assessed; to show the purposes that are being served by government expenditures; and to show the roles of the various levels of government in the undertaking and financing of these expenditures.

Basic principles which have been followed in developing the data for the economic accounts for the public sector are that all public authorities should be included; all funds under the control of those authorities should be analysed; and transfers between funds, accounts and authorities should be eliminated to present tables on a consolidated basis.

In this section of the Year Book the public sector has been taken to comprise general government bodies (excluding local government authorities) and public trading enterprises. Public financial enterprises have been omitted from the consolidated accounts presented here, largely on the ground that combining the income and outlay and capital financing transactions of publicly-owned trading and savings banks, government insurance offices and other public financial institutions with the equivalent transactions of public trading enterprises and general government seems to provide a less meaningful account of public sector activity.

*General government bodies* are all of the agencies of government not classified as public enterprises, i.e. all government departments, offices and other bodies engaged in providing services free of charge or at prices significantly below their cost of production.

*Public trading enterprises* are government undertakings which aim at covering the bulk of their expenses by revenue from sales of goods and services.

Details of the State Authorities whose accounts have been analysed for the purposes of the statistics presented here may be found in the publication *Finance* (Catalogue No. 5101.5), issued by this Office.

The classifications used in the tables are, generally, in accordance with those adopted in the publication *A System of National Accounts*, United Nations, New York, 1968 which is a widely accepted international standard for the classification of government financial transactions. Two of the main classifications used in that publication are classifications by economic type and by purpose.

The economic type classification, in broad terms, is designed to categorise transactions between public authorities and the private sector, and between public authorities where sub-sectors of the public sector have been identified, in a way which facilitates a study of the impact of government transactions on the economy.

The purpose classification scheme is the medium by which outlays with similar objectives are brought together to reveal more fully the broad purposes of public sector spending, and to provide a framework for developing means of assessment of the effectiveness of outlays in achieving government policies. With the classification of outlays by economic type, the purpose classification also facilitates the assessment of the economic impact of identified programmes of expenditure.

Figures for some items published in the public authority finance series may differ from issue to issue as a consequence of reclassification of items and other improvements made in the course of developing the most appropriate presentation of the financial transactions of public authorities.

For further information on the methods and principles used in compiling data for Western Australia, reference may be made to the publication *Finance* (Catalogue No. 5101.5), issued by this Office.

In the accompanying table, it will be seen that the main components of the receipts of Western Australian State Authorities are taxation, grants from the Commonwealth Government, and borrowing and financing transactions. Further details of taxation collections by State Authorities and local government authorities are given later in this Part.

STATE AUTHORITIES: RECEIPTS ACCORDING TO SOURCE  
(\$'000)

Item	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79
Taxes, fees, fines	155,010	203,670	260,135	300,183	342,980	375,662
Income from public enterprises	24,146	25,163	49,257	25,021	22,896	27,358
Income from property —						
Interest	18,682	20,735	15,899	21,224	34,264	31,007
Land rent	5,547	4,859	4,523	5,675	6,214	8,576
Royalties	37,362	43,604	48,271	57,347	60,760	64,737
Dividends	2	2	2	2	—	—
Total, Income from property	61,593	69,200	68,695	84,248	101,238	104,320
Grants from the Commonwealth Government —						
For current purposes	282,874	403,192	595,416	684,268	815,321	890,664
For capital purposes	115,125	143,831	167,788	159,390	157,487	160,849
Total, Grants	397,999	547,023	763,204	843,658	972,808	1,051,513
Financing items —						
Net borrowing —						
Public corporation securities	25,346	27,423	36,278	41,296	60,278	70,074
Other general government securities	2,278	3,164	4,764	5,611	6,257	18,701
Advances from the Commonwealth Government (net) —						
For loan works purposes	40,022	52,732	65,366	68,473	71,607	70,275
Other	20,118	60,567	51,020	48,136	55,664	42,282
Net receipts of private trust funds	11,751	10,983	18,745	25,873	26,704	18,446
Reduction in cash and bank balances	—14,614	26,792	—115,304	—34,041	—12,933	12,744
Reduction in security holdings	—8,499	4,195	—12,533	—18,395	—32,615	—23,525
Other funds available —						
Depreciation allowances	28,011	27,293	30,080	32,661	42,067	45,881
Other	8,936	4,588	49,387	65,772	36,357	56,197
Total, Financing items	113,349	217,737	127,803	235,386	253,386	311,075
TOTAL FUNDS AVAILABLE	752,097	1,062,793	1,269,094	1,488,496	1,693,308	1,869,928

The next table shows the outlay by Western Australian State Authorities classified by economic type of transaction. The principal categories of the classification are Final consumption expenditure, Gross capital formation, Transfer payments, and Financing items. (Details of Financing items appear under this heading in the preceding table and under *Net advances* in the following table.) Over the six-years 1973-74 to 1978-79, the total outlay by State Authorities increased from \$752,097,000 to \$1,869,928,000, Final consumption expenditure amounting to \$1,057,547,000 in 1978-79.

*Final consumption expenditure* refers to expenditure by public authorities (other than those classified as public enterprises) which does not result in the creation of fixed tangible assets or in the acquisition of land, buildings or secondhand goods. It comprises expenditure on wages, salaries and supplements, and on goods and services other than fixed assets and stock. Fees, etc. charged by general government bodies for goods sold and services rendered are offset against purchases. Net expenditure overseas by general government bodies and purchases from public enterprises are included. All expenditure on defence is classified as Final consumption expenditure.

STATE AUTHORITIES: OUTLAY ACCORDING TO ECONOMIC TYPE  
(\$'000)

Item	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79
Final consumption expenditure —						
General public services —						
General administration n.e.c.	24.170	32.195	35.618	37.894	50.195	58.011
Law, order and public safety	38.243	56.042	69.698	84.217	96.907	109.202
Education	158.710	233.890	299.230	362.026	406.007	448.179
Health	95.137	143.255	215.357	263.656	297.835	322.242
Social security and welfare	7.548	11.437	12.714	14.769	14.924	17.265
Housing and community amenities	847	1.869	3.538	2.988	3.379	2.614
Recreation and related cultural services	4.689	6.889	8.737	11.249	13.242	20.591
Economic services —						
General administration, regulation and research	5.504	8.040	9.497	10.257	12.607	12.439
Agriculture, forestry and fishing —						
Soil, water and forest resources management	1.419	957	2.510	1.245	68	147
Services to agricultural and pastoral industries and to fisheries	12.717	17.888	21.038	23.623	29.389	31.377
Mining, manufacturing and construction	7.540	8.858	10.349	10.911	12.894	12.605
Electricity, gas and water supply services	1.122	2.804	4.219	4.737	4.616	5.694
Transport and communication	1.757	2.415	2.307	2.617	2.108	2.374
Other economic services	4.666	6.889	6.806	7.874	13.402	14.017
Other purposes	87	181	306	255	794	790
Total	364.156	533.609	701.924	838.318	958.367	1,057.547
Gross capital formation —						
Increase in stocks	2.758	12.640	6.304	1.676	321	6,434
Expenditure on new fixed assets —						
General public services —						
General administration n.e.c.	4.357	3.844	7.428	7.099	7.308	7.615
Law, order and public safety	3.041	5.906	5.606	8.023	13.313	16.661
Education	31.918	52.345	53.477	51.082	63.103	62.927
Health	20.238	30.983	44.229	45.911	45.172	54.224
Social security and welfare	2.178	2.107	1.738	1.821	1.094	1.011
Housing and community amenities —						
Housing	16.057	14.430	17.890	41.590	54.340	38.779
Community and regional development	1.179	1.593	1.483	1.088	3.369	1.236
Protection of the environment	22.228	34.854	36.727	40.624	41.505	39.504
Recreation and related cultural services	305	1.274	1.937	2.581	5.318	5.388
Economic services —						
General administration, regulation and research	—	—	—	12	4	54
Agriculture, forestry and fishing —						
Soil and water resources management	3.201	1.610	1.616	1.924	1.133	7.741
Forest resources management	6.034	8.303	9.454	14.076	17.018	19.790
Services to agricultural and pastoral industries and to fisheries	1.547	2.199	1.618	1.960	2.372	3.506
Mining, manufacturing and construction	2.844	1.170	294	3.745	2.318	3.263
Electricity, gas and water supply services —						
Electricity and gas	38.362	50.676	46.649	65.232	84.118	111.328
Water	24.551	27.208	34.453	40.166	43.363	44.754
Transport and communication —						
Rail transport	11.429	16.248	23.261	22.688	15.279	19.226
Sea transport	9.240	13.286	19.513	10.304	12.861	16.776
Road transport	52.656	55.092	61.792	74.758	79.343	94.140
Urban transit	1.317	3.222	2.039	4.452	4.441	2.258
Other economic services	1.296	2.238	4.317	2.047	735	1.532
Other purposes	—	—	—	—	1.110	2.000
Total expenditure on new fixed assets	253.978	328.588	375.521	441.183	498.617	553.713
Expenditure on existing assets (net)	5.081	18.956	4.238	1.142	—2.644	—1.942
Total gross capital formation	261.817	360.184	386.063	444.001	496.294	558.205
Transfer payments —						
Interest	86.082	91.189	106.139	125.103	146.058	160.534
Transfers to persons	16.317	18.190	18.536	20.722	26.493	25.285
Subsidies	1.450	3.812	3.094	3.001	3.708	4.232
Grants for private capital purposes	1.303	3.192	3.352	2.265	3.320	3.323
Grants to local government authorities	15.192	29.680	33.729	40.887	42.454	47.551
Total	120.344	146.063	164.850	191.978	222.033	240.925

STATE AUTHORITIES: OUTLAY ACCORDING TO ECONOMIC TYPE — *continued*  
(\$'000)

Item	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79
Net advances —						
To the private sector	8.185	24.734	17.825	17.357	18.829	15.483
To public financial enterprises	—323	—17	11	—158	—65	—16
To local government authorities	—2.082	—1.780	—1.579	—3.000	—2.150	—2.216
Total	5.780	22.937	16.257	14.199	16.614	13.251
GRAND TOTAL	752.097	1,062.793	1,269.094	1,488.496	1,693.308	1,869.928
Current	484.500	679.672	866.774	1,030.296	1,180.400	1,298.472
Capital	267.597	383.121	402.320	458.200	512.908	571.456

*Gross capital formation* refers to expenditure on new fixed assets whether for additions or replacements, including wages and salaries paid in connection with capital works. Expenditure on new fixed assets for defence purposes is excluded. Expenditure on houses and flats is estimated by deducting the cost of previously-rented dwellings sold to the private sector from the estimated expenditure on construction of dwellings for rental. (The sales value of these previously-rented dwellings is included in private capital expenditure.) Because it has not been possible to make a satisfactory dissection, all expenditure on roads, including maintenance, is classified as capital.

*Transfer payments* include such items as interest payments on public loans, cash benefits to persons (i.e. current transfers to persons from general government in return for which no services are rendered or goods supplied), subsidies paid by public authorities to enterprises, grants to meet part of the cost of private capital expenditure, and grants to local government authorities.

*Financing items* relate to changes in financial assets and liabilities, and include transactions in securities of all types, borrowing and lending (including repayable advances made by public authorities to other public authorities), trade credit of public trading enterprises, and changes in cash balances.

### Public Debt

Under the Financial Agreement of 1927 (as amended) all debt of the Commonwealth and State Governments, with certain minor exceptions, is represented by Commonwealth Government Securities. The information in the following table is derived from the Budget Paper *Government Securities on Issue* published by the Commonwealth Government. The figures do not include government debt not evidenced by the issue of securities, or the debt of other bodies guaranteed by Government.

#### SECURITIES ISSUED ON BEHALF OF STATE GOVERNMENT

		At 30 June —					
Item		1974	1975	1976	1977	1978	1979
Securities on issue	\$'000	1,070,881	1,121,640	1,090,469	1,160,818	1,237,336	1,307,306
Per head of population	\$	978	999	952	970	1,010	1,051
Annual interest liability (Australian currency equivalent)	\$'000	62.201	71,463	77,869	87,406	97,817	104,910
Per head of population	\$	57	64	68	73	80	84

In the table Public Corporations: Debt, *debt* refers to liabilities with an original maturity of twelve months or more incurred in respect of loans and advances received (other than by way of bank overdraft), less repayments and redemptions. Current liabilities, such as interest accrued, trade creditors and amounts held in trust are excluded. The figures relate to the debt of those public corporations having power to borrow funds other than from Government.

**PUBLIC CORPORATIONS: DEBT**  
(\$'000)

Item	At 30 June —					
	1974	1975	1976	1977	1978	1979
Advances from public authorities	561.974	619.606	687.352	760.247	831.712	878.022
Loans	326.226	360.425	399.731	423.386	485.721	558.401
Other indebtedness	8.604	7.753	6.565	9.785	17.576	30.786
Debt outstanding	896.805	987.784	1.093.648	1.193.418	1.335.009	1.467.209

The principal governmental bodies whose debt is included in the above table are those concerned with energy supply, harbour services, housing, metropolitan region planning, transport, water supply and sewerage services.

Figures in both tables are on a gross borrowing basis as they include all transactions associated with borrowing by one level of government on behalf of another, and borrowing between levels of government and between public authorities.

**LOCAL GOVERNMENT FINANCE**

The financial powers of local government authorities in Western Australia are derived principally from the *Local Government Act 1960-1980*, the main provisions of which are outlined in Chapter III — *Constitution and Government*.

**Receipts and Payments**

The following table summarises the receipts and payments (including loan transactions) of local government authorities for the years 1974-75 to 1978-79. Amounts have been shown on a gross basis wherever practicable.

**SUMMARY OF LOCAL GOVERNMENT RECEIPTS AND PAYMENTS**  
(\$'000)

Item	1974-75	1975-76	1976-77	1977-78	1978-79
<b>Receipts —</b>					
Rates	49,554	62,439	69,961	79,813	89,765
Fees and fines	2,236	2,232	2,680	3,132	3,280
Government grants	30,656	38,174	22,755	31,149	36,283
Personal income tax entitlement	..	..	13,162	15,524	16,848
Loans raised (a)	21,911	28,106	32,629	35,052	37,139
<b>Reimbursements —</b>					
Road systems (b)	14,315	16,075	16,514	10,282	11,076
Other (c)	3,130	5,305	6,614	5,545	5,197
Other income	26,312	32,481	41,498	56,002	61,206
<b>Total. Receipts</b>	<b>148,116</b>	<b>184,813</b>	<b>205,813</b>	<b>236,499</b>	<b>260,794</b>
<b>Payments —</b>					
General public services	24,913	28,520	32,021	37,226	42,173
Education	1,091	755	540	448	567
Health	2,959	3,902	4,645	4,454	5,443
Welfare	984	1,794	1,813	3,042	2,511
Housing and community amenities	14,479	20,484	28,149	37,840	33,139
Recreation and related cultural services	27,099	35,477	36,640	41,506	51,761
<b>Economic services —</b>					
Road systems	52,005	60,460	66,019	72,547	84,333
Other	4,768	6,013	6,969	6,091	6,157
<b>Other purposes —</b>					
Debt redemption	9,176	9,764	11,079	12,808	14,506
<b>Interest —</b>					
On loans	7,791	9,714	11,999	14,883	18,410
On overdraft	273	539	560		
Loans raised on behalf of State Government (d)	2,376	2,583	3,537	1,960	3,989
<b>Total. Payments</b>	<b>147,916</b>	<b>180,005</b>	<b>203,971</b>	<b>232,806</b>	<b>262,988</b>
<b>Comprising: Recurrent payments</b>	<b>57,897</b>	<b>68,539</b>	<b>81,470</b>	<b>102,480</b>	<b>133,110</b>
<b>Capital payments</b>	<b>90,019</b>	<b>111,466</b>	<b>122,501</b>	<b>130,326</b>	<b>129,878</b>

(a) Includes loans raised on behalf of State Government authorities; see footnote (d). (b) Mainly reimbursements from the Main Roads Department for work performed on its behalf and from private developers for sub-divisional roads. (c) Includes debt charges in respect of loans raised on behalf of State Government authorities; see footnote (d). (d) In order to facilitate or expedite the performance of certain public works (e.g., water supply and sewerage services) it is sometimes expedient for local government authorities to raise loans on behalf of State Government authorities for such purposes.

Further details relating to local government finance in Western Australia are contained in the publication *Local Government* (Catalogue No. 1303.5), issued by this Office. A summary of statistics for other States may be found in the publication *Public Authority Finance — State and Local Authorities* (Catalogue No. 5504.0), issued by the Australian Statistician, Canberra.

### Loan Transactions

Under the provisions of the local government legislation, local government authorities are constituted as corporate bodies and are authorised to raise loans for works and undertakings and for the liquidation of existing loan debts. The conditions imposed by the *Local Government Act 1960-1980* in relation to loan raisings, the levying of loan rates, the expenditure of loan moneys and the repayment of loans are summarised in the section *The Local Government System* in Chapter III under the heading *Financial Provisions*.

Loans are raised mainly from banks, insurance companies and superannuation funds. The State Government exercises a measure of supervision over the loan transactions of local government authorities and, where a loan is repayable in full at maturity, maintains the necessary sinking fund at the Treasury.

Loan receipts and payments of local government authorities in the financial years 1974-75 to 1978-79 are included in the table above.

The following table shows the aggregate debt outstanding at 30 June of each year during the period from 1974 to 1979 in respect of all local authorities constituted under the Local Government Act. Figures are on a gross borrowing basis as they include all transactions associated with borrowing by one level of government on behalf of another, and borrowing between levels of government.

LOCAL AUTHORITIES: DEBT  
(\$'000)

Item	At 30 June —					
	1974	1975	1976	1977	1978	1979
Advances from public authorities	865	945	1,022	722	665	628
Loans	114,828	127,553	145,580	166,034	188,550	213,399
Other indebtedness	365	266	223	42	8	43
Debt outstanding	116,061	128,764	146,825	166,798	189,223	214,070

### TAXATION

#### Commonwealth Government Taxation

The taxes levied in Western Australia by the Commonwealth Government are listed in the table *Commonwealth Government Taxation, Net Collections in Western Australia* which appears later in this Part.

**Income Tax.** Income tax is by far the most important source of Commonwealth revenue from taxation and accounted for 70.5 per cent of all Commonwealth taxation collections in 1978-79. The tax is levied on the income of individuals, companies, partnerships and trusts, and certain private superannuation funds.

*Taxable income* is the amount remaining after deducting from assessable income all allowable deductions.

**INCOME TAX ASSESSMENTS — INDIVIDUALS (a): WESTERN AUSTRALIA**  
**INCOME YEAR 1977-78 (ASSESSMENT YEAR 1978-79)**

Grade of net income	Number of taxpayers			Taxable income		Net tax	
	Males	Females	Persons	Total	Average per taxpayer	Total	Average per taxpayer
\$				\$'000	\$	\$'000	\$
Under 4,000	21,082	20,035	41,117	140,945	3,428	5,418	132
4,000 — 4,999	20,013	25,585	45,598	204,488	4,485	15,495	340
5,000 — 5,999	20,922	22,919	43,841	240,802	5,493	26,721	609
6,000 — 6,999	21,861	20,790	42,651	277,156	6,498	38,024	892
7,000 — 7,499	12,723	9,921	22,644	164,302	7,256	25,417	1,122
7,500 — 7,999	14,578	12,166	26,744	207,277	7,750	34,297	1,282
8,000 — 8,499	15,534	10,870	26,404	217,782	8,248	37,898	1,435
8,500 — 8,999	16,888	8,798	25,686	224,644	8,746	40,691	1,584
9,000 — 9,499	16,998	6,616	23,614	218,328	9,246	40,952	1,734
9,500 — 9,999	16,771	5,336	22,107	215,494	9,748	41,615	1,882
10,000 — 10,499	16,028	4,402	20,430	209,252	10,242	41,681	2,040
10,500 — 10,999	14,636	3,530	18,166	195,188	10,745	39,798	2,191
11,000 — 11,499	12,935	3,194	16,129	181,369	11,245	37,919	2,351
11,500 — 11,999	11,719	2,644	14,363	168,696	11,745	35,946	2,503
12,000 — 12,499	10,783	2,070	12,853	157,349	12,242	34,125	2,655
12,500 — 12,999	9,436	1,769	11,205	142,798	12,744	31,543	2,815
13,000 — 13,999	15,896	3,142	19,038	256,560	13,476	58,896	3,094
14,000 — 14,999	12,573	1,996	14,569	210,944	14,479	50,337	3,455
15,000 — 15,999	10,034	1,617	11,651	180,316	15,476	44,641	3,832
16,000 — 16,999	7,752	1,083	8,835	145,577	16,477	37,417	4,235
17,000 — 17,999	6,001	685	6,686	116,839	17,475	31,184	4,664
18,000 — 18,999	4,581	568	5,149	95,138	18,477	26,174	5,083
19,000 — 19,999	3,399	432	3,831	74,610	19,475	21,348	5,572
20,000 — 23,999	7,350	919	8,269	179,019	21,649	55,255	6,682
24,000 — 31,999	4,034	628	4,662	126,095	27,047	44,433	9,531
32,000 — 39,999	1,151	205	1,356	47,835	35,277	19,281	14,219
40,000 — 49,999	521	95	616	27,385	44,456	12,299	19,966
50,000 and over	576	60	636	47,478	74,651	24,832	39,044
<b>Total</b>	<b>326,775</b>	<b>172,075</b>	<b>498,850</b>	<b>4,673,662</b>	<b>9,369</b>	<b>953,634</b>	<b>1,912</b>

(a) With certain exceptions, an individual was liable to pay tax on income derived in 1977-78 only if the taxable income exceeded \$3,402.

**COMMONWEALTH GOVERNMENT TAXATION (a)**  
**NET COLLECTIONS IN WESTERN AUSTRALIA**  
**(\$'000)**

Tax, duty, charge or levy	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79
<b>Income taxes —</b>						
Individuals (b)	385,515	589,873	711,869	866,736	972,994	986,432
Companies (c)	88,321	109,285	135,467	144,652	149,692	132,775
Dividend (withholding tax) (d)	755	1,029	1,158	1,119	3,178	1,241
Interest (withholding tax) (d)	1,430	1,282	1,796	1,622		1,960
<b>Total income taxes</b>	<b>476,021</b>	<b>701,469</b>	<b>850,290</b>	<b>1,014,129</b>	<b>1,125,864</b>	<b>1,122,408</b>
Estate duty	4,616	3,737	6,169	5,287	6,503	5,056
Gift duty	816	963	1,294	1,314	654	86
Customs duties (b)	30,045	42,867	46,162	61,942	67,890	71,429
Excise duties	132,108	147,137	186,073	198,758	214,128	254,243
Sales tax (b)	61,469	67,014	86,437	108,314	118,418	108,852
Primary production taxes	7,299	16,864	21,111	23,006	21,413	24,228
Broadcast listeners' and television viewers' licences	5,393	1,369	..	..	..	..
Stevedoring industry charge	2,352	2,684	5,807	7,646	4,813	2,682
Pay-roll tax (e)	50	22	6	7	20	1
Departure tax	..	..	..	..	..	886
Oil pollution levy	135	207	182	159	142	155
Other taxes, fees, fines, etc.	622	936	1,045	1,584	2,180	2,347
<b>Total taxation</b>	<b>720,926</b>	<b>985,269</b>	<b>1,204,576</b>	<b>1,422,146</b>	<b>1,562,025</b>	<b>1,592,373</b>

(a) Details of the purposes and rates applicable to the main forms of Commonwealth Government taxation are given in *Official Year Book of Australia*.

(b) The amounts shown have been adjusted by offsetting remissions under special circumstances of income tax, customs duties and sales tax. The amount also includes Medibank levy payable from 1 October 1976 to 1 November 1978.

(c) Includes payments in the nature of income tax from public enterprises.

(d) Tax levied in respect of dividends and interest deemed paid or payable to persons not residing in Australia.

(e) Discontinued as Commonwealth Government tax September 1971; from that date collected by State Government (see *State and Local Authorities Taxation* below).

It is important to note that, although the figures shown in the preceding table represent the amounts of taxes actually collected in Western Australia, they do not necessarily indicate the amounts contributed by the people of the State, as moneys may be collected in one State in respect of goods consumed or assessments made in other States. Further, administrative arrangements for the collection of certain taxes are such that a large proportion of the revenue (or, as in the case of wheat tax, the whole of the revenue) is brought to account in a State other than Western Australia.

#### State and Local Authorities Taxation

The net amounts collected in Western Australia in the form of State and local authorities taxation in each year from 1973-74 to 1978-79 are shown in the table at the end of this section. Information concerning rates of tax and the relevant legislation is given below.

**ESTATE DUTY (PROBATE AND SUCCESSION DUTIES).** Following amendments to the *Death Duty Act 1973-1978* and the *Death Duty Assessment Act 1973-1978* no death duty is payable on the estate of a person whose death occurred on or after 1 January 1980.

**LAND TAX.** The *Land Tax Assessment Act 1976-1980* authorises a tax, with certain specified exemptions, on every owner of land, and the rates of tax are prescribed by the *Land Tax Act 1976*; see table below.

LAND TAX — RATES OF TAX AND AMOUNTS  
PAYABLE: ASSESSMENT YEAR 1979-80

Unimproved values —		Rate	
Exceeding	Not exceeding	Tax on amount in first column	Tax per dollar on remainder
\$	\$	\$	cents
Nil	5,000	—	0.3
5,000	10,000	15	0.4
10,000	15,000	35	0.5
15,000	20,000	60	0.6
20,000	25,000	90	0.7
25,000	30,000	125	0.8
30,000	35,000	165	0.9
35,000	40,000	210	1.0
40,000	45,000	260	1.1
45,000	50,000	315	1.2
50,000	60,000	375	1.3
60,000	70,000	505	1.4
70,000	80,000	645	1.5
80,000	90,000	795	1.6
90,000	100,000	955	1.8
100,000	110,000	1,135	2.0
110,000	120,000	1,335	2.2
120,000	upwards	1,555	2.4

**LOCAL GOVERNMENT RATES.** The *Local Government Act 1960-1980* empowers municipalities to impose tax based on a rate in the dollar of the value of all land (except for certain specified exemptions) within the municipality. The method of determining the rate is described in the section *The Local Government System* in Chapter III.

**METROPOLITAN REGION IMPROVEMENT TAX.** The *Metropolitan Region Improvement Tax Act 1959-1976* authorises a tax, with certain specified exemptions, on every owner of land within the Metropolitan Planning Region. (The Region is coterminous with the Perth Statistical Division; see maps inside back cover.) The rate of tax payable for the assessment year 1979-80 was one quarter of a cent for every dollar of the unimproved value of all land chargeable with the tax.

**LIQUOR LICENCES.** Licences and permits authorising the holder to sell or supply fermented and spirituous liquors are granted under the provision of the *Liquor Act 1970-1979*. The Act prescribes the fees payable in respect of liquor licences and permits. The several types of licence for which the Act provides are shown in the table *Liquor Licences in Force* in Chapter V, Part 6. Annual licence fees, except in the case of a vigneron's licence, are assessed as a proportion of



the gross amount paid for liquor purchased for licensed premises or, in the case of a wholesale licence and a brewer's licence, the gross amount received for liquor sold. The proportion prescribed by the Act is 8 per cent for a tavern licence or a store licence and 7 per cent for other licences. An additional annual fee of \$60 is payable in respect of a wholesale licence and a brewer's licence. The annual fee payable for a vigneron's licence is \$20.

**TOBACCO LICENCES.** The *Business Franchise (Tobacco) Act 1975-1980* provides for the licensing of persons engaged in tobacco wholesaling and retailing. The fee payable for a wholesale tobacco merchant's licence is \$100 plus 10 per cent of the value of tobacco sold in the course of intrastate trade in the assessment year. For a retail tobacconist, the fee is \$10 annually plus 10 per cent of the value of tobacco sold other than tobacco purchased from a wholesaler in the course of intrastate trade.

**LOTTERIES PROFITS.** The *Lotteries (Control) Act 1954-1972* empowers the Lotteries Commission to conduct lotteries and other similar devices. To maintain comparability with privately operated lotteries in other States (where profits are taxed) and because the main purpose of the Lotteries Commission is to raise revenue for charitable purposes, the whole of the profit is treated as a tax in accordance with the guidelines provided in the document, *A System of National Accounts* published by the United Nations.

**TOTALISATOR AGENCY BOARD BETTING TAX.** The *Totalisator Agency Board Betting Tax Act 1960-1973* imposes a tax on all moneys paid to the Board in respect of bets made through or with the Board. The rate of tax payable at 30 June 1980 was 6 per cent.

**TOTALISATOR DUTY AND LICENCES.** The *Totalisator Duty Act 1905-1973* authorises the payment of duty on the takings of totalisators operated by horse-racing clubs and prescribes the rates to be paid. Differential rates apply to totalisators operated within a radius of forty kilometres from the General Post Office, Perth and those situated outside this area. In 1979-80, the principal rates of duty payable in respect of totalisators in the former area were 9 per cent of the gross takings from win and place transactions and 5 per cent of the gross takings from wagering transactions known as 'jack pots', 'quinellas' and 'doubles'; for totalisators outside that area, the rate was 5 per cent for all transactions. The *Totalisator Regulation Act 1911-1973* provides for the licensing of totalisators operated by horse-racing clubs. Licence fees are prescribed by regulation and are payable annually in respect of the calendar year. For the year 1980 the fee payable was \$2 for each \$2,000 (or part of \$2,000) passing through the totalisator.

**BOOKMAKERS BETTING TAX.** The *Bookmakers Betting Tax Act 1954-1970* provides for a tax on money paid or promised as the consideration for bets made by or on behalf of bookmakers. Rates of tax are prescribed as a proportion of the turnover of a racing year (1 August to 31 July). In respect of turnover of the year ended 31 July 1980 the rates applying to on-course transactions were 2 per cent of amounts up to \$100,000 and 2½ per cent of the remainder. For off-course transactions the rate was 2¼ per cent of amounts up to \$50,000, the rate payable on each additional \$50,000 of turnover increasing by ½ per cent up to \$300,000; on turnover exceeding \$300,000 the rate was 3½ per cent.

**STAMP DUTIES.** The *Stamp Act 1921-1980* imposes stamp duties and prescribes the rates applying to a great number of transactions relating to a wide range of property, commodities and services.

**MOTOR VEHICLE REGISTRATION FEES.** The *Road Traffic Act 1974-1980* provides for the registration of vehicles and prescribes the licence fees to be paid in respect of the several classes of vehicles required to be registered. Fees are based on a combination of power unit and tare weight (except for motor cycles, in respect of which the fee is related to engine capacity). For example, the annual licence fee for a motor car with an engine other than a rotary type is \$1.07 per power unit and an additional \$0.86 for each 51 kilograms of the tare weight. The annual licence fee for a motor cycle is \$7.20 where the engine capacity is 250 cubic centimetres or less, and \$9.40 where the engine capacity is more than 250 cubic centimetres. A recording fee of \$4 is payable for the grant or renewal of any licence for a vehicle, and a fee of \$3 for the transfer of any licence.

**MOTOR VEHICLE DRIVERS' LICENCES.** The *Road Traffic Act 1974-1980* authorises the issue of drivers' licences to persons of a minimum age of seventeen years, specifies other conditions to be satisfied, and prescribes the fees to be paid on application for, and issue or renewal of, a licence. The fee payable on application is \$4, and on issue or on renewal for each period of twelve months, \$7 (or \$1 in the case of a licence to drive a vehicle for the carrying of passengers for reward).

**OMNIBUS AND COMMERCIAL VEHICLE LICENCES AND FEES.** The *Transport Act 1966-1980* provides for the licensing of public vehicles in the categories of omnibus, commercial goods vehicle, trailer or semi-trailer, and aircraft, as well as ships engaged in the coasting trade. Licence fees are as determined from time to time by the Commissioner of Transport, subject to certain maximum charges prescribed by the Act. In the case of an omnibus, for example, the fee may not exceed 6 per cent of the gross earnings, or \$10 per annum for each unit of the maximum number of passengers which it is licensed to carry, the basis of assessment being that considered by the Commissioner to be the more appropriate.

**TAXI CONTROL BOARD LICENCES.** The *Taxi-cars (Co-ordination and Control) Act 1963-1980*, under which the Taxi Control Board is constituted, requires that taxi-cars operating in the Metropolitan Traffic Area and other areas as declared shall be licensed, and prescribes maximum fees payable. At 31 December 1980 these fees were \$100 on the issue or annual renewal of a licence where the licence is issued for unrestricted operations in the metropolitan area or, in any other cases, \$60. For the transfer of a licence the fee is a percentage, as determined by the Board, (not exceeding 10 per cent) of the market value of the taxi-car licence at the time of transfer.

**ROAD MAINTENANCE CONTRIBUTION.** The *Road Maintenance (Contribution) Act 1965-1978* was repealed by the *Acts Amendment and Repeal (Road Maintenance) Act 1979* with effect from 1 July 1979.

**PETROLEUM PRODUCTS LICENSING.** The *Transport Commission Act 1966-1979* as amended by the *Acts Amendment and Repeal (Road Maintenance) Act 1979* provides for the licensing of persons engaged in wholesaling petroleum products. The fee payable for such a licence for any period up to 30 June 1980 was \$500 plus 0.9 cents for every litre of motor spirit and 3 cents for every litre of diesel fuel wholesaled by the applicant in the period from 1 April 1978 to 31 March 1979. As from 1 July 1980 the fee payable was to be \$500 together with an amount as prescribed for every litre of motor spirit and diesel fuel wholesaled by the applicant in the year ending on the 31st day of March last preceding the date on which the licence comes into force. For fuel wholesaled between 1 April 1979 and 31 March 1981 the prescribed fees for each litre were 1.3 cents for motor spirit and 3 cents for diesel fuel.

**MOTOR VEHICLE THIRD PARTY INSURANCE SURCHARGE.** The *Motor Vehicle (Third Party Insurance Surcharge) Act 1962-1976* imposes a surcharge on premiums paid in respect of policies of insurance with The Motor Vehicle Insurance Trust. At 31 December 1980 the rate of the surcharge was \$5 per annum.

**OFF-ROAD VEHICLE REGISTRATION FEES.** The *Control of Vehicles (Off-road areas) Act 1978* provides for the registration of off-road vehicles. At 31 December 1980, the annual fee prescribed for registration of a vehicle under the Act was \$4.

**PAY-ROLL TAX.** Pay-roll tax, which was formerly levied by the Commonwealth Government has been collected by the States since September 1971. In Western Australia the enabling legislation comprises the *Pay-roll Tax Assessment Act 1971-1979* and the *Pay-roll Tax Act 1971-1974*. The tax is payable by each employer, with certain specified exceptions, on all wages and salaries paid in excess of \$6,000 per month (\$72,000 per annum). The rate of tax prescribed by the *Pay-roll Tax Act 1971-1974* is 5 per cent.

CONTRIBUTIONS FROM INSURANCE COMPANIES TO FIRE BRIGADES. The *Fire Brigades Act 1942-1979* specifies that 75 per cent of the estimated expenditure of the Fire Brigades Board be contributed by insurance companies by way of a compulsory levy which is based on a declared percentage of gross premiums of each insurance company.

OTHER TAXES, FEES, FINES, ETC. consists of payments to public authorities by individuals and households, private non-profit organisations and corporate or quasi-corporate enterprises. Examples are firearm licences; boat registration fees; statutory levies on public corporations comprising the State Energy Commission, Metropolitan Water Supply, Sewerage, and Drainage Board and the Fremantle Port Authority; and judicial fines.

STATE AND LOCAL AUTHORITIES: TAXATION BY TYPE OF TAX  
(\$'000)

Item	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79
Estate, gift, probate and succession duties	10,101	10,005	11,662	12,758	14,762	15,082
Property —						
Land tax	10,186	10,467	12,090	11,749	14,747	17,634
Local government rates	38,241	49,554	62,439	69,961	79,577	89,766
Metropolitan improvement rates	1,428	1,541	1,692	2,188	2,624	3,280
Other	—	—	—	182	130	188
Total, Property	49,855	61,562	76,221	84,080	97,078	110,868
Liquor licences	5,933	6,908	9,018	11,177	12,850	14,358
Tobacco licences	..	..	3,577	7,549	8,333	8,962
Gambling —						
Lotteries Commission	2,807	3,898	5,529	5,898	6,198	6,168
Racing —						
Totalisator Agency Board betting tax	5,733	7,014	8,141	9,010	10,334	11,226
Totalisator duty and licences	1,341	1,653	2,084	2,219	2,240	2,482
Bookmakers' betting tax and licences	648	723	860	1,028	1,105	1,289
Stamp duty	81	89	87	90	89	83
Total, Gambling	10,610	13,377	16,701	18,245	19,966	21,250
Ownership and operation of motor vehicles —						
Vehicle registration fees and taxes	17,311	26,740	32,191	35,963	44,861	48,956
Drivers' licences and fees	1,850	2,755	4,798	3,510	3,775	6,242
Stamp duty on vehicle registration	2,994	3,205	4,396	5,507	5,891	6,215
Road transport taxes —						
Omnibus and commercial vehicle licences and fees	1,002	1,280	1,423	1,539	2,032	2,039
Overload permits	233	241	264	300	204	190
Taxi licence fees	102	101	73	125	125	105
Road maintenance contribution	3,682	4,178	4,451	4,617	5,193	5,698
Motor vehicle third party insurance surcharge	2,592	2,754	2,930	3,170	3,311	3,373
Total, Motor vehicles	29,766	41,254	50,526	54,731	65,392	72,818
Pay-roll tax	48,990	75,013	91,877	106,229	119,349	126,911
Fire Brigade contributions from insurance companies	4,460	7,600	9,280	10,083	12,173	13,801
Stamp duties n.e.c.	28,019	26,741	39,904	49,071	55,067	59,907
Other taxes, fees, fines, etc.	7,786	13,001	16,041	18,900	19,796	24,750
GRAND TOTAL	195,520	255,461	324,807	372,825	424,766	468,707

### PENSION AND SUPERANNUATION SCHEMES

The Western Australian Government and many local government authorities and public corporations have established pension and superannuation schemes for eligible employees and their dependants, to which both employers and employees contribute. These schemes are operated either through separately constituted funds or through life insurance offices.

The *Superannuation and Family Benefits Act 1938-1979* applies to employees of State Government Departments and some other public authorities. The Act establishes The Superannuation Fund and a Provident Account under the management of a Superannuation Board. Contributions made by the State are paid from the Consolidated Revenue Fund.

The *Superannuation, Sick, Death, Insurance, Guarantee and Endowment (Local Governing Bodies' Employees) Funds Act 1947-1975* enables local government authorities to establish funds to provide benefits for their employees. Contributions made by an authority are paid from its ordinary revenue. Although this Act was repealed and replaced by the *Local Government Superannuation Act 1980*, the new superannuation scheme will not come into effect before 1981-82.

In the following table, particulars are given of pension and superannuation schemes established by the State Government, local government authorities, public corporations, the University of Western Australia, Murdoch University, and The Western Australian Institute of Technology. Particulars of the Parliamentary Superannuation Fund and the Coal Mine Workers' Pensions Fund are also included. Separate details are shown for schemes operated through separately constituted funds and for those operated through life insurance offices.

PUBLIC AUTHORITY PENSION AND SUPERANNUATION SCHEMES  
(\$'000)

Item	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79
Separately constituted funds —						
Income —						
Contributions towards premiums by —						
Employees	8.665	11.718	14.007	15.893	17.598	19.314
Employers	10.001	12.989	17.188	22.397	28.628	34.347
Other income	5.344	7.074	9.404	12.382	15.414	17.944
Total	24.010	31.781	40.599	50.672	61.640	71.604
Expenditure —						
Benefits to contributors	16.667	17.169	22.609	29.170	36.395	41.432
Other expenditure	589	855	376	152	393	516
Total	17.256	18.024	22.986	29.322	36.788	41.948
Schemes operated through life insurance offices —						
Income —						
Contributions towards premiums by —						
Employees	1.541	2.015	2.445	2.958	3.304	3.575
Employers	2.295	2.884	4.001	4.849	5.295	5.644
Other income	643	743	1.164	1.907	2.274	5.113
Total	4.478	5.642	7.610	9.714	10.873	14.332
Expenditure —						
Benefits to contributors	590	683	1.063	1.796	2.340	4.346
Other expenditure (including premiums)	3.858	4.996	6.715	8.074	9.060	8.139
Total	4.449	5.679	7.778	9.870	11.400	12.485
Assets of separately constituted funds —						
Cash and deposits —						
Deposits with Treasury	1.707	2.215	3.020	6.241	6.103	5.091
Other deposits and cash	342	435	688	110	763	134
Public authority securities —						
Australian Government	163	163	163	163	180	183
Other	59.001	68.269	78.481	89.853	99.960	114.421
Mortgages —						
Housing	1.206	1.013	1.214	1.993	5.679	4.146
Other	2.667	3.261	5.112	8.460	11.511	19.935
Loans to building societies	1.322	741	1.057	259	1.000	914
Company shares, debentures and notes	2.654	4.625	6.244	7.434	6.403	8.470
Other assets	12.955	15.257	17.762	20.902	28.569	37.078
Total	82.018	95.980	113.740	135.416	160.170	190.373
Less sundry creditors, etc.	346	551	719	1,066	970	1,517
Accumulated funds	81.672	95.429	113.022	134.350	159.201	188.857

The *Parliamentary Superannuation Act 1970-1980* establishes a Parliamentary Superannuation Fund to provide superannuation, pensions and other benefits for former Members of the Parliament of Western Australia and their dependants. The fund is financed from contributions paid by members and moneys appropriated from the Consolidated Revenue Fund.

The *Coal Mine Workers (Pensions) Act 1943-1980* establishes a Coal Mine Workers' Pensions Fund to provide pensions and other benefits for persons formerly engaged in coal mining and for their dependants. The Fund is financed from contributions paid by employees and employers and moneys appropriated from the Consolidated Revenue Fund.

## Chapter VI—continued

### Part 2 — Private Finance

#### CURRENCY

The power to legislate with respect to currency, coinage and legal tender and the issue of paper money is vested by the Constitution in the Commonwealth Parliament. This power was originally exercised by the Commonwealth Government under the Coinage Act of 1909 and the Australian Notes Act of 1910. These Acts and later amendments were superseded by the *Reserve Bank Act* 1965 and the *Currency Act* 1965 when a decimal currency system was adopted in Australia with effect from 14 February 1966.

Prior to 14 February 1966 the Australian currency was based on the system then in use in the United Kingdom, and therefore had as its unit the pound (£) divided into twenty shillings (s.) each of twelve pence (d.). The *Currency Act* 1965, provided for the adoption of a monetary unit known as the 'dollar', which is divided into 100 minor units, or 'cents'. Coins are in the denominations of 50 cents, 20 cents, 10 cents, 5 cents, 2 cents and 1 cent. The *Reserve Bank Act* 1965 authorises the issue of notes in the denomination of 1 dollar, 2, 5, 10, 20, and 50 dollars, or in any other denomination that the Treasurer determines and notes are currently issued in all of these.

Australian notes are legal tender in Australia to any amount, coins of the denominations of 5, 10, 20 and 50 cents for amounts not exceeding five dollars, and two-cent and one-cent coins for amounts up to and including 20 cents.

#### Rates of Exchange

The following table shows the average telegraphic transfer selling rates of exchange for Australia on a selection of overseas countries. The figures appearing in the table, which are averages of daily quotations, are based on rates quoted by the Commonwealth Trading Bank of Australia.

OVERSEAS EXCHANGE RATES — TELEGRAPHIC TRANSFER SELLING RATES FOR  
AUSTRALIA ON OVERSEAS COUNTRIES: YEAR ENDED JUNE 1980

Country	Currency	Number to \$A1	Country	Currency	Number to A\$1
Austria	Schillings	14.27	Netherlands	Guilders	2.185
Belgium (a) —			New Caledonia	Francs	83.76
Financial rate	Francs	32.88	New Zealand	Dollars	1.126
Convertible rate	Francs	31.95	Norway	Kroner	5.50
Canada	Dollars	1.2937	Pakistan	Rupees	10.83
China, People's Republic of	Renminbi	1.678	Philippine Islands	Pesos	8.035
Denmark	Kroner	6.00	Singapore	Dollars	2.398
Fiji	Dollars	0.919	South Africa	Rands	0.9054
France	Francs	4.630	Spain	Pesetas	74.81
Germany, Federal Republic of	Deutsche Marks	1.982	Sri Lanka	Rupees	16.784
Greece	Drachmae	42.70	Sweden	Kronor	4.669
Hong Kong	Dollars	5.526	Switzerland	Francs	1.828
India	Rupees	8.828	Thailand	Bahts	22.34
Italy	Lire	916.000	United Kingdom	Pounds	0.497
Japan	Yen	257.56	United States of America	Dollars	1.1112

(a) The 'convertible' rate applies to trade transactions accompanied by documentation; in respect of other transactions the 'financial' rate applies.

## BANKING

The banking system in Western Australia comprises the Commonwealth banking institutions, The Rural and Industries Bank of Western Australia and the private trading banks, summary details of which are given below.

### **Commonwealth Banking Institutions**

Prior to the operation of the Reserve Bank Act and the Commonwealth Banks Act, passed by the Commonwealth Parliament in 1959, the Commonwealth banking institutions were the Commonwealth Bank, the Commonwealth Trading Bank and the Commonwealth Savings Bank. The Commonwealth Bank, in addition to performing the functions of a central bank, controlled the Australian note issue through a Note Issue Department and also provided special banking facilities through the Rural Credits Department, the Mortgage Bank Department and the Industrial Finance Department. The policy of the Banks was determined by a Commonwealth Bank Board.

The *Reserve Bank Act* 1959 repealed the Commonwealth Bank Acts, first of which was passed in 1911, and established the Reserve Bank of Australia under the control of a Reserve Bank Board. The Reserve Bank was constituted as the central bank and took over the Note Issue Department and the Rural Credits Department of the former Commonwealth Bank. The function of the Rural Credits Department is to make available to statutory authorities or co-operative associations of primary producers advances to assist the marketing or processing of primary products.

The *Commonwealth Banks Act* 1959 constituted the Commonwealth Banking Corporation, which came into being on 14 January 1960 as the authority responsible for the operations of the Trading Bank, the Savings Bank and a new Development Bank. The Development Bank was formed basically from the Mortgage Bank Department and the Industrial Finance Department of the Commonwealth Bank, to provide finance and advice to persons to assist them in primary production or in the establishment or development of industrial undertakings, particularly small enterprises.

### **The Rural and Industries Bank of Western Australia**

The Rural and Industries Bank of Western Australia was established by the State Government under the Rural and Industries Bank Act of 1944 to replace the former Agricultural Bank of Western Australia. The Bank consists of a Rural Department and a Government Agency Department, and management is vested in five Commissioners. The Rural Department provides general banking services and, since 1956, has also conducted savings bank business through a Savings Bank Division.

### **Trading Banks**

At 30 June 1980 the trading banks conducting business in Western Australia comprised the Commonwealth Trading Bank of Australia, The Rural and Industries Bank of Western Australia (Rural Department), the Australia and New Zealand Banking Group Limited, The Bank of Adelaide, the Bank of New South Wales, the Banque Nationale de Paris, The Commercial Bank of Australia Limited, The Commercial Banking Company of Sydney Limited and The National Bank of Australasia Limited.

The operations of trading banks are governed by the *Banking Act* 1959 (Commonwealth) which places them under a degree of control by the central bank, the Reserve Bank of Australia.

The following table shows the averages of total amounts on deposit with the trading banks and of their outstanding advances during each of the years 1974-75 to 1979-80. The figures relate to Western Australian business only and represent the annual average of amounts as at the close of business each Wednesday. The information is prepared from returns furnished under the requirements of the *Banking Act* 1959 by all trading banks except The Rural and Industries Bank of Western Australia, which supplies information by special arrangement.

### TRADING BANKS — AVERAGES OF DEPOSITORS' BALANCES AND BANK ADVANCES (\$'000)

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Depositors' balances —						
Commonwealth Government and State Government —						
Fixed	51,435	43,517	142,153	156,673	171,242	158,948
Current —						
Bearing interest	12	16	1,275	4,056	2,057	2,526
Not bearing interest	4,291	4,930	4,800	2,183	4,251	4,843
Other than Commonwealth Government and State Government —						
Fixed	433,706	512,646	631,435	670,993	773,628	797,802
Current —						
Bearing interest	36,998	45,218	43,316	41,059	43,947	55,035
Not bearing interest	380,150	486,026	553,834	573,245	626,729	723,647
Total	906,589	1,092,350	1,376,813	1,448,208	1,621,852	1,742,801
Loans, advances and bills discounted (a)	673,526	791,376	927,708	1,163,207	1,368,657	1,678,121
Ratio of loans, advances, etc. to total balances (per cent)	74.3	72.4	67.4	80.3	84.4	96.3

(a) Excludes loans to authorised dealers in the short-term money market.

In the following table, which relates to Western Australian business only, the average amount on deposit with each trading bank and the average of its outstanding advances during the month of June 1980 are shown, together with the number of branches and agencies of each bank at 30 June 1980.

### TRADING BANKS — BRANCHES, AGENCIES, DEPOSITS AND ADVANCES: JUNE 1980

Bank	Number of branches (a)	Number of agencies (a)	Depositors' balances (b)			Loans, advances, and bills discounted (b) (c)
			Not bearing interest	Bearing interest	Total	
			\$'000	\$'000	\$'000	\$'000
Commonwealth Trading Bank of Australia	84	29	130,814	168,634	299,448	307,341
The Rural and Industries Bank of Western Australia (Rural Department)	84	19	117,714	318,634	436,347	452,771
Other trading banks —						
Australia and New Zealand Banking Group Limited	72	17	115,048	119,397	234,445	227,474
The Bank of Adelaide	4	—	2,880	7,203	10,083	10,224
Bank of New South Wales	131	27	187,320	177,362	364,682	415,093
Banque Nationale de Paris	1	—	1,606	29,502	31,108	7,911
The Commercial Bank of Australia Limited	43	3	50,488	50,365	100,853	101,376
The Commercial Banking Company of Sydney Limited	9	—	9,650	12,276	21,926	16,966
The National Bank of Australasia Limited	85	16	117,024	131,237	248,261	287,366
Total, Other trading banks	345	63	484,016	527,342	1,011,358	1,066,410
TOTAL, ALL TRADING BANKS	513	111	732,544	1,014,610	1,747,152	1,826,522

(a) At 30 June. (b) Averages based on amounts at close of business each Wednesday. (c) Excludes loans to authorised dealers in the short-term money market.

In July 1980 the outstanding advances of the trading banks, excluding The Rural and Industries Bank of Western Australia and the Banque Nationale de Paris, amounted in total to \$1,410.2 million. Business advances represented \$843.9 million, personal advances \$544.2 million, advances to non-profit organisations \$8.1 million, and to public authorities other than the Commonwealth Government and the State Government \$13.5 million. Business advances were mainly for rural industry (\$253.4 million), for retail and wholesale trade (\$161.3 million) and for mining (\$57.6 million). Of the personal advances, loans for the building or purchasing of homes accounted for \$72.2 million.



The following table contains particulars of the average weekly debits to customers' accounts in each year from 1974-75 to 1979-80 and in each quarter of those years. The figures represent the total of all cheques and charges debited to accounts of customers of all trading banks and, in addition, the Rural Credits Department of the Reserve Bank of Australia and the Commonwealth Development Bank of Australia. Debits to Commonwealth Government and State Government accounts at city branches are excluded as they are subject to abnormal influences. The figures are derived by averaging the debits made during weeks ended on Wednesdays during the several periods shown.

**TRADING BANKS**  
**AVERAGE WEEKLY DEBITS TO CUSTOMERS' ACCOUNTS (a)**

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
WEEKLY AVERAGE (\$ million)						
Average for quarter ended —						
September	472.5	614.8	731.6	890.5	1,155.2	1,354.4
December	516.0	675.4	809.1	979.0	1,020.9	1,437.0
March	508.6	688.4	842.8	991.7	1,164.2	1,530.6
June	566.5	741.6	874.2	1,042.3	1,266.7	1,531.3
Average for year	515.9	680.0	814.4	975.9	1,151.8	1,463.3
PER HEAD OF MEAN POPULATION (dollars)						
Average for quarter ended —						
September	429.8	546.0	623.7	741.8	943.2	1,087.5
December	464.4	595.8	685.7	810.8	830.4	1,148.8
March	453.5	602.4	710.0	816.8	943.4	1,218.3
June	504.1	646.8	732.4	854.6	1,022.2	1,213.4
Average for year	463.1	597.6	687.2	806.2	935.0	1,167.3

(a) Excludes debits to Commonwealth Government and State Government accounts at city branches.

**Bank Charges.** These charges, comprising three separate elements, are calculated quarterly and debited as one composite item. In addition to a basic maintenance fee, there is a ledger activity fee, and a collection fee on cheques deposited in excess of twenty per quarter. Rebates are allowable on ledger activity fees where credit balances are maintained at the level of \$1,000 or more throughout the quarterly period.

### Savings Banks

At 31 December 1980 savings banks operating in Western Australia comprised the Commonwealth Savings Bank of Australia, The Rural and Industries Bank of Western Australia (Savings Bank Division), the Australia and New Zealand Savings Bank Limited, The Bank of Adelaide Savings Bank Limited, the Bank of New South Wales Savings Bank Limited, The Commercial Savings Bank of Australia Limited, the C.B.C. Savings Bank Limited and The National Bank Savings Bank Limited.

Individual depositors may not operate on their savings bank accounts by cheque, but cheque accounts are generally available to non-profit organisations such as friendly, co-operative and charitable societies. Interest is paid on deposits with savings banks and no charge is made for the keeping of accounts. A school savings bank service is provided and its operations, except for the number of accounts open at the end of each year, are included in the figures shown in the following table which shows savings bank transactions for each of the years 1974-75 to 1979-80.

## SAVINGS BANK TRANSACTIONS

Particulars		1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Deposits (a)	\$'000	1,625,973	1,895,449	2,056,604	2,248,260	2,447,263	2,744,802
Withdrawals (a)	\$'000	1,565,650	1,818,297	2,040,154	2,210,319	2,415,916	2,721,126
Excess of deposits over withdrawals	\$'000	60,323	77,152	16,450	37,941	31,347	23,676
Interest added to accounts	\$'000	34,123	41,114	46,405	50,021	53,770	58,879
Accounts open at end of year (b)	No.	1,401,485	1,443,883	1,466,200	1,511,092	1,539,416	1,579,722
Depositors' balances at end of year —							
Total	\$'000	779,427	897,693	960,548	1,048,510	1,133,627	1,216,182
Average per operative account	\$	556	622	655	694	736	770
Average per head of population	\$	694	800	812	861	920	970

(a) Includes inter-branch transfers but excludes transfers from and to other States. (b) Excluding inoperative accounts (i.e. accounts of less than \$2 which have not been operated on for more than two years).

The following table, which relates to Western Australian business only, shows the number of branches and agencies of each of the savings banks at 30 June 1980. The amount of depositors' balances held by each bank at the end of June 1980 is also shown. This information, together with similar particulars for each of the other Australian States, is published monthly in the *Commonwealth of Australia Gazette*, and is prepared from returns furnished under the requirements of the *Banking Act* 1959 by all savings banks except The Rural and Industries Bank of Western Australia (Savings Bank Division), which supplies information by special arrangement.

SAVINGS BANKS — BRANCHES, AGENCIES AND DEPOSITS  
JUNE 1980

Bank	Number of branches (a)	Number of agencies (a)	Depositors' balances (b) \$'000
Commonwealth Savings Bank of Australia	94	594	462,497
The Rural and Industries Bank of Western Australia (Savings Bank Division)	84	519	287,442
Other savings banks —			
Australia and New Zealand Savings Bank Limited	72	175	113,451
The Bank of Adelaide Savings Bank Limited	4	1	2,379
Bank of New South Wales Savings Bank Limited	131	421	207,989
The Commercial Savings Bank of Australia Limited	43	3	41,017
C.B.C. Savings Bank Limited	9	4	8,012
The National Bank Savings Bank Limited	85	47	93,395
Total, Other savings banks	344	651	466,243
TOTAL, ALL SAVINGS BANKS	522	1,764	1,216,182

(a) At 30 June. (b) Particulars for the Commonwealth Savings Bank and The Rural and Industries Bank of Western Australia (Savings Bank Division) relate to 30 June, and those for other savings banks to the last Wednesday in June.

In December 1969 approval was given by the Reserve Bank of Australia to a proposal for the establishment of a new type of savings bank account on which interest could be paid at rates above the general deposit rate paid by savings banks. The holder of such an account is required to comply with certain conditions relating to its operation, these conditions varying between banks. Notice is required before a withdrawal may be made, the account must have, at all times, a specified minimum balance and transactions are in minimum amounts of \$100. The maximum rate of interest payable on these 'investment' accounts at 30 June 1980 was 8.50 per cent per annum.

**Bank Interest Rates**

The following table shows bank interest rates current at 30 June 1980, the dates from which they became operative, and the rates which were applicable prior to those dates, for both loans and deposits.

## BANK INTEREST RATES AT 30 JUNE 1980

Particulars	Rate per annum per cent	Date from which operative	Previous rate per annum per cent
LENDING RATES			
Trading banks —			
Overdraft —			
Less than \$100,000 (a)	10.50	1976 — February	11.50
\$100,000 and over	(b)	1972 — February	8.25
Unsecured personal loans (a) (c)	7.75	1980 — February	7.50
Commonwealth Development Bank of Australia —			
Rural loans (d)	10.50	1980 — April	10.00
Other business (d)	10.50	1980 — April	10.00
Reserve Bank of Australia, Rural Credits Department	9.50-10.00	1980 — March	9.00-9.50
Savings banks —			
Housing loans to individuals (e)	9.25-10.50	1980 — April	8.75-10.50
Other loans —			
Less than \$100,000 (a)	10.50	1976 — February	11.50
\$100,000 and over	(b)	1972 — March	7.75
DEPOSIT RATES			
Trading banks —			
Fixed deposits of less than \$50,000 —			
3 months and less than 6 months	8.00-8.50	1980 — April	7.50-8.00
6 months and less than 2 years	8.50-10.00	1980 — June	8.50-9.50
2 years and less than 4 years	9.00-10.00	1980 — April	8.00-9.50
Fixed deposits of \$50,000 and over (a) (b) —			
30 days to 4 years	10.00	1974 — July	8.00
Certificates of deposit of \$50,000 and over (b) —			
3 months to 4 years	(f)	1974 — September	6.50
Savings banks —			
Ordinary accounts (g) —			
\$4,000 and under	3.75-5.00	1978 — December	3.75-5.25
Over \$4,000	5.00-6.25	1978 — April	6.00-6.50
Investment accounts (h)	8.00-8.50	1980 — April	7.50-8.25

(a) Maximum rate. (b) Actual rates are a matter for negotiation between banks and their customers. (c) Flat rate. (d) Basic rate. (e) Standard range of rates on new loans. (f) Not subject to maximum rate. (g) The lower rate shown has predominated in the case of most banks. (h) Subject to special notice and minimum balance requirements.

## INSURANCE

## General Insurance

General insurance is available to the public in Western Australia from a number of companies and, in some fields, from the State Government Insurance Office. During 1979-80 there were 92 general insurance companies operating in Western Australia. There is also a Motor Vehicle Insurance Trust whose activities are confined to motor vehicle third party insurance.

The *Insurance Act 1973* (Commonwealth) established a comprehensive system of supervision of general insurance business throughout Australia. The Act prescribes minimum standards of financial soundness and authorises the investigation of any insurer who fails to meet the required standards or who appears to be likely to fall below those standards. The Act provides for the appointment of an Insurance Commissioner who is responsible, subject to any directions of the Treasurer, for the administration of the legislation.

The State Government Insurance Office covers fire, marine and general insurance risks for State Government instrumentalities and semi-government and local government authorities. It also conducts some classes of insurance business for the general public, the principal transactions being employers' liability (workers' compensation) and comprehensive motor vehicle insurance. By authority of amendments to the State Government Insurance Office Act in 1954 and 1958 the Office engages in personal accident insurance in respect of school children and students under a policy which indemnifies the parent or guardian against the cost of medical and surgical treatment and funeral and other expenses.

The following table gives details of general insurance transactions during each of the years from 1974-75 to 1979-80. The amounts shown as 'Premiums' represent the full amount receivable in respect of policies issued or renewed during the year, less stamp duty, returns, rebates and bonuses paid or credited to policy holders during the year. They are not adjusted to provide for premiums unearned at the end of the year and consequently the amounts differ from 'earned premium income' appropriate to the year. The amounts shown as 'Claims' include provision for outstanding claims and represent claims or losses incurred during the year. Salvage and other amounts recoverable have been deducted. The transactions of The Motor Vehicle Insurance Trust are included and they are also shown separately in the table in the section *Motor Vehicle Third Party Insurance*.

GENERAL INSURANCE (a)  
(\$'000)

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
<b>Premiums —</b>						
Fire	14,678	17,387	18,398	18,375	17,286	18,640
Crop	4,011	4,809	4,392	2,977	3,811	4,585
Houseowners' and householders'	10,386	14,487	15,230	18,771	20,108	22,926
Marine	3,934	4,938	6,136	6,221	7,183	8,355
Motor vehicle comprehensive	36,169	43,100	54,629	64,065	68,809	73,404
Compulsory third party	14,721	17,266	25,751	27,211	35,122	39,392
Employers' liability	31,947	45,627	61,248	73,199	72,375	69,278
Public liability	2,375	2,554	3,593	3,957	4,299	4,894
Personal accident	4,631	5,202	6,343	5,163	6,036	6,494
Other	11,079	12,129	14,811	18,103	20,454	23,657
<b>Total, Premiums</b>	<b>133,931</b>	<b>167,499</b>	<b>210,531</b>	<b>238,042</b>	<b>255,483</b>	<b>271,625</b>
<b>Claims —</b>						
Fire	11,073	12,007	4,395	9,291	13,165	13,102
Crop	2,666	1,223	1,464	3,248	3,025	4,321
Houseowners' and householders'	5,608	7,138	6,919	11,875	15,544	14,420
Marine	2,838	3,704	4,097	3,296	5,613	6,344
Motor vehicle comprehensive	25,034	27,443	34,080	44,098	49,574	49,932
Compulsory third party	25,004	16,354	31,512	40,657	53,261	65,049
Employers' liability	37,593	45,517	50,428	63,354	46,172	44,315
Public liability	1,759	1,031	1,606	1,817	1,899	2,765
Personal accident	1,759	1,887	2,302	2,050	2,587	3,270
Other	6,255	7,475	7,273	7,890	9,668	11,214
<b>Total, Claims</b>	<b>119,590</b>	<b>123,779</b>	<b>144,076</b>	<b>187,576</b>	<b>200,508</b>	<b>214,732</b>

(a) From 1977-78 premium and claim details for brokers have been excluded. Transactions of The Motor Vehicle Insurance Trust and the State Government Insurance Office are included.

### Life Insurance

Life insurance business throughout Australia is regulated by the *Life Insurance Act 1945* (Commonwealth), which requires companies to be registered by the Life Insurance Commissioner appointed under the Act. The purpose of the Act, which supersedes State legislation, is to place life insurance business on a uniform basis throughout the Commonwealth and to afford protection to policy holders.

At 30 June 1980, there were thirty-five life insurance companies or societies operating in Western Australia. In terms of total sums insured, life insurance policies relate predominantly to ordinary endowment or whole-of-life insurance and superannuation, although an appreciable volume of industrial business is also undertaken.

Details of policies, sums insured and annual premiums for each class of business are given in the following table for the years 1974-75 to 1979-80.

## LIFE INSURANCE

Year	New policies issued			Policies discontinued or reduced			Policies, etc. existing at end of year		
	Policies	Sum insured	Annual premiums	Policies	Sum insured	Annual premiums	Policies	Sum insured	Annual premiums
	Number	\$m	\$m	Number	\$m	\$m	Number	\$m	\$m
ORDINARY AND INDUSTRIAL BUSINESS									
1974-75	57,685	648.1	9.9	50,839	233.9	4.8	669,487	3,316.5	66.4
1975-76	52,955	730.2	10.2	52,423	264.1	5.5	670,019	3,782.4	71.2
1976-77	52,969	897.0	11.0	55,278	362.6	6.7	667,710	4,316.7	75.5
1977-78	51,772	1,006.6	10.8	62,406	438.9	7.7	656,632	4,883.5	78.6
1978-79	50,850	1,137.8	11.6	67,030	471.9	9.3	641,111	5,583.8	81.3
1979-80	47,526	1,243.6	12.6	73,942	772.6	10.5	617,297	6,051.3	83.7
SUPERANNUATION BUSINESS									
1974-75	8,535	264.9	7.4	4,710	74.3	2.4	49,574	764.7	22.6
1975-76	11,007	358.8	10.1	5,228	110.0	3.1	55,353	1,013.4	29.5
1976-77	10,392	385.4	10.2	4,991	148.4	3.7	60,754	1,250.3	36.0
1977-78	10,799	634.4	14.8	5,135	190.5	5.3	66,371	1,694.2	45.6
1978-79	9,839	458.3	10.9	5,380	234.8	6.3	70,843	1,916.4	50.0
1979-80	11,718	602.3	14.4	9,588	325.6	8.5	73,035	2,219.2	56.0
ORDINARY, INDUSTRIAL AND SUPERANNUATION BUSINESS									
1974-75	66,220	913.0	17.3	55,549	308.1	7.1	719,061	4,081.1	89.0
1975-76	63,962	1,088.9	20.3	57,651	374.2	8.6	725,372	4,795.8	100.7
1976-77	63,361	1,282.3	21.2	60,269	511.1	10.3	728,464	5,567.0	111.5
1977-78	62,571	1,641.0	25.6	67,541	629.4	13.0	723,003	6,577.7	124.2
1978-79	60,689	1,596.1	22.5	72,410	706.7	15.6	711,954	7,500.2	131.3
1979-80	59,244	1,845.9	27.0	83,530	1,098.2	19.0	690,332	8,270.5	139.7

## Motor Vehicle Third Party Insurance

Third party insurance in connection with motor vehicle accidents became compulsory on 1 July 1944 under the provisions of the Motor Vehicle (Third Party Insurance) Act of 1943. The Motor Vehicle Insurance Trust was established by an amendment to the Act in 1948 and comprises the general manager of the State Government Insurance Office and four other members nominated by participating approved insurers other than the State Government Insurance Office.

THE MOTOR VEHICLE INSURANCE TRUST  
(\$'000)

Revenue and expenditure	Pool (a) for the year —					
	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Revenue —						
Premiums	14,668	17,226	25,766	27,197	35,118	(b) 51,960
Interest received	2,428	2,909	6,327	5,813	3,968	3,005
Total, Revenue	17,096	20,135	32,093	33,010	39,086	(b) 54,964
Expenditure —						
Claims (c)	21,869	29,623	31,452	45,957	49,383	(d) 49,881
Commission	73	73	76	78	80	85
Management expenses	540	661	710	748	845	920
Taxation	20	23	25	28	31	33
Total, Expenditure	22,501	30,380	32,263	46,811	50,339	(d) 50,919

(a) Figures are revised to 30 June 1980. (b) Inclusive of \$12.59 million unearned premiums. (c) Includes estimate for claims outstanding. (d) Includes an allowance for claims not notified.

The Trust administers a Motor Vehicle Insurance Fund in which approved insurers participate. Premiums received from motor vehicle third party insurance and revenue from other sources constitute annual 'pools' and, after payment of claims and other expenses appropriate to each pool, the resulting profit or loss is shared by the participating insurers, which include the State Government Insurance Office. These shares cannot be finally determined until the last claim is paid and it is usually several years before a pool has satisfied all the claims

attributable to it. For this reason, the figures given in the previous table are subject to progressive revision as the business of each pool approaches finality.

### Health Insurance Organisations

Health insurance is offered by a number of organisations which provide one or more types of benefit covering such items as hospital and medical fees, funeral expenses and sick pay to or on behalf of contributing members and their dependants. They include societies registered under the *Friendly Societies Act 1894-1975* and other organisations registered under the *National Health Act 1953* (Commonwealth).

Benefits are available in a wide range to meet the cost, either wholly or in part, of such services as treatment by a general or specialist medical practitioner (including surgical operations and obstetrical attention), X-ray, cardiographic and pathological examinations, physiotherapy, dental treatment, hospital care, home nursing and ambulance transport. Members of friendly societies may contribute also for the supply of medicines and some societies maintain endowment assurance funds and supplementary death benefit funds.

The following tables give details, for the years 1974-75 to 1979-80, of the membership and the financial activities of friendly societies registered under the *Friendly Societies Act*. 'Benefit' members are those who contribute to the Sick and Funeral Fund of a society and 'other' members are principally those who pay only for medical and hospital benefits.

#### FRIENDLY SOCIETIES — NUMBER, MEMBERS AND SICKNESS BENEFITS

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Registered societies	11	11	11	11	11	10
Branches	236	231	222	219	215	215
Members at end of year —						
Benefit members of sick and funeral funds	13,004	12,534	11,939	11,403	10,955	10,845
Total members (all benefits)	80,788	80,084	74,377	65,067	70,748	70,100
Sickness benefits (a) —						
Number of members paid	1,528	1,377	1,226	1,093	707	76
Number of weeks of sick pay	43,091	30,630	38,624	35,873	21,497	3,117

(a) From 1979-80 only two societies continued to pay sickness benefits.

#### FRIENDLY SOCIETIES — REVENUE AND EXPENDITURE (\$'000)

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Revenue —						
Fees, contributions and levies	6,936	6,177	12,714	14,671	14,066	16,982
Interest, dividends and rent	232	249	265	294	320	381
Other	355	525	788	875	864	1,480
Total, Revenue	7,523	6,951	13,767	15,840	15,250	18,843
Expenditure —						
Sick pay	33	37	35	31	25	2
Medical attendance and medicine	6,307	6,011	10,813	13,915	13,490	16,078
Death benefits	61	58	60	61	74	103
Administration	436	509	649	753	834	960
Other	237	309	578	766	715	766
Total, Expenditure	7,074	6,924	12,135	15,526	15,138	17,909
Balance of funds at end of year	5,451	5,478	7,110	7,424	7,536	8,470

### BUILDING SOCIETIES

Building societies in Western Australia are registered under the provisions of the *Building Societies Act 1976-1978* primarily for the purpose of raising funds to assist members by granting loans, secured on mortgage, to build or acquire homes. They also provide a means of investment for shareholder members, trustee funds and other depositors. The funds of the societies may be in the form of payment for fully-paid shares, subscriptions for contributing

shares, money placed on deposit, or negotiated loans. Another important source of revenue became available to the societies in 1956-57 when, under the *Housing Agreement Act 1956* (Commonwealth), it was provided that moneys should be allocated to approved institutions from Commonwealth Government funds advanced to the States for housing. The current legislation, the *Housing Assistance Act 1978* makes provision for financial assistance to the States for the three years ended 30 June 1981. The Act also provides that the amount of home purchase assistance to be made to the States in respect of the financial year ending 30 June 1981, shall be at least 40 per cent of the total amount of the advances in that financial year. Moneys received by the States under this Act may be made available to home purchasers through Building Societies as well as other lending agencies.

The following table shows particulars of the activities of permanent and terminating building societies registered in Western Australia for the years 1975-76 to 1979-80.

## BUILDING SOCIETIES (a)

Particulars	1975-76	1976-77	1977-78	1978-79	1979-80
PERMANENT SOCIETIES					
Number of societies	10	10	10	10	10
	\$'000	\$'000	\$'000	\$'000	\$'000
Liabilities —					
Withdrawable shares	522,517	646,176	747,307	858,380	966,319
Deposits	286,320	383,451	508,710	681,851	812,817
Loans	25,695	29,525	28,700	31,804	33,365
Other	14,650	19,568	24,218	29,492	36,989
Total, Liabilities	849,182	1,078,720	1,308,935	1,601,527	1,849,490
Assets —					
Amount owing on loans	632,929	851,896	1,046,718	1,270,625	1,491,983
Deposits	162,577	105,022	170,788	209,507	170,132
Bills, bonds and other securities	42,857	43,624	71,962	99,246	162,811
Other	10,819	78,178	19,467	22,149	24,564
Total, Assets	849,182	1,078,720	1,308,935	1,601,527	1,849,490
Expenditure —					
Interest paid and payable	69,617	84,981	108,340	129,819	153,629
Other	11,879	16,317	19,671	23,609	26,606
Total, Expenditure	81,496	101,298	128,011	153,428	180,235
Income —					
Interest received and receivable	81,490	102,802	129,754	155,397	183,081
Other	2,849	3,729	4,409	5,626	7,074
Total, Income	84,339	106,531	134,163	161,023	190,155
TERMINATING SOCIETIES					
Number of societies	521	593	550	534	500
	\$'000	\$'000	\$'000	\$'000	\$'000
Liabilities —					
Loans —					
Banks	n.a.	23,715	26,510	28,527	30,284
Government (b)	46,322	56,292	68,749	79,941	88,784
Other	n.a.	12,073	16,332	17,427	18,852
Other	n.a.	2,949	2,510	2,585	2,854
Total, Liabilities	80,504	95,029	114,101	128,480	140,773
Assets —					
Amount owing on loans (c)	71,568	84,534	102,537	115,597	126,696
Other	8,935	10,495	11,564	12,883	14,078
Total, Assets	80,504	95,029	114,101	128,480	140,773
Expenditure	n.a.	6,217	7,418	8,462	9,438
Income	n.a.	6,540	7,743	8,829	9,790

(a) The financial years shown do not relate to a uniform accounting period, the actual period varying according to the financial year adopted by individual societies. (b) Loans received by societies through the 1973-74 Commonwealth and State Housing Agreement. (c) Net of borrowing members' subscriptions for actuarial societies. Actuarial societies are those in which repayments of an advance are not normally offset against the advance until the sum of total subscriptions plus interest on these subscriptions equals the advance.

The *Building Societies Act 1976-1978* established a Building Societies Advisory Committee of six members, comprising the Registrar of Building Societies as chairman and five other members appointed by the Minister. Of the five members, one shall be the Commissioner for Consumer Affairs or an officer of the Bureau of Consumer Affairs nominated by the Commissioner, three shall be persons each having experience in the conduct and management of a society or societies, and one shall be a person having extensive financial knowledge or experience but who is unconnected with the business of making loans for housing purposes.

The functions of the Committee, as set out in the Act, are to submit recommendations to the Minister for the more effective operation of societies; to make recommendations and submit proposals to the Minister from time to time with respect to regulations and model rules to be made under the Act; to investigate and report to the Minister on such other matters relating to societies and the provision of funds for home finance as may be referred to it by the Minister; to advise the Registrar on any matters referred to it by him; and to perform such other functions as may be prescribed.

### INSTALMENT CREDIT FOR RETAIL SALES

The statistics in the following tables cover all types of instalment credit schemes which relate primarily to the financing of retail sales of goods in which repayment is made by regular predetermined instalments. Types of schemes covered include hire purchase, time payment, budget account and personal loans which relate primarily to the financing of retail sales of goods. In these statistics the term 'retail sales' relates to retail sales by retail establishments coming within the scope of the Censuses of Retail Establishments conducted periodically by the Australian Statistician, Canberra (see Chapter IX, Part 2).

Credit schemes which do not involve repayment by regular predetermined instalments, lay-bys, and all credit transactions which relate mainly to the financing of 'producer' type goods such as plant, machinery and motor vehicles which would normally be used for *commercial* purposes are outside the scope of these statistics. In addition, the instalment credit transactions of businesses covered by these statistics which relate primarily to the financing of sales of land, buildings, property improvements, travel and services such as repair and maintenance work, and schemes involving rental or leasing are not included.

In the following tables, statistics of type of business have been classified according to 'Finance companies' and 'Other businesses'. A definition of the former term is given in the section *Finance Companies*. Most of the businesses included in the category 'Other businesses' are those operating retail establishments which come within the scope of the Census of Retail Establishments and which provide instalment credit for retail sales of consumer commodities. The remaining businesses comprise unincorporated finance businesses, and businesses other than wholesalers and manufacturers, whose financing activities would generally be regarded as ancillary to some other function.

Details of balances outstanding at 30 June for the years 1975 to 1980, according to type of business, are given in the next table.

### INSTALMENT CREDIT FOR RETAIL SALES BALANCES OUTSTANDING (a) (\$ million)

At 30 June —	Type of business		Total
	Finance companies	Other businesses	
1975	162.0	14.9	176.9
1976	199.1	14.5	213.6
1977	255.1	15.3	270.3
1978	301.0	14.5	315.5
1979	316.8	11.9	328.8
1980	308.3	6.9	315.2

(a) Includes hiring charges, interest and insurance.



In interpreting movements in outstanding balances, it should be noted that these movements are determined not only by new amounts financed and cash collections under existing agreements, but also by other liquidations of balances such as rebates allowed for early payouts and bad debts written off.

The amount financed in respect of instalment credit for retail sales of household and personal goods, and vehicles, according to type of credit and type of business during the years 1974-75 to 1979-80 is shown in the next two tables.

**INSTALMENT CREDIT FOR RETAIL SALES — AMOUNT FINANCED  
HOUSEHOLD AND PERSONAL GOODS  
(\$ million)**

Year	Finance companies			Other businesses			All businesses		
	Hire purchase	Other instalment credit	Total	Hire purchase	Other instalment credit	Total	Hire purchase	Other instalment credit	Total
1974-75	6.9	0.2	7.1	13.8	6.3	20.1	20.7	6.5	27.2
1975-76	5.5	8.7	14.3	6.6	14.3	21.0	12.1	23.1	35.2
1976-77	6.4	16.1	22.4	5.5	16.5	22.1	11.9	32.6	44.5
1977-78	5.9	17.6	23.5	5.6	15.8	21.4	11.5	33.3	44.9
1978-79	8.0	17.6	25.6	5.1	14.3	19.4	13.1	31.9	45.0
1979-80	9.2	24.6	33.9	5.1	8.1	13.2	14.3	32.8	47.1

**INSTALMENT CREDIT FOR RETAIL SALES — AMOUNT FINANCED  
MOTOR VEHICLES, ETC.: ALL BUSINESSES  
(\$ million)**

Year	Hire purchase				Other instalment credit				Total hire purchase and other instalment credit
	Cars and station wagons			Total	Cars and station wagons			Total	
	New	Used	Other (a)		New	Used	Other (a)		
1974-75	27.4	37.6	8.9	73.9	3.5	2.0	1.2	6.7	80.5
1975-76	32.4	51.5	14.5	98.4	3.9	3.6	0.9	8.5	106.9
1976-77	36.9	65.0	18.8	120.7	4.5	4.6	0.6	9.7	130.4
1977-78	37.7	73.3	19.4	130.4	4.6	5.6	1.0	11.2	141.6
1978-79	35.3	75.4	16.9	127.5	3.7	6.0	1.4	11.1	138.7
1979-80	31.0	59.6	12.4	103.0	1.7	5.6	1.2	8.5	111.5

(a) Includes new and used motor cycles, boats, caravans, trailers, motor parts and accessories.

### FINANCE COMPANIES

Information relating to the lending operations of finance companies in Western Australia is given in the following tables. A comprehensive account of the scope of the statistics, definitions, and more complete details of the transactions of finance companies are given in the annual bulletin *Finance Companies Assets, Liabilities, Income and Expenditure* and the monthly statement *Finance Companies*, published by the Australian Statistician, Canberra.

For the purpose of these statistics, finance companies are defined as companies which are engaged mainly in providing to the general public (businesses as well as persons in their private capacity) credit facilities of the following types: hire purchase and other instalment credit for retail sales; wholesale finance; other consumer and commercial loans; factoring; leasing of business equipment and plant; and bill of exchange transactions. The finance companies covered in these statistics, in so far as they provide credit for retail sales, are also included in the statistics shown in the preceding section *Instalment Credit for Retail Sales*.

**Amount Financed.** The following table shows the amount financed, according to type of agreement, i.e. instalment credit for retail sales, wholesale finance, personal loans, other consumer and commercial loans, in Western Australia for the years 1974-75 to 1979-80.

**FINANCE COMPANIES**  
**AMOUNT FINANCED: TYPE OF AGREEMENT**  
(\$ million)

Year	Instalment credit for retail sales	Wholesale finance	Personal loans	Other consumer and commercial loans	Total
1974-75	86.3	208.9	6.8	123.8	425.8
1975-76	120.1	307.8	15.4	239.9	683.2
1976-77	151.5	443.7	22.5	315.4	933.1
1977-78	164.8	443.6	31.2	411.6	1,051.3
1978-79	164.3	473.5	37.8	370.8	1,046.3
1979-80	145.3	476.5	44.7	415.9	1,082.4

**Collections and other Liquidations of Balances.** The following table shows the collections and other liquidations of balances, according to type of agreement, i.e. instalment credit for retail sales, wholesale finance, and other consumer and commercial loans, made by finance companies in Western Australia for the years 1974-75 to 1979-80.

**FINANCE COMPANIES**  
**COLLECTIONS AND OTHER LIQUIDATIONS OF BALANCES**  
(\$ million)

Year	Instalment credit for retail sales	Wholesale finance	Personal loans	Other consumer and commercial loans		Total all contracts
				Contracts including charges	Contracts excluding charges	
1974-75	124.0	208.1	9.1	83.3	91.7	516.1
1975-76	142.3	285.4	13.5	119.2	116.0	676.3
1976-77	174.2	397.8	19.0	121.8	159.2	872.0
1977-78	208.8	435.8	29.0	179.5	220.9	1,074.0
1978-79	236.4	475.9	46.3	207.1	205.4	1,171.2
1979-80	239.8	485.6	56.2	210.0	233.2	1,224.8

**Balances Outstanding.** The following table shows the balances outstanding in Western Australia, according to type of agreement, and the total balances outstanding at the end of each year from 1974-75 to 1979-80.

**FINANCE COMPANIES**  
**BALANCES OUTSTANDING: TYPE OF AGREEMENT**  
(\$ million)

Year	Instalment credit for retail sales	Wholesale finance	Personal loans	Other consumer and commercial loans		Total all contracts
				Contracts including charges	Contracts excluding charges	
1974-75	162.0	42.7	13.8	126.2	98.8	443.5
1975-76	199.1	71.0	22.5	166.1	113.5	572.2
1976-77	255.1	130.3	35.9	254.3	159.0	834.5
1977-78	301.0	149.8	51.8	r 314.7	r 164.9	r 982.2
1978-79	316.8	161.3	60.7	r 343.3	r 204.5	r 1,086.7
1979-80	308.3	161.1	70.0	377.0	268.7	1,185.2

**Business Plant and Equipment on Lease.** The following table shows the initial capital cost of business plant and equipment on lease and the balances outstanding in Western Australia at the end of each year from 1974-75 to 1979-80.

**FINANCE COMPANIES  
BUSINESS PLANT AND EQUIPMENT ON LEASE  
(\$ million)**

Year	Initial capital cost of goods newly leased during year	Balances outstanding at end of year
1974-75	36.3	98.4
1975-76	71.0	140.1
1976-77	117.3	223.1
1977-78	169.2	348.4
1978-79	226.6	482.1
1979-80	275.2	624.7

**BANKRUPTCY**

Under the provisions of the *Bankruptcy Act* 1966 (Commonwealth), which is administered by the Minister for Business and Consumer Affairs, the State of Western Australia is a proclaimed Bankruptcy District and the Supreme Court of Western Australia has federal jurisdiction in bankruptcy matters. There is a Registrar in Bankruptcy whose duties include the holding of public sittings for the examination of bankrupts, the examination of witnesses, the issuing of bankruptcy notices and creditors' petitions, and such other duties as are specified in the Act or delegated to him by the Court. Another bankruptcy officer is the Official Receiver, who acts under the general authority and direction of the Court and whose duties relate to the conduct of the debtor and to the realisation and administration of his estate.

The bankruptcy of an estate may result from a petition by either the debtor or the creditors. In cases where it appears certain that the assets of a deceased estate will be insufficient to meet the debts, the executor or a creditor may petition to have the estate administered in bankruptcy.

Compositions, deeds of assignment and deeds of arrangement are provided for in the Act. A debtor may call a meeting of his creditors and either compound with them to pay a certain sum in the \$ as full settlement of his debts or enter into a deed of arrangement allowing him a specified time in which to pay. On the other hand, his creditors may require him to execute a deed of assignment, by which control of his affairs passes to a trustee registered under the Act, or to file a petition in bankruptcy.

The following table relates to bankruptcy proceedings during each of the years from 1974-75 to 1979-80.

**BANKRUPTCY PROCEEDINGS**

Year	Bankruptcies (a)				Compositions, arrangements and assignments without sequestration		
	On petition of —						
	Creditors	Debtors	Assets (\$'000)	Liabilities (\$'000)	Number	Assets (\$'000)	Liabilities (\$'000)
1974-75	22	314	1,508	7,627	71	1,092	2,264
1975-76	20	181	667	2,676	57	1,355	3,209
1976-77	4	176	556	2,491	35	1,447	1,679
1977-78	13	248	1,331	3,634	47	1,904	2,185
1978-79	19	389	1,166	5,908	91	2,344	4,571
1979-80	26	555	2,670	10,228	121	4,685	8,311

(a) Includes orders for administration of deceased persons' estates.

**PUBLIC TRUST OFFICE**

The *Public Trustee Act* 1941-1979 established the Public Trust Office which is administered by the Public Trustee.

## PUBLIC TRUST OFFICE

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Matters accepted for administration —						
Estates of —						
Deceased persons	1,643	1,647	1,536	1,402	1,455	1,413
Mentally incapable persons	149	111	112	89	93	117
Infirm persons	40	57	44	49	54	85
Uncared-for property	—	1	1	—	—	—
Court trusts	143	137	183	128	139	145
Workers' compensation	65	98	72	87	86	101
Agencies	29	19	25	30	35	47
Total	2,069	2,070	1,973	1,785	1,862	1,908
Matters on hand at 30 June	6,532	6,623	6,658	6,431	6,242	6,204
Value of transactions —	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Trust moneys received	14,464	18,010	23,856	29,558	27,800	31,043
Trust moneys paid	12,731	14,924	18,268	22,592	24,264	27,250
Unclaimed moneys paid to Consolidated Revenue Fund	74	70	82	148	91	98
Value of estates and other matters on hand at 30 June	44,858	51,776	67,109	72,247	79,440	88,796

The principal functions of the Public Trustee are the administration of the estates of deceased persons, including intestate estates; the management of the affairs of certain persons rendered incapable by mental illness or other infirmity; and the receipt of moneys under the control or order of the Supreme Court of Western Australia, to be invested and used for the maintenance, education or other benefit of the persons entitled thereto. The Public Trustee receives from the Workers' Compensation Board funds to be held in trust for investment and to be paid out at the direction of the Board. He may also act in the capacity of agent in cases of need.

## OFFICE OF TITLES

The Office of Titles was established under the provisions of the *Transfer of Land Act 1893-1978*. The Act provides for the appointment of a Commissioner of Titles, a Deputy Commissioner of Titles and a Registrar of Titles. The principal functions of the Office are the registration and recording of all instruments and dealings affecting privately-owned land or land alienated from the Crown, the certification and issue of titles to lands, and the maintenance of a register of legal ownership.

The number of documents accepted for registration during the year ended 30 June 1980 was 204,077.

## OFFICE OF TITLES

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Number of registrations —						
Certificates of title —						
Crown grant	3,499	1,744	1,989	1,738	2,056	1,547
Other	23,842	26,060	32,070	32,411	27,361	28,905
Leases —						
Crown	203	310	346	323	463	436
Other	54	46	29	32	40	33
Transfers	45,042	63,618	58,978	55,679	53,400	57,495
Mortgages	34,358	52,070	50,557	52,797	55,485	59,095
Discharges of mortgages	32,441	43,822	42,440	41,409	44,548	47,960
Caveats lodged	7,236	8,766	10,806	11,508	12,066	12,848
Amount of consideration —	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Transfers	634,142	1,097,115	1,200,378	1,526,188	1,737,786	1,959,002
Mortgages	546,335	1,078,364	1,083,270	1,385,635	1,797,147	2,313,716
Fees collected	1,764	3,180	3,448	3,492	3,606	3,925
Expenditure	1,869	2,182	2,489	2,815	2,858	3,317
Assurance Fund —						
Amount of credit at 30 June	336	318	331	356	397	423

## CORPORATE AFFAIRS OFFICE

The Commissioner for Corporate Affairs is responsible, subject to the Minister, for the administration of the *Companies Act 1961-1979*, the *Business Names Act 1962-1976*, the *Associations Incorporation Act 1895-1969* and the *Bills of Sale Act 1899-1973*.

## CORPORATE AFFAIRS OFFICE

Particulars	1975	1976	1977	1978	1979	1980
Number of registrations effected —						
Local companies (a)	1,711	3,440	4,450	2,743	3,191	5,224
Other companies	292	304	392	430	485	506
Business names	20,526	24,378	25,765	29,000	30,760	33,383
Associations	264	238	220	254	246	308
Bills of sale and liens —						
Registrations	69,971	79,320	83,188	84,001	84,803	86,357
Satisfactions entered	683	800	594	701	689	769
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Amount of bills of sale and liens —						
Registrations	294,176	465,303	423,287	480,479	517,453	502,099
Satisfactions entered	7,881	9,361	10,696	17,025	11,758	35,144
Fees collected (b)	1,587	1,914	2,417	2,693	3,261	3,610

(a) Companies incorporated in Western Australia.

(b) Year ended 30 June.

## LOTTERIES AND BETTING

## Lotteries

The Lotteries Commission was established under the provisions of the *Lotteries (Control) Act 1932*. The legislation currently in force is the *Lotteries (Control) Act 1954-1972*. The Commission, as constituted by the Act, consists of four members appointed by the Minister. The principal functions of the Commission are to conduct lotteries and other similar devices in Western Australia to raise money for charitable purposes, and to control lotteries conducted by other persons.

The Act requires that all prizes distributed in lotteries conducted by the Commission shall be cash prizes. It is further provided that the total expenses of conducting lotteries in any year, including commission payable on ticket sales and the remuneration of members of the Commission, shall not exceed 25 per cent of the gross amount received from the sale of tickets.

## LOTTERIES COMMISSION — NUMBER OF CONSULTATIONS AND TICKET SALES

	Type of lottery										
Year	\$25	\$20	\$10	\$7	\$5	\$4	\$3	\$2	\$1	50c	Total
NUMBER OF CONSULTATIONS											
1974-75	—	—	4	—	1	—	—	8	29	102	144
1975-76	2	—	3	—	3	—	—	3	46	101	158
1976-77	1	1	2	1	2	—	1	12	52	97	169
1977-78	—	2	3	—	2	—	1	22	76	48	154
1978-79	—	1	2	—	4	2	—	26	94	—	129
1979-80	—	2	1	—	3	1	—	26	90	—	123
NUMBER OF TICKETS SOLD ('000)											
1974-75	—	—	400	—	100	—	—	800	2,900	10,200	14,400
1975-76	200	—	300	—	300	—	—	300	4,600	10,100	15,800
1976-77	100	100	200	100	200	—	100	1,200	5,200	9,700	16,900
1977-78	—	200	300	—	200	—	100	2,200	7,600	4,800	15,400
1978-79	—	100	200	—	400	200	—	2,600	9,400	—	12,900
1979-80	—	200	100	—	300	100	—	2,600	9,000	—	12,300
RECEIPTS FROM TICKET SALES (\$'000)											
1974-75	—	—	4,000	—	500	—	—	1,600	2,900	5,100	14,100
1975-76	5,000	—	3,000	—	1,500	—	—	600	4,600	5,050	19,750
1976-77	2,500	2,000	2,000	700	1,000	—	300	2,400	5,200	4,850	20,950
1977-78	—	4,000	3,000	—	1,000	—	300	4,400	7,600	2,400	22,700
1978-79	—	2,000	2,000	—	2,000	800	—	5,200	9,400	—	21,400
1979-80	—	3,998	1,000	—	1,500	400	—	5,200	9,000	—	21,098

The Commission is required to pay 20 per cent of all moneys received in respect of lotteries that it conducts into a special account, which is kept at the Treasury in terms of the *Hospital Fund Act 1930-1937*. Moneys remaining to the credit of the Commission after meeting all outgoings authorised by the Act may, with the consent of the Minister, be applied to any approved charitable purpose or in the purchase, improvement or maintenance of lands and buildings for the purposes of the Act.

### LOTTERIES COMMISSION — FINANCIAL TRANSACTIONS (\$'000)

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
GENERAL ACCOUNT						
Receipts —						
Sale of lottery tickets	14,100	19,750	20,950	22,700	21,400	21,098
Lotto subscriptions	—	—	—	—	2,344	7,814
Total	14,100	19,750	20,950	22,700	23,744	28,912
Expenses —						
Prize money	8,672	12,197	12,900	14,026	14,529	17,367
Commission on ticket sales	1,067	1,448	1,542	1,696	1,796	2,202
Salaries and superannuation	238	278	324	349		
Advertising	266	356	371	436	1,583	1,675
Other	147	219	249	245		
Total	10,390	14,497	15,387	16,752	17,908	21,245
Surplus available for distribution	3,710	5,253	5,563	5,948	5,836	7,668
ACCUMULATED FUNDS ACCOUNT						
Balance at beginning of year	474	485	744	1,138	1,115	1,976
Surplus available for distribution	3,710	5,253	5,563	5,948	5,836	7,668
Unclaimed prizes	177	275	290	330	356	435
Rent and interest received	261	297	540	570	566	685
Other	5	32	12	50	r 1,567	48
Total	4,627	6,343	7,149	8,035	r 9,440	10,812
Grants approved	4,123	5,580	5,962	6,375	6,564	7,754
Lotto fund	—	—	—	500	—	—
Prizes paid	14	14	42	44	27	30
Other	4	5	7	1	r 873	35
Total	4,142	5,599	6,011	6,920	r 7,464	7,819
Balance at end of year	485	744	1,138	1,115	r 1,976	2,993
AMOUNT OF GRANTS PAID						
Hospitals and medical and health services	2,780	3,746	5,058	5,044	5,428	5,842
Homes, orphanages and mission centres	442	553	325	621	548	468
Infant health services	11	18	30	24	15	9
Other charitable organisations	517	517	524	663	873	878
Total	3,750	4,835	5,937	6,352	r 6,865	7,197

### Betting

The *Betting Control Act 1954-1978* and the *Totalisator Agency Board Betting Act 1960-1973* provide for the regulation and control of betting and bookmaking on horse racing and greyhound racing in Western Australia.

The Betting Control Act authorises the Totalisator Agency Board to issue licences enabling the holder to carry on the business of bookmaking on a race-course or at registered premises, and betting by or with a person not so licensed is unlawful.

The Totalisator Agency Board Betting Act gives the Totalisator Agency Board authority to regulate and control off-course betting on totalisators through the Board and betting with the Board. The Board consists of eight members, one of whom is the General Manager of the Board. The other seven members are appointed by the Governor and comprise a chairman nominated by the Minister, three persons nominated by The Western Australian Turf Club, and three persons nominated by the Western Australian Trotting Association.

The application of the Act is confined to areas declared by proclamation to be 'totalisator agency regions'. The first agency established by the Board was opened on 18 March 1961. At 31 July 1980 there were 158 agencies in operation.

The Board derives its principal revenues from commission on bets and from a duty of 1½ per cent on the gross takings of every totalisator, as provided by the *Totalisator Duty Act 1905-1973*. The Board may also borrow money, subject to the approval of the Treasurer. The Totalisator Agency Board Betting Act requires that the Board shall pay to The Western Australian Turf Club, the Western Australian Trotting Association and the Greyhound Racing Control Board the funds remaining after meeting all taxes and other specified items of expenditure.

Details of taxes, licence fees and duties payable in connection with horse racing are shown in Part 1 of this Chapter and the amounts collected during the six-year period ended 30 June 1979 appear in the table *State and Local Authorities: Taxation by Type of Tax* also in Part 1.

The following table shows the amounts invested on totalisators on race-courses and through agencies of the Totalisator Agency Board, and amounts invested with licensed bookmakers, during each of the six years 1974-75 to 1979-80.

#### TOTALISATOR INVESTMENTS AND INVESTMENTS WITH LICENSED BOOKMAKERS

Type of investment	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Totalisator investments —						
On course	22,599	28,460	30,893	32,026	36,239	37,479
Off course (a)	120,447	145,191	157,414	177,709	190,245	201,919
Total	143,046	173,651	188,308	209,735	226,484	239,398
Investments with licensed bookmakers —						
On course	60,054	71,160	73,231	91,105	105,711	101,588
Off course	28	23	21	17	—	—
Total	60,082	71,184	73,251	91,123	105,711	101,588
All investments —						
On course	82,653	99,621	104,124	123,131	141,950	139,066
Off course	120,475	145,215	157,435	177,726	190,245	201,919
Total	203,128	244,835	261,559	300,858	332,195	340,985
Per head of mean population	\$ 189	\$ 211	\$ 221	\$ 249	\$ 270	\$ 272

(a) Investments made through agencies of the Totalisator Agency Board.

# THE STOCK EXCHANGE OF PERTH LIMITED

The Stock Exchange of Perth commenced operations in 1889, and conducted business at a number of locations before moving in December 1968 to its present quarters at Exchange House. These premises were designed and constructed to provide adequate space for total post trading which was introduced in July 1967, replacing the call system in which brokers made bids from their desks as stocks were called by a member of the Exchange staff.

The Stock Exchange of Perth was registered as a limited company under the provisions of the Companies Act on 30 June 1971. At that date there were thirty-five members of the Exchange, and at 30 June 1980 there were twenty-nine members.

The following table gives details of turnover during each of the five years 1974-75 to 1979-80.

## THE STOCK EXCHANGE OF PERTH LIMITED TURNOVER OF STOCKS AND SHARES (Figures supplied by The Stock Exchange of Perth Limited)

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
NUMBER OF SHARES TRADED						
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Ordinary —						
Industrial	16,100	21,005	24,122	30,449	36,892	57,424
Oil	6,059	9,542	9,050	12,304	26,166	120,640
Mining	24,341	31,246	42,018	57,750	115,498	300,702
Preference —						
Industrial	50	49	51	90	83	80
Mining	2	17	15	9	3	4
Total	46,553	61,858	75,257	100,602	178,644	478,850
VALUE OF TURNOVER						
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Shares —						
Ordinary —						
Industrial,	12,986	18,690	24,731	46,864	46,468	110,161
Oil	1,686	4,335	3,392	4,640	7,033	50,912
Mining	7,741	11,652	11,912	18,109	46,022	185,938
Preference —						
Industrial	64	74	63	91	114	86
Mining	1	12	10	5	4	17
Total	22,479	34,761	40,108	69,709	99,641	347,114
Commonwealth and semi-government loans	1,038	950	3,301	1,464	8,651	1,013
Debentures, unsecured notes, etc.	668	2,893	3,840	4,914	10,764	2,435
Total	1,706	3,843	7,141	6,378	19,415	3,448
Total value of turnover	24,184	38,604	47,249	76,087	119,056	350,561



## CHAPTER VII — LAND TENURE AND SETTLEMENT, WATER SUPPLY AND SEWERAGE

### PART I — LAND TENURE AND SETTLEMENT

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## **CHAPTER VII**

### **LAND TENURE AND SETTLEMENT, WATER SUPPLY AND SEWERAGE**

#### **Part 1 — Land Tenure and Settlement**

An outline of the origin and development of the land tenure system in Western Australia from the early years of settlement is given Chapter VII of the *Official Year Book of Western Australia*, Nos. 1 and 2 (New Series).

The growth of land settlement in relation to particular agricultural and pastoral activities is dealt with in the relevant sections of Chapter VIII and in the *Statistical Summary* appearing after Chapter X.

#### **LEGISLATION AND ADMINISTRATION**

By the Land Act of 1898, earlier legislation relating to the sale, occupation and management of Crown lands was consolidated and amended. Under a series of Agricultural Lands Purchase Acts which were passed between 1896 and 1904 and consolidated by the *Agricultural Lands Purchase Act 1909*, provision was made for the repurchase by the Crown of land suitable for closer settlement. The principal criteria applied in the purchase of such land were suitability for wheat or mixed farming and proximity to transport, especially the railways.

The operation of subsequent legislation has not greatly changed the pattern of land development which was created by the *Land Act 1898* and the *Agricultural Lands Purchase Act 1909*. The *Land Act 1933-1980* is now the basic statute controlling the leasing and disposal of Crown land. Crown land is also leased under the Mining Act, the Petroleum Act and the Forests Act but no alienations are made under these Acts. In most freehold or leasehold titles of a residential, agricultural or pastoral nature the mineral rights and petroleum rights are reserved to the Crown.

The Department of Lands and Surveys is responsible for the leasing and alienation of Crown land, except where mining and forestry tenures are involved, and is under the control of the Minister for Lands. In certain instances, advisory or partly-executive boards have been created to assist in administration. These include the Land Board, which deals with general applications for land, and the Pastoral Board.

Permits and leases for mining purposes are issued by the Department of Mines and those for forestry and timber milling by the Forests Department.

#### **METHODS OF LAND ALIENATION**

The principal methods of alienation provided for in the *Land Act 1933-1980* are conditional purchase, the sale of town and suburban land by either auction or inviting applications, selection under Part VIII which superseded the Agricultural Lands Purchase Act and reservation for public purposes, including Crown grants in trust for the purpose of the reserve. In addition to these normal methods of alienation there is provision in the Land Act for the release of land under special circumstances where particular development projects are envisaged. In such cases any agreement must be ratified by the State Parliament.

### **Conditional Purchase**

Titles secured by this method originally take the form of conditional purchase leases, on the satisfactory conclusion of which Crown grants may be obtained. The Act provides that a person may not acquire, either as lessee or transferee, an area of land exceeding in the aggregate 2,023 hectares; but on the recommendation of the Minister and with the approval of the Governor, a person may acquire an area of land in one or more parcels exceeding 2,023 hectares, but not in any event exceeding 4,046 hectares, in any case where the Minister is satisfied that a holding requires an area greater than 2,023 hectares in order to be of a standard deemed by the Minister an economic farm unit. The Governor may reduce the maximum area that may be acquired in prescribed localities. The minimum purchase price of land acquired by conditional purchase is forty-nine cents per hectare and the purchaser must pay the costs of survey as well as the value of any improvement. He must progressively clear, cultivate and sow to pasture or crop, areas of land which must aggregate 50 per cent of the total area of the land at the end of the eleventh year.

The maximum period allowed for completion of purchase under an ordinary conditional purchase lease ranges from twenty-five to thirty years, with a possible extension of ten years in certain cases. There is, however, provision for conditional purchase by means of accelerated payments under which a 10 per cent deposit is lodged and the balance of the purchase price paid in four quarterly instalments. The improvement conditions for accelerated-payment leases require the land to be fenced within three years of the commencement of the lease and improvements, equal in value to the purchase money, to be effected within seven years. Unlike the ordinary conditional purchase lease, which cannot be converted to a Crown grant until the expiry of at least five years from the date of commencement, an accelerated-payments type of lease can be converted to a Crown grant at any time after the conditions have been met. Residential conditions, requiring the lessee or a near relative to reside on the property within two years from commencement of the lease and make it his habitual residence during at least six months of each year for the following three years, apply to ordinary conditional purchase leases but are not obligatory under accelerated-payment leases. Restrictions on transfers are imposed in each case.

### **Sale of Town and Suburban Land**

The general conditions governing the sale to the public by auction of town and suburban land are set out in Part IV of the Land Act. Lands may be offered for sale at auction by order of the Minister at such times and places as he may think fit and notice of forthcoming sales must be published in the *Government Gazette of Western Australia* and in a newspaper. Ten per cent of the purchase money must be paid at the time of sale and the balance is payable over a period as stipulated at the time of sale, in any event not exceeding two years. The purchaser is normally required to erect a residence or business premises within a specified period, usually two or four years, from the date of sale. Town or suburban land acquired is held under a licence until such time as the development requirement as specified in the conditions of sale has been fulfilled, after which a grant in fee simple may be issued. In some instances special additional conditions may be imposed. In certain circumstances the Governor may dispense with the requirements as to the sale of town and suburban lands by public auction and may approve of any such land being offered for sale in fee simple or for leasing.

### **Reservation for Public Purposes**

The Governor may dispose of, in any manner which serves the public interest, lands which are vested in the Crown. Crown land is frequently reserved by order of the Governor for a variety of public purposes. Where alienation is ultimately required for certain of such purposes the necessary land is granted in fee simple in trust for the purpose of the reserve. Grounds for reservation include: the general requirements of the Government (e.g. public works and buildings; national parks; conservation of water, timber and indigenous flora and fauna; housing;

public health and social welfare); the use and benefit of the Aboriginal inhabitants; local government needs for such purposes as the provision of town halls and other buildings, public utilities, social amenities, sports grounds and cemeteries; sites for churches, hospitals and other institutions; sites for clubs and club premises; mining and quarrying purposes; public parks; and the provision of camping and watering places for travellers and stock. Reserves may be of class 'A', which by proclamation of the Governor are reservations that must remain dedicated to the purpose declared in their proclamation until by Act of Parliament it is otherwise enacted, or classes 'B' and 'C', which are terminable by the Governor on notice in the *Government Gazette of Western Australia*. In the case of class 'B', however, the Land Act provides that in the event of cancellation, a special report by the Minister shall be presented to Parliament setting out the reasons for such cancellation and the purpose to which it is intended to devote the land. Common uses of class 'A' reserves are for public recreation, national parks, conservation of flora and fauna, for major public buildings, and for areas of particular historical importance. All reserves under Part III of the Act that are not proclaimed as class 'A' are classified as either 'B' or 'C'.

The Land Act provides that, when any reserve is not immediately required for the purpose for which it was made, the Governor may grant a lease for a period not exceeding ten years at such rents and subject to such conditions as he may think fit. Land reserved for parks or recreation grounds may be leased for the depasturing of stock even though the land is being used for the purpose for which it is reserved.

Other methods of alienation comprise mainly reservations of land for housing projects.

#### **State Forests and Timber Reserves**

Special provision is made in the Forests Act for the Governor, by Order in Council, to dedicate Crown land as a State Forest or to reserve Crown land as a Timber Reserve. While the reservation of a Timber Reserve may be revoked in whole or in part by the Governor in Council, following a report of the Conservator of Forests, the dedication of a State Forest may not be revoked except with the consent of both Houses of Parliament. The use of such Forests and Reserves comes within the administration of the Conservator of Forests.

### **METHODS OF LEASING**

Brief reference was made earlier to the work of the Department of Lands and Surveys, the Department of Mines and the Forests Department in granting leases of Crown lands in Western Australia. The activities of each Department in this field are now described in greater detail.

#### **Department of Lands and Surveys**

Approximately 99 per cent of the Crown land held under lease is covered by tenures granted by the Department of Lands and Surveys under the Land Act, and consists mainly of pastoral leases, special leases, leases of reserves and leases of residential and industrial lots. In addition, areas of perpetually-leased farming land have been made available to ex-servicemen under War Service Land Settlement Acts.

**Pastoral Leases.** The *Land Act 1933-1980* provides that the maximum area held under pastoral lease by one person, or by two or more persons jointly, or by any association of persons incorporated shall not exceed 500,000 hectares, and that no person shall become beneficially interested in leases of pastoral land to an extent whereby the aggregate area of pastoral land in which such person is beneficially interested would exceed 500,000 hectares. Where an area of pastoral land is worked in association with another area as one separate and distinct station, the maximum area which may be so worked is 500,000 hectares. The minimum requirement for the grant of a pastoral lease is that the land shall, in the opinion of the Pastoral Board, be capable when fully developed of carrying not less than 6,000 sheep or not less than 1,200 head of cattle.

Pastoral leases are granted for a term expiring on 30 June 2015, and the annual rent payable is determined by the Minister for Lands acting on the advice of the Pastoral Board. Rents are subject to reassessment at statutory intervals. A lessee may, at any time not less than five years nor more than six years after the date on which a reassessment of rent became effective, apply to the Minister to have the rent reviewed by the Board. Provision is made for total or partial relief from payment of rent in respect of any year during which, by drought, cyclone, fire or flood, a lessee suffers serious loss of stock, or wool production is adversely affected.

The holder of a pastoral lease is required to effect improvements of a specified nature and in accordance with a plan approved by the Minister on the advice of the Board. The amount spent on improvements each year must be at least two and a half times the annual rent, and expenditure at this rate must continue until the improvements proposed in the plan have been carried out. A lease is liable to forfeiture if the land is not stocked or kept stocked with such number of sheep or cattle, or both sheep and cattle, as the Board considers appropriate having regard to circumstances such as seasonal conditions affecting the land and the period since the commencement of the lease. Other conditions attaching to pastoral leases provide safeguards against the deterioration of land due to excessive grazing and to the unauthorised ring-barking of trees.

**Special Leases.** Section 116 of the Land Act specifies a variety of industrial and other purposes for which the Governor may grant special leases of Crown land. The yearly rental must be not less than \$4 and the period of the lease must not exceed twenty-one years. It is further provided that, in all cases where the intended period of leasing exceeds ten years, prior notice must be inserted in the *Government Gazette of Western Australia*. Section 116 is modified in certain cases by provisions contained in special Acts to enable the granting of leases for varying terms and conditions for specific projects.

**Leases of Reserves.** As stated earlier in this Chapter in the section *Methods of Land Alienation* the Governor may grant a lease of any reserved land which is not immediately required for the purpose intended at the time of reservation, but the period of the lease may not exceed ten years. By a further provision of the Land Act, no lease for a term exceeding one year shall be granted unless applications are called by notice in the *Government Gazette of Western Australia*. With the consent of the Governor, such land may be sub-leased. When land is reserved for parks or for recreation or amusement, if the land is not placed under the control or management of any person, the Governor may, even though the land is being used for the purpose for which it is reserved, grant a lease or licence for one year for the purpose of depasturing stock. The Governor may insert in the lease or licence such conditions as he may think fit to ensure that the land is available for the purpose for which it is reserved and he may renew any lease or licence for a further period of one year. The *Land Act 1933-1980* also provides that the Governor may direct that the reserve may be leased for the purpose for which it is reserved.

**Leases of Residential Lots.** The Governor may lease any town or suburban lands on such terms as he may think fit, under section 117 of the Land Act. In earlier years, leases of town and suburban lands were offered at public auction and, in most cases, such lessees may apply to purchase the fee simple of the land.

**Perpetual Leases** were authorised under the War Service Land Settlement legislation, which provided that ex-servicemen who had been allotted farms under this joint Commonwealth-State scheme and who met the requirements of the appropriate agreement might enjoy perpetual leases. The lessee, on payment of such purchase price for the fee simple as was fixed by the Minister, might obtain the freehold of the property after the expiration of ten years from the commencement of the term of the perpetual lease or after such shorter period as the Commonwealth and the State determined or might determine where special circumstances existed.

### Department of Mines

Under the provisions of the Mining Act various special tenures, of which gold-mining leases, mineral leases and coal-mining leases are the most important, are granted by the Governor in connection with the mining of gold, coal and other minerals. The Act contains provisions relating to the payment of fees, rents and royalties. The Governor may exempt any person or class of persons from the payment of royalties.

Oil exploration permits and production licences are granted by the Minister for Mines under the provisions of the Petroleum Act and as the Designated Authority under the provisions of the Petroleum (Submerged Lands) Act with authority to charge fees, rents and royalties.

**Gold-mining Leases.** As well as conveying a right to mine for gold to any depth, a gold-mining lease permits the construction of all necessary buildings and plant within the area which it defines. Where, in the opinion of the Minister, land is likely to contain alluvial gold, it is normally exempt from lease. However, a lease not exceeding 19.4 hectares in area may be granted if the Minister is satisfied that the land, having already been worked for alluvial gold has been abandoned, or is suitable for leasing on account of its great depth or excessive wetness, or on account of the costliness of the appliances required for its development. A lease not exceeding 9.7 hectares may also be granted if the Minister considers for any sufficient reason that such land ought not to be exempt from lease. In all other instances the maximum area for a lease is 9.7 hectares. Leases must, where practicable, be rectangular with the length not exceeding twice the width.

The term of any gold-mining lease may not exceed twenty-one years, but has a right of renewal for a further twenty-one years. Its labour conditions provide that for the first year it must be manned by at least two men and for the remainder of its term by at least two men, or one man for every 2.4 hectares, whichever is the greater. Subject to certain adjustments of these labour conditions, a person may hold two or more adjoining leases as an amalgamated group, provided that the group does not total more than 38.8 hectares and that the length along the line of reef or lode does not exceed 1,328 metres. The Minister has discretion, in certain circumstances, to permit the amalgamation of leases which would result in an aggregate area exceeding 38.8 hectares but the length of reef or lode still may not exceed 1,328 metres. A rent of fifty cents per .4047 hectares is charged during the first year and \$2 during the following years. The grant of a gold-mining lease conveys an exclusive right to mine for gold or other minerals within the bounds of the lease, but excludes rights in respect of petroleum.

**Mineral Leases.** Mineral leases authorise the holders to mine for a specified mineral or combination of minerals to any depth within the confines of the lease and convey the same construction rights as a gold-mining lease. The term of any mineral lease shall not exceed twenty-one years, but shall have a right of renewal for a further twenty-one years. Except under special conditions, including the payment of royalty, as set out in the Act, land held under a mineral lease may not be mined for gold. Land which is proved to the satisfaction of the Minister to consist of payable alluvial ground is normally exempted from lease. However, a lease not exceeding 38.8 hectares in area may be granted if the Minister is satisfied that the land, having already been worked as alluvial ground, has been abandoned, or is suitable for leasing on account of its great depth, excessive wetness, or on account of the costliness of the appliances required for its development. A lease not exceeding 121.4 hectares may also be granted if the Minister considers for any sufficient reason that such land ought not to be exempt from lease. In all other cases a mineral lease may not exceed 121.4 hectares and, where practicable, must be rectangular and the length shall not exceed twice the width. The labour conditions provide that a mineral lease must be manned by at least two men for the first twelve months and thereafter by at least one man for every 2.4 hectares or fraction thereof, with a minimum of two men. An annual rent of \$2 per .4047 hectares is charged. Adjoining leases may, by application to the Minister, be amalgamated but the total area may not exceed 242.8 hectares.

**Coal-mining Leases.** Individual leases for coal mining have a maximum area of 129.5 hectares. The term of any coal-mining lease may not exceed twenty-one years, but has a right of renewal for a further twenty-one years. Such leases must be efficiently worked during the first twelve months by at least one man, during the next twelve months by at least two men, and during each succeeding year of the lease by at least three men, for every 24.3 hectares or part thereof contained in the lease. The yearly rent of coal-mining leases is five cents per .4047 hectares and a royalty of 2.5 cents per 1.02 tonnes is payable on all coal raised during the first ten years of the lease, rising to five cents during the remainder of the term. The Mining Act provides for certain royalty rebates on newly-discovered coal deposits while the Mining Regulations contain special provisions regarding development of the deposits in the Collie district, the only area where coal is being mined in the State.

#### **Other Mining Tenements**

**Mineral Claims.** An area not exceeding 121.4 hectares may be applied for as a mineral claim, but the length must not exceed twice the width. The rent for a mineral claim is calculated at the rate of fifty cents per annum per .4047 hectares. Working conditions require that not less than three men shall be continuously employed for every 40.5 hectares or fraction thereof.

**Dredging Claims.** Application may be made for dredging claims for gold or minerals in lakes, swamps, marshes, or rivers and the land adjacent thereto, or on the foreshore of, and land under, the ocean. The maximum area of a dredging claim shall not exceed 121.4 hectares. Except in the case of river claims, where there is no restriction on width, the minimum width at right angles to the bank or shore edge shall not be less than 302 metres. A river claim shall not exceed 9.7 kilometres in length. Working conditions require that not less than three men shall be continuously employed on the claim for every 40.5 hectares or part thereof. In the case of dredging claims that have been amalgamated, provision is made for the continuous employment of machinery and equipment in lieu of employing men.

**Temporary Reserves.** To encourage mining exploration, provision is made for the creation by the Minister of temporary reserves of Crown land and the Minister may also authorise any person to temporarily occupy such reserve on any terms that he thinks fit.

The acceptable maximum area which may be applied for in any one temporary reserve application is — for gold with or without other minerals — 121.4 hectares; for iron ore — 129.5 square kilometres; for other minerals — 200 square kilometres.

The shape of the area shall be as near as practicable to a rectangle with the length not exceeding twice the breadth.

The annual fee required with each application is — for gold with or without other minerals — \$50; for coal only — \$500 plus \$5 per square kilometre (or part thereof); for other minerals — \$1,000 plus \$10 per square kilometre (or part thereof).

Full details of the proposed exploration expenditure and programme, and methods to be used are required before any application for the creation of a temporary reserve can be considered by the Minister. The lowest acceptable annual expenditure commitment on each temporary reserve is — for gold with or without other minerals — \$3,000; for coal only — \$100 per square kilometre (minimum \$10,000 if the area is less than 100 square kilometres); for other minerals — \$200 per square kilometre (minimum \$20,000 if the area is less than 100 square kilometres).

The initial term of any right of occupancy granted is twelve months. Applications for renewal of such occupancy right are not considered unless lodged at least fourteen days prior to the expiry date of any current right of occupancy and accompanied by the requisite annual fee and full details of the proposed exploration programme and expenditure.

In the event of any mineral being found by the holder of an occupancy right granted over a temporary reserve, the holder is required, during the currency of the occupancy right, to peg and apply for mining tenements, before productive mining is commenced.

**Tenures under Special Acts.** Because of the amount of finance involved in large-scale development of iron ore, bauxite, nickel, salt and various other mineral deposits the Government has made special agreements with various companies for the working of such deposits. The agreements are ratified by an Act of Parliament and mineral rights are granted to the lessee to carry out large-scale development and mining operations, subject to the varying obligations including the payment of royalties.

**Tenures under provisions of the Petroleum Act 1967-1972.** This Act came into operation on 5 September 1969 and governs the exploration of and exploitation of the petroleum resources within Western Australia. It is basically similar to the Petroleum (Submerged Lands) Act, the principal tenures available being Permits and Licences.

A permit grants to the holder petroleum exploration rights over an area of up to 200 contiguous blocks (a block is a graticular section being five minutes of arc of latitude by five minutes of arc of longitude) which is valid for a term of five years and renewable for terms of five years over progressively reduced areas. Initially, areas are made available for application as exploration permits by advertisement in the *Government Gazette of Western Australia*. If several applications are received for a particular area, each is evaluated on its individual merits and a decision as to the grant of a permit is made accordingly. Applicants are required to submit details of their proposed exploration work and expenditure for the initial term, together with particulars of their technical qualifications and financial resources. An application fee of \$1,000 is payable. The successful applicant is required to enter into a \$5,000 security for due compliance with the conditions of the permit and observance of the provisions of the Act. Annual rental is payable, calculated at \$5 per block, with \$100 being the minimum rental payable.

Upon the discovery of petroleum within a permit area, a 'location' of up to nine blocks including the discovery block is declared. The establishment of a location is a means of setting aside and identifying a specific number of blocks from which a Production Licence can be selected.

The holder of a permit has two years from the date the location is declared in which to apply for a Production Licence. This period may be extended for a further two years at the discretion of the Minister for Mines.

There is a specific requirement that the licensee shall carry out approved works within the licence area to the value of not less than \$100,000 per block per year. This figure may be offset in subsequent years by the value of petroleum produced in the preceding year. The term of a licence is for twenty-one years with renewal provisions. Annual rental is calculated at \$3,000 per block and a security of \$50,000 may be required.

**Tenures under provisions of the Petroleum (Submerged Lands) Act 1967-1970.** This Act, which came into operation on 1 April 1968, governs the exploration for and exploitation of the petroleum resources of submerged lands adjacent to the Western Australian coast comprising the Continental Shelf and the sea-bed and subsoil beneath territorial waters and is administered by the Minister for Mines as the Designated Authority for and on behalf of the State and the Commonwealth. The principal tenures available under the Act are Permits and Licences.

A permit grants to the holder, petroleum exploration rights over an area of up to 400 contiguous blocks (a block is a graticular section being five minutes of arc of latitude by five minutes of arc of longitude) which is valid for a term of six years and renewable for terms of five years over progressively reduced areas. Initially, areas are made available for application as exploration permits by advertisement in the *Government Gazette of Western Australia*. If



several applications are received for a particular area, each is evaluated on its individual merits and a decision as to the grant of a permit is made accordingly. Applicants are required to submit details of their proposed exploration work and expenditure for the initial term, together with particulars of their technical qualifications and financial resources. An application fee of \$1,000 is payable. The successful applicant is required to enter into a \$5,000 security for due compliance with the conditions of the permit and observance of the provisions of the Act. Annual rental is payable, calculated at \$5 per block, with \$100 being the minimum rental payable.

Upon the discovery of petroleum within a permit area, a 'location' of up to nine blocks including the discovery block is declared. The establishment of a location is a means of setting aside and identifying a specific number of blocks from which a Production Licence can be selected.

The holder of a permit has two years from the date the location is declared in which to apply for a Production Licence. This period may be extended for a further two years at the discretion of the Designated Authority.

There is a specific requirement that the licensee shall carry out approved works within the licence area to the value of not less than \$100,000 per block per year. This figure may be offset in subsequent years by the value of petroleum produced in the preceding year. The term of a licence is for twenty-one years with renewal provisions. Annual rental is calculated at \$3,000 per block and a security of \$50,000 may be required.

**Miscellaneous mining tenures.** The leases and licences detailed above are those which are fundamental to mining development but there are several additional tenures which are issued in order to assist the processes of mineral extraction and treatment. These incidental tenures include rights to conserve and convey water, and to store machinery.

### **Forests Department**

A number of licences, permits and leases are issued under the provisions of the Forests Act.

**Sawmilling.** Permission to cut timber in State Forests and Timber Reserves is authorised by the Conservator of Forests in the form of a Forest Produce (Sawmilling) Licence or a Sawmilling Permit. A Sawmilling Permit entitles the holder to sole cutting rights at a stipulated rate per year in respect of certain classes of timber within a defined area and for a specified period. The Forest Produce (Sawmilling) Licence differs from the Permit in that the licence does not provide for sole cutting rights to the area. In the case of softwood operations the Forests Department organises the supply of pine logs at a set rate per year to the mill landing from State plantations. Log sales are determined initially by tender or auction. Where appropriate resources are available, these licences and permits are normally renewed on an annual basis.

Each licence or permit holder is required to maintain an efficient operation and to supply the Forests Department with details of the logs taken into the mill. With regard to hardwood, a royalty is charged on the quantity of log timber which is delivered to the mill. With softwood operations the licensee is charged a rate for stumpage and cost of delivery of pine logs to the mill.

The Forests Department ensures that cutting programmes are of such a nature that the forest resources are used to the best advantage and that provision is made for forest regeneration. The Department maintains close liaison with the licence and permit holders and in the case of hardwood operations stipulates the areas where the cutting may be undertaken. Licence for woodchip logs is an example where the removal of other than millable timber assists in the process of forest regeneration.

**Other licences, permits and leases.** A number of other licences, permits and leases are issued by the Forests Department.

Forest Produce Licences are issued for the collection of various types of forest produce including fencing material, firewood and mining timber. There are also special provisions for the control of sandalwood operations. Some Forest Leases are granted by the Department for bush grazing and other purposes not opposed to the interests of forestry. These leases may be issued for any term not exceeding twenty years.

Permits are granted for apiary sites of an area not exceeding 1.25 hectares. They are issued to persons who are actively engaged in beekeeping and who have at least twenty-five hives of bees in the State. A permit may not be issued for an apiary site on Crown land if it is within three kilometres of a site already granted to another apiarist, and not more than four permits may be held for every fifty hives of bees owned.

### LAND CLASSIFICATION

Large-scale as well as detailed soil survey measures have been developed progressively in Western Australia since the early days of settlement. Soil mapping of Crown lands in Western Australia has always been carried out as a function of the Department of Lands and Surveys. In the early years of land settlement the staff surveyors, when marking blocks, submitted classifications and commented generally on the probable yield and carrying capacity of the land, as a guide to pricing.

Modern survey techniques enable much use to be made of photogrammetric methods in the mapping and presentation of the soil survey, particularly in definition of vegetation and topographical detail such as rivers, creeks, swamps, hills, valleys, features such as rock outcrops and sand drifts, and the general contours of the land. Much topographical detail is available from the State mapping activities and this information is always used in conjunction with the field work of the soil survey.

The soils are graded into eight categories, to facilitate pricing procedure, due regard being given to the agricultural potential as determined by analysis and experimentation by the Department of Agriculture. This enables release of land in such a manner that each unit is adequate if developed on economic methods. At the same time, the soil maps assist in the overall planning for provision and extension of services such as roads, water and power supplies, townsites and all the services essential to regional development. Pastoral potential appraisements are presented with more emphasis on the grazing potential of natural vegetation in order to assess estimated carrying capacities, rather than detailed soil types.

Mapping and assessment of pastoral areas has been assisted by the use of LANDSAT earth resources satellite data and remote sensing analysis techniques. Applied use of satellite imagery in pastoral and other resource management studies has been co-ordinated through the Office of the Surveyor General.

In addition to the soil and pastoral mapping surveys which are carried out under the direction of the Surveyor General, similar methods are used by other Government Authorities and private organisations, for forestry assessment, classification and control, and for geological mapping.

It has been estimated by the Surveyor General that, of the State's total area of 2,525,500 square kilometres about 11 per cent is taken up by the agricultural areas, 52 per cent by the pastoral regions and the remaining 37 per cent by practically unoccupied areas of the interior. Soil mapping investigations have enabled a broad assessment of the total area and a detailed assessment of the bulk of the agricultural areas and pastoral regions.

### OCCUPATION OF LAND

The following table shows, for a selection of years during the period from 1900 to 1979, the areas of land absolutely alienated or in process of alienation and of Crown land held under certain types of lease or licence. For the years 1900, 1910 and 1920 the basis of classification according

to Department has been made to conform to current practice in the issue of leases and licences. For example, tenures relating to forests, which were originally issued by the Department of Lands and Surveys and later by the Department of Mines, have been shown for those years under the heading of Forests Department. For 1930 and later years the figures are as recorded by the Departments concerned. The types of tenure included under the several departmental headings are indicated in the footnotes to the table.

LAND ALIENATED AND LAND HELD UNDER LEASE  
(‘000 hectares)

At 31 December —	Area absolutely alienated	Area in process of alienation	Area of leases or licences in force on Crown land and issued by —			
			Department of Lands and Surveys		Department of Mines (b)	Forests Department (c)
			Pastoral leases	Other leases (a)		
1900	1.401	1.278	34.977	4	34	345
1910	1.835	5.551	67.203	224	43	522
1920	3.623	5.958	104.420	999	42	664
1930	5.937	8.610	90.693	358	34	539
1940	7.408	5.602	82.875	843	38	954
1950	8.727	4.788	(d) 79.212	1.400	41	1.448
1960	11.158	5.185	88.301	2.685	37	1.617
1970	13.929	5.832	98.982	2.548	49	1.377
1975	15.165	4.340	96.051	2.658	106	1.085
1976	15.504	3.182	96.061	2.653	127	1.212
1977	15.880	2.843	95.501	2.662	117	1.080
1978	16.225	2.554	95.547	2.820	118	r833
1979r	16.519	2.386	93.865	2.233	142	833
1980	16.807	2.151	95.066	2.097	142	833

(a) Comprises special leases, leases of reserves, leases of residential lots and perpetual leases.  
(b) Comprises gold-mining leases, mineral leases and miners' homestead leases. (c) Predominantly sawmilling permits. Includes permits for cutting wandoo for tannin extraction, but excludes permits and licences for cutting timber and firewood in Goldfields areas. (d) Apparent decrease in area due mainly to revision in the records of the Department of Lands and Surveys.

Land which is shown as 'absolutely alienated' consists mainly of farming areas, acquired originally as conditional purchase leases and subsequently alienated under Crown grant. While held under lease prior to alienation they account for most of the land shown as 'in process of alienation'. These two sets of figures taken together consequently give a broad indication of the increased use of land for agricultural purposes during the period under review. Similarly, variations in the area occupied as sheep and cattle stations may be gauged by reference to the area of pastoral leases issued by the Department of Lands and Surveys.

The passing of the Homesteads Act in 1893 and of a comprehensive Land Act in 1898 provided the basis for a rapid increase in the settlement of agricultural land. Under the Homesteads Act, any man over the age of eighteen years who did not already own an area of 40.5 hectares or more in this State could apply for a free homestead farm of 64.7 hectares, on condition that he resided on his land during at least six months of each of the first five years and carried out prescribed improvements. With a lower minimum age of sixteen years, a similar provision is contained in the *Land Act 1933-1980*, and this provision, operating in conjunction with the conditional purchase lease system, has also been a factor in the increase in land settlement, particularly in the wheat-growing areas.

About 1905 the Department of Lands and Surveys, by implementing a system of survey and subdivision before selection, partially checked the indiscriminate selection of land by inexperienced farmers. A further stabilising influence on agricultural development was the introduction in 1909 of a system of grading Crown lands into classes, First, Second and Third according to suitability for farming.

The movement of population from the goldfields to the wheat belt contributed to the increase in the area of land in process of alienation from 1,277,512 hectares in 1900 to 5,550,573 in 1910. The ultimate alienation of about one-third of this land by Crown grant is reflected in the greatly increased figures for 'absolutely alienated' land in 1920. Settlement of the wheat belt developed rapidly during and after the period 1910 to 1920, in spite of serious droughts which occurred in 1911 and 1914. Although the increased totals at 31 December 1930 were principally due to this development, they resulted in part from the acquisition during the previous ten years of farmland, mainly for dairying, in the south-west of the State under the Group Settlement Scheme. These holdings were individually much smaller than those in the wheat-growing districts, because of the type of farming and the heavy clearing costs, but the numbers involved made the total area taken up under the Scheme of some significance.

Pastoral leases, which comprise the greatest proportion of Crown land held under lease or licence, increased threefold between 1900 and 1920. The area actually held under pastoral lease conditions represents approximately one-third of the whole State. The aggregate area of gold-mining leases, mineral leases and miners' homestead leases, appearing in the table under the heading of Department of Mines, shows comparatively little variation since 1900. However, in recent years very large areas have been included in tenures issued under the provisions of the Petroleum Act and in temporary reserves under the Mining Act.

From 1930 the demand for land for agricultural purposes declined considerably, the principal reason being the lower farm commodity prices which prevailed for several years prior to the second World War. After 1945, however, the demand for land again increased, stimulated by the sharp rise in export prices, notably of wheat and wool, and later by the War Service Land Settlement Scheme. The area conditionally alienated in any one year reached a post-war peak of 691,161 hectares in 1953. During the next decade the area fluctuated between 285,657 hectares in 1956 and 499,591 hectares in 1962. The area then declined and by 1972 the area conditionally alienated was only 4,176 hectares, owing to restrictions imposed on the release of Crown land by conditional purchase. There has been a slight recovery in areas alienated in subsequent years but the annual totals have been less than 100,000 hectares.

The following table gives details of areas of land for which applications were approved, during each of the years 1975 to 1980, by the Department of Lands and Surveys for conditional alienation or allocation under lease or licence. The figures shown for any year do not necessarily represent land allotted for the first time, as they may include land previously held under any of the several forms of land tenure.

**CROWN LANDS — AREA OF ALLOCATIONS**  
**APPROVED BY DEPARTMENT OF LANDS AND SURVEYS**  
(Hectares)

Particulars	1975	1976	1977	1978	1979	1980
Conditional alienations —						
Conditional purchase	27,948	33,753	35,138	55,378	89,279	47,278
Town and suburban lots	190	109	126	140	271	205
Miscellaneous (a)	7,840	1,376	1,850	811	859	1,144
Total	35,978	35,238	37,115	56,329	90,409	48,627
Leases and licences —						
Pastoral leases and licences	1,420,213	623,449	297,195	1,004,166	196,350	248,690
Special leases	138,094	23,304	54,942	344,779	14,292	49,887
Miscellaneous leases (b)	29,846	194,198	17,230	14,114	184,555	32,179
Total	1,588,153	840,951	369,368	1,363,059	395,197	330,756

(a) Comprises free homestead farms and reserves.

(b) Comprises perpetual leases, leases of reserves and leases of town and suburban lots.

### GOVERNMENT LAND SETTLEMENT SCHEMES

Although, generally, the method of land alienation and settlement in the agricultural areas of Western Australia has been by independent applications by individual settlers for conditional purchase leases, there has also been a series of government land settlement schemes. The more important of these are the Soldiers' Settlement Scheme following the 1914-18 war, the Group Settlement Scheme introduced in 1921, the War Service Land Settlement Scheme which was initiated in 1945 and other lesser schemes for the settlement of civilians. An outline of each of these schemes appears in Chapter VII of the 1976 issue of the Year Book.

No government land settlement schemes are currently in operation. Activities in respect of the most recent of the schemes, the War Service Land Settlement Scheme, were officially terminated on 31 August 1966 when the main developmental work was completed.

## *Chapter VII—continued*

### **Part 2 — Water Supply and Sewerage**

The principal water supply and sewerage systems of Western Australia are under the control of two State authorities, the Metropolitan Water Supply, Sewerage, and Drainage Board and the Public Works Department.

The Metropolitan Water Supply, Sewerage, and Drainage Board is constituted under the provisions of the *Metropolitan Water Supply, Sewerage, and Drainage Act 1909-1980*. It came into being on 1 July 1964 and replaced the former Metropolitan Water Supply, Sewerage and Drainage Department as the authority responsible, subject to the Minister, for the general administration of the Act. The Board consists of seven members. One member is appointed Chairman on the nomination of the Governor and the remaining members comprise the Commissioner of the Board; a qualified engineer; the Under-Treasurer or an officer of the Treasury nominated by him; and three appointees on the nomination of the Minister, one of whom represents the ratepayers of the City of Perth, the remaining two representing the ratepayers of the balance of municipal districts within the Metropolitan Water, Sewerage and Drainage Area. This area of approximately 5,040 square kilometres constitutes the territory under the Board's administration. It embraces Perth and the metropolitan area southward to Warnbro Beach and Serpentine, northward to Gingin Brook and Herne Hill and eastward to Swan View-Sawyers Valley, Kalamunda, Bickley and Carmel, and also incorporates approximately 2,100 square kilometres of the water catchment areas of the Canning, Serpentine, North Dandalup and South Dandalup Rivers and streams of the Darling Range.

The Public Works Department controls the Goldfields and Agricultural Areas Water Supply and the Great Southern Towns Water Supply as well as 107 local and thirty-four regional water supplies. It also provides water for irrigation purposes in the four South-West Irrigation Districts (Waroona, Harvey, Collie River and Preston Valley), the Camballin Irrigation District and the Ord Irrigation District. In addition, the Carnarvon and Gascoyne Groundwater Supply Scheme supplying about 160 growers in the Carnarvon Non-Artesian Area is being operated.

Five independent town schemes are controlled by local Water Boards in country areas under the *Water Boards Act 1904-1979* and some local authorities supply water under the provisions of the *Local Government Act 1960-1980*. Private companies engaged in mining in the north-west of the State provide their own water supply for mining operations, power supply and domestic use. Individual water supplies serve railways, timber mill towns, isolated mines, pastoral properties, stock routes and agricultural areas, mainly from dams, tanks, wells and bores.

The principal water storages in Western Australia are shown in the next table. Supplies for the metropolitan area and environs are drawn almost entirely from Serpentine Reservoir and Serpentine Pipehead Reservoir, Canning Reservoir, Wungong Dam, Churchman Brook Reservoir, Victoria Reservoir, North Dandalup Pipehead Dam, South Dandalup Reservoir, underground water from the shallow unconfined aquifers of the Gnangara sand beds, and artesian water from the deep confined aquifers. Mundaring Weir, which is the source for the Goldfields and Agricultural Water Supply, is linked to Kalgoorlie by pipeline and serves the more populous parts of the Eastern Goldfields as well as certain towns and farming areas north and south of the main pipeline. As occasion arises Mundaring Weir supplies to or draws from the

Metropolitan Water Supply. Stirling Dam, upstream of the Harvey Weir, is used to augment this weir which is principally used for irrigation but is also used by the Harvey Water Board for domestic use in the town of Harvey. Similarly, Samson Brook Dam is mainly used for irrigation purposes, but water is drawn from a pipehead dam near the town of Waroona for the town water supply. Drakesbrook Dam, Logue Brook Dam, Waroona Dam and Glen Mervyn Dam are used solely for irrigation of areas in the south-west. Wellington Dam, on the Collie River supplies water to the southern part of the irrigation area, as well as towns and farmlands in the Great Southern Towns Water Supply Area and the southern portion of the comprehensive scheme area.

#### DAMS AND RESERVOIRS — STORAGE CAPACITY (a) (<sup>000</sup> cubic metres)

Dam or reservoir	Storage capacity	Dam or reservoir	Storage capacity
Canning Reservoir	93,400	Samson Brook Dam	9,170
Churchman Brook Reservoir	2,160	Serpentine Pipehead Reservoir	(d) 2,637
Drakesbrook Dam	2,290	Serpentine Reservoir	184,880
Fitzroy Dam	4,650	17-Mile Dam (e)	5,490
Glen Mervyn Dam	1,490	South Dandalup Reservoir	208,000
Harvey Weir	9,130	Stirling Dam	57,000
Kununurra Diversion Dam (b)	97,400	Victoria Reservoir	859
Logue Brook Dam	24,300	Waroona Dam	14,900
Mundaring Weir	77,000	Wellington Dam	185,000
North Dandalup Pipehead Dam	(c)	Wungong Dam	60,000
Ord River Dam (Lake Argyle)	5,720,000		

(a) At 30 June 1980. (b) Ord River Diversion Dam. (c) Diversion weir only. (d) Plate removed from crest, decreasing capacity by 1.2 million cubic metres. (e) On Uralla Creek, an anabranch of the Fitzroy River.

#### METROPOLITAN WATER SUPPLY

The sources of the metropolitan water supply are South Dandalup Reservoir, Serpentine Reservoir and Serpentine Pipehead Reservoir, Canning Reservoir, Wungong Dam, Churchman Brook Reservoir, Victoria Reservoir, North Dandalup Pipehead Dam, underground water from the shallow unconfined aquifers of the Gnangara sand beds north of Perth and artesian water from the deep confined aquifers. The supply from these sources is supplemented as necessary from a pipeline link with Mundaring Weir. Underground water used to augment hills supplies amounted to 60,522,100 cubic metres in 1979-80 and represented 42.0 per cent of the total output from all sources, compared with 48,363,400 cubic metres and 40.0 per cent during 1978-79.

#### METROPOLITAN WATER SUPPLY — QUANTITIES OF WATER DRAWN (a) (<sup>000</sup> cubic metres)

Source	1974-75	1975-76	1976-77 (b)	1977-78 (c)	1978-79 (d)	1979-80
Canning Reservoir	53,362	54,813	19,932	4,161	15,008	24,563
Churchman Brook Reservoir	4,679	3,187	1,896	616	2,052	1,889
Mundaring Weir	6,450	4,103	1,290	(e) — 2,908	1,187	1,247
North Dandalup Pipehead Dam	12,215	7,781	4,684	6,464	8,483	5,701
Serpentine Reservoir (f)	65,674	67,281	73,324	15,235	30,508	32,068
South Dandalup Reservoir	10,043	16,430	33,432	29,228	10,300	16,226
Victoria Reservoir	3,130	3,669	1,361	1,528	1,942	578
Wungong Dam	6,139	7,249	2,820	1,765	2,933	—
Metropolitan bores (g)	21,157	31,017	36,714	52,850	48,363	60,522
Total	182,849	195,530	175,453	108,939	120,778	142,797

(a) Including supplies to railways and shipping. (b) Decreased quantities drawn mainly as a result of a publicity campaign to save water. (c) Water restrictions in force from July 1977. (d) Water restrictions eased. (e) Amount of water pumped into Mundaring Weir in excess of draw. (f) Includes water drawn from Serpentine Pipehead Reservoir. (g) Includes shallow underground water.

Victoria Reservoir, which was completed in 1891 with a capacity of 859,000 cubic metres, was the first of the existing water conservation projects to be completed in the Darling Range. In 1921 a 104,500 cubic metre reservoir, which is no longer used for water supply, was

constructed at Bickley Brook to replace a pipehead dam, and in 1928 one with a capacity of 2,182,000 cubic metres was completed at Churchman Brook. During the same period pipehead dams were built across the upper course of the Canning River and its tributary, Wungong Brook, preliminary to the construction of Canning Reservoir, which was begun in 1933 and completed in 1940. Canning Reservoir has a storage capacity of 93,420,000 cubic metres retained by a concrete wall 66 metres high and 468 metres long at the crest. Serpentine Pipehead Reservoir was completed in 1957 and Serpentine Reservoir, commenced in 1957, was completed in 1961. Serpentine Reservoir is constructed of rolled earth fill and the embankment rises 52 metres above the stream bed, the length at the crest being 424 metres. Its capacity, which is slightly less than that of Wellington Dam on the Collie River, is 184,882,000 cubic metres. Supplies to the metropolitan system are augmented by the North Dandalup Pipehead Dam which is the first stage of the Dandalup Rivers Scheme and was completed in December 1970. The major storage component of the scheme, the 208,211,000 cubic metre capacity South Dandalup Dam, was completed in late 1973.

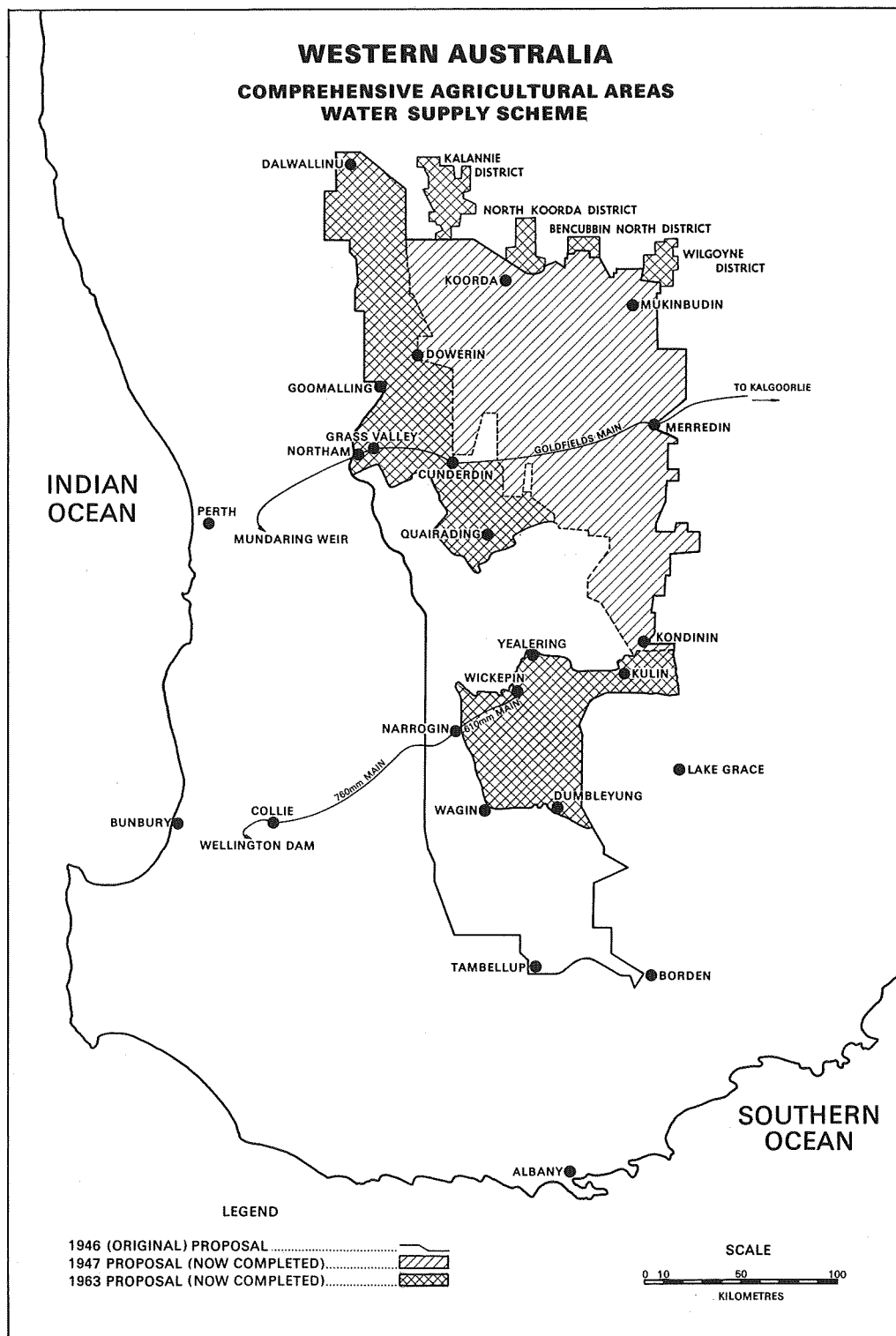
Water from storages in the Darling Range is conveyed to the metropolitan area by the Canning Tunnel, which was commissioned on 17 January 1975, and large trunk mains. It is then distributed by feeder, distribution and reticulation mains, either directly from the trunk main or from large storage service reservoirs at Mount Yokine, Mount Eliza, Bold Park, Mount Hawthorn, Richmond, Melville, Buckland Hill, Hamilton Hill, Thompson Lake, Greenmount, Mirrabooka, Wanneroo and Whitfords and from summit tanks and water towers situated at high points throughout the area supplied. The Canning Tunnel is an important addition to the trunk main system and is designed to cope with the maximum flow requirement envisaged from Canning Dam to Roleystone. In addition, groundwater from shallow confined and unconfined aquifers of the Gnangara Mound is distributed, after treatment, into the supply system. The groundwater is treated at water treatment plants situated at Gwelup, Mirrabooka, Wanneroo and Jandakot which have the capacity to produce 225,000 cubic metres of clear water daily. To meet the peak demand during the summer months, supplies from these sources are supplemented from a system of artesian bores which can provide a daily maximum of 95,500 cubic metres. At 30 June 1980 the number of consumer services was 289,000.

## COUNTRY WATER SUPPLIES

### **Supplies controlled by the Public Works Department**

Since 1947 enlargement and extension of the Goldfields and Agricultural Areas Water Supply and the development of the Great Southern Towns Water Supply have been carried out mainly in accordance with a project known as the Modified Comprehensive Scheme. A proposal for a comprehensive water supply scheme was first submitted by the State Government to the Commonwealth Government in January 1946 when applying for financial assistance in its construction. The initial plan was intended to supply water to towns and farms in an area of 4.7 million hectares in mixed farming (cereal and sheep) districts of Western Australia, as well as to increase the supply to the Eastern Goldfields. A committee appointed by the Commonwealth Government to consider the State's submission reported that certain areas within the scheme had a higher priority than others. As a result, the project was greatly reduced in scope and a modified scheme, to embrace 1.7 million hectares, was agreed to by both Governments and adopted in October 1947. The extent of the scheme as originally proposed, and as modified, is shown on the following map. A description of the boundary of the modified scheme is contained in a schedule to the *Agricultural Areas, Great Southern Towns, and Goldfields Water Supply Act 1947* (State), which gave parliamentary approval of the undertaking. Commonwealth financial aid was provided by means of the *Western Australia Grant (Water Supply) Act 1948* (Commonwealth) and later amendments, which authorised reimbursement to the State of one-half of its expenditure on the scheme, up to a maximum grant of \$10 million.





The modified scheme was completed in 1961, the total expenditure amounting to \$20.6 million. A request made by the State Government in 1960 for a grant equal to half the cost of extending the scheme virtually to the boundary as first proposed in 1946 was rejected by the Commonwealth Government. Following this rejection the State Government embarked on a necessarily limited programme financed from its own loan moneys, the policy being to restrict extensions to supply certain towns within the original area and farm lands adjacent to pipelines. A further request was made by the State Government in 1963 for a grant of \$10.5 million payable over a seven-year period and representing one-half of the estimated cost of proposed extensions which would increase by 1.5 million hectares the area served by the scheme. The Commonwealth Government agreed to provide assistance in the form of an interest-bearing loan up to a maximum of \$10.5 million, advances to be made during a period of eight years commencing with the financial year 1965-66. Legislative authority for the loan was given by the *Western Australia (South-west Region Water Supplies) Agreement Act 1965* (Commonwealth).

### Goldfields and Agricultural Areas Water Supply

The original purpose of this undertaking, which was formerly known as the Goldfields Water Supply was to supply water for the Coolgardie and the Kalgoorlie-Boulder areas. To provide conservation, the Helena River was dammed near Mundaring, and on completion of the reservoir in 1902 it had a capacity of 21 million cubic metres. The increasing demand for water in the area served made it necessary to augment supplies. This was achieved by raising the wall 9.8 metres to a height of 40.2 metres and when the work was completed in 1951 the enlarged capacity of the reservoir was 68.9 million cubic metres. The capacity has since been further increased to 77.0 million cubic metres by the erection of adjustable steel crest gates 1.2 metres in height. In 1972 the Lower Helena Pipehead Dam, some eight kilometres below Mundaring Weir, was brought into operation, water being pumped from this source to augment the supply from Mundaring reservoir. The main pipeline between Mundaring and Kalgoorlie is 554 kilometres long. It is for the most part 762 millimetre diameter steel but has 1,219 millimetre, 1,067 millimetre and 914 millimetre pipe in the western portion with some duplication of the 762 and 914 millimetre pipe. There are sixteen pumping stations along the main pipeline. The maximum pumping capacity from Mundaring Weir is 134,000 cubic metres per day. The total capacity of all receiving, regulating, standby and service tanks (including four standby reservoirs at Kalgoorlie with a combined capacity of 336,000 cubic metres) is 1.2 million cubic metres.

At 30 June 1980 the Goldfields and Agricultural Areas Water Supply was serving 112 towns and localities and water was being reticulated to farms in an area of 2.65 million hectares.

### GOLDFIELDS AND AGRICULTURAL AREAS WATER SUPPLY

Year	Number of services	Length of water mains (kilometres)	Consumption (a) ('000 cubic metres)						Total
			Domestic	Commercial	Industrial (including railways)	Mining	Farms and market gardens	Other	
1974-75	27,157	8,150	6,134	869	938	3,852	4,443	2,315	18,551
1975-76	27,942	7,940	6,438	930	1,100	3,986	4,955	2,488	19,897
1976-77	28,094	7,932	6,977	1,034	1,077	1,102	5,137	5,002	20,329
1977-78	27,853	8,022	4,359	746	771	1,102	3,753	4,255	14,986
1978-79	28,600	8,035	5,151	785	834	1,548	3,996	3,578	15,892
1979-80	28,889	8,052	6,380	847	712	1,344	4,989	3,875	18,147

(a) Figures include amounts consumed from local supplies at Waddouring-Barbalin-Knungajin, Bruce Rock, Naremben and Kondinin.

Extensions to country towns and agricultural areas have been made from several points along the main pipeline. Norseman is connected by an extension southward from Coolgardie. A branch from this main supplies the nickel mining town of Kambalda. From two points west of Merredin water is taken northward to supplement local schemes at

Waddouring-Barbalin-Knungajin. Other extensions north and south of the main pipeline provide water for a number of towns and surrounding districts, including Toodyay, Goomalling, York, Beverley and Bullfinch. A pipeline southward from Merredin to serve Bruce Rock, Narembene, Kondinin, Corrigin and surrounding districts is linked to an extension south from Doodlakine. A main south from Cunderdin serves Quairading and the intermediate farmlands. Areas north-west of Burracoppin are served by an extension northward from a point east of Merredin, and districts north of Kellerberrin by a pipeline connecting Kellerberrin to the Waddouring-Barbalin-Knungajin system already mentioned. Water is taken northward from Cunderdin through Minnivale to a point near Kokardine. Extensions westward, eastward and northward from this pipeline serve a number of towns and localities, including Dowerin, Wyalkatchem, Yelbeni, Koorda, Kalannie, Pithara, Ballidu, Dalwallinu, Wubin and Wongan Hills, and surrounding farmlands. From a point on the main pipeline east of Southern Cross an extension northward serves Koolyanobbing, where iron ore is mined, while an extension southward serves Marvel Loch and adjacent farmlands.

### Great Southern Towns Water Supply

The Great Southern Towns Water Supply serves towns on the Great Southern Railway from Brookton to Katanning, as well as a number of other towns. Water is drawn from Wellington Dam which also supplies the Collie River Irrigation District. Work on raising the wall of the dam to give it a holding capacity of some 185 million cubic metres was completed in 1960. Water is taken through Narrogin to Wickepin by means of a main pipeline 171 kilometres long. In addition to the pumping installation at the dam site, there are stations at a point forty-five kilometres east of the dam and at Narrogin. From Narrogin, pipelines extend sixty-four kilometres northward to Brookton, ninety-five kilometres southward to Katanning and eastward to Wickepin and Kulin. Branch lines from this latter line extend northwards to take in the towns of Yealering, Bullaring and Kondinin and southwards to Dumbleyung, Moulyinning, Dudinin, Harrismith and Lake Grace. A branch westward from Katanning serves the town of Kojonup and a second branch extends south-eastward through Broomehill to Gnowangerup. A pipeline eighteen kilometres long supplies water to a power station constructed for the State Energy Commission at Muja, south-eastward from Collie.

At 30 June 1980 the Great Southern Towns Water Supply was serving thirty-five towns and an area comprising 607,000 hectares of farmland. Details of the number of services, length of water mains and consumption for the years 1974-75 to 1979-80 are given in the following table.

GREAT SOUTHERN TOWNS WATER SUPPLY

Year	Number of services	Length of water mains (kilometres)	Consumption ('000 cubic metres)					Total
			Domestic	Commercial	Industrial (including railways)	Farms and market gardens	Other (a)	
1974-75	10,907	1,916	2,584	290	881	743	496	4,993
1975-76	11,191	1,918	2,448	263	802	791	475	4,778
1976-77	11,384	1,923	2,743	262	597	1,671	543	5,816
1977-78	11,477	1,968	2,667	280	483	927	553	4,910
1978-79	11,630	1,977	2,606	261	487	927	429	4,710
1979-80	12,167	2,136	2,785	290	507	976	648	5,206

(a) Excludes mining, for which no services were provided by the Public Works Department.

### Supplies to other Country Towns

One hundred and forty-four towns and localities are supplied with water from stream flow, dams, tanks, wells and bores, the schemes being administered under the provisions of the *Country Areas Water Supply Act 1947-1980*.

The Public Works Department is also responsible for the provision and maintenance of tanks and wells as a source of cartage water for a number of small communities in gold mining and agricultural areas.

#### PUBLIC WORKS DEPARTMENT: LOCAL SCHEMES

Year	Number of services	Length of water mains (kilometres)	Consumption ('000 cubic metres)						Total
			Domestic	Commercial	Industrial (including railways)	Mining	Farms and market gardens	Other	
1974-75	41,639	2,659	15,442	3,784	2,965	167	369	9,452	32,179
1975-76	43,387	2,717	15,675	4,529	2,964	237	319	10,863	34,587
1976-77	45,739	2,832	17,344	4,059	2,837	218	294	14,124	38,876
1977-78	48,132	3,043	17,543	4,870	1,632	270	349	13,311	37,975
1978-79	51,425	3,100	18,463	4,460	2,664	197	329	13,032	39,145
1979-80	54,171	3,348	20,032	4,420	2,873	317	411	13,620	41,673

#### Other Country Water Supplies

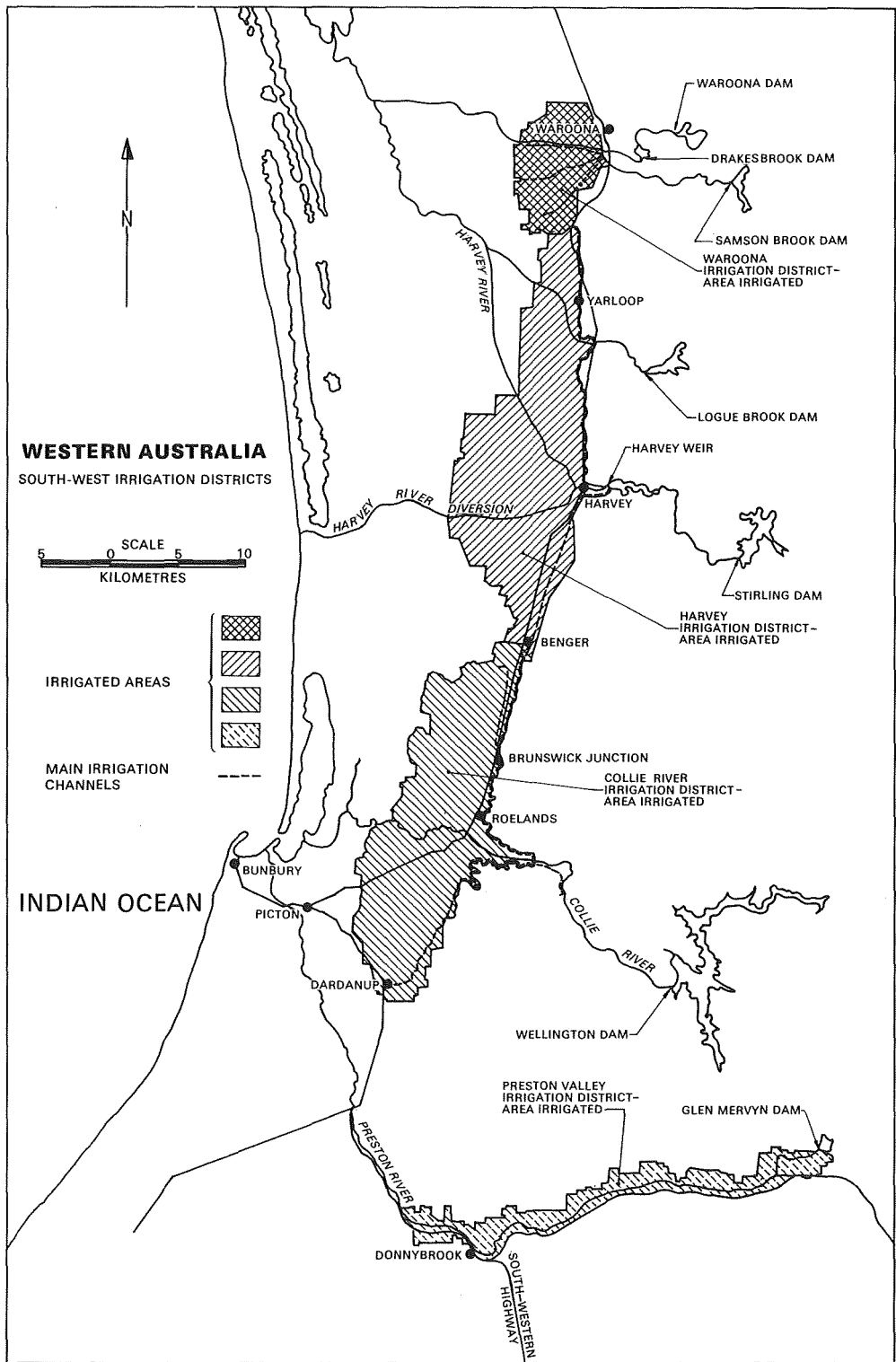
As well as the schemes controlled by the Public Works Department, there are five local Water Boards operating under the *Water Boards Act 1904-1979* which also draw supplies from stream flow, dams, tanks, wells and bores. In addition, some local authorities exercise powers under the *Local Government Act 1960-1980* to supply water within their boundaries. There are still, however, a large number of individual farms and pastoral stations which are not connected to public schemes and are therefore obliged to provide their own supplies. The Forests Department and sawmilling companies operate schemes to supply water to their mill towns. In a number of ports and mining towns in the north-west of the State, mining companies are responsible for the provision of their own water supplies, and while the principal source of supply is underground reserves, desalination of sea water is also being used.

The use of water by railways of the Commonwealth Government and State Government has decreased with the replacement of steam locomotives by diesel. The majority of the former railway dams have been handed over to the Public Works Department and have been incorporated into the various schemes for use as town water supplies, farmland reticulation and agricultural water carting sources. Water consumed by the railways is obtained from supplies controlled by the Metropolitan Water Supply, Sewerage, and Drainage Board and the Public Works Department.

Numerous rivers and river systems throughout the State have been proclaimed by the Governor in Council vesting in the Crown the right to use and control surface water. The proclamation confirms the entitlement of riparian landowners to divert water for stock and domestic requirements, and provides the power for the Government to control stream diversions by licence. Currently the licensing is restricted to those pumping from rivers downstream of major water supply storages and those areas where there have been numerous disputes involving a number of landowners.

#### UNDERGROUND WATER

Considerable use is made of groundwater by individual farmers, pastoralists, market gardeners, etc. and it is estimated that over 92,000 bores are in use in the State. The quality of the water varies from place to place and much of it is too saline for irrigation or even stock. Both pressure waters and non-pressure waters are used to supply or augment the supplies of numerous towns, including such major centres as Perth, Albany, Bunbury, Busselton, Carnarvon, Dampier, Esperance, Exmouth, Geraldton, Karratha and Port Hedland, and the list is growing. In a number of ports and mining towns in the North West (e.g. Paraburdoo, Tom Price and Newman) mining companies are responsible for the provision of their own water supplies.



Industries also are using groundwater in substantial quantities, particularly in the processing of titanium, iron, and alumina. Recent mineral discoveries in several areas have given rise to very large demands for water, the search for which has had to be intensified. Marked advances in the knowledge of aquifers and quality of water in the main sedimentary basins have been made as a result of extensive geological surveys and exploratory drilling by the Geological Survey (a branch of the Department of Mines), several oil companies, the Public Works Department and the Metropolitan Water Supply, Sewerage, and Drainage Board.

Under the *Rights in Water and Irrigation Act 1914-1978* a licence is required for an artesian bore anywhere within the State, and for any non-artesian bore within a Proclaimed Area. Currently there are twenty-four proclaimed groundwater areas between Esperance and Camballin. In general, licensing has been introduced in order to ensure the overall orderly development of certain areas, to protect town water supplies dependent on groundwater resources, and to secure domestic and stock water supply requirements while catering to the extent possible for the integrated industrial, agricultural, recreational and environmental needs of the region.

The Public Works Department and the Metropolitan Water Supply, Sewerage, and Drainage Board are responsible for all developmental works and exploration for their own supplies. The Geological Survey is responsible for exploratory work, as well as for investigating and assessing the State's groundwater resources, and advising local government authorities, private industry and individuals on groundwater problems.

### SOUTH-WEST IRRIGATION SCHEMES

Irrigation schemes have been established by the State Government on the coastal plain south of Perth in the Waroona, Harvey, Collie River and Preston Valley Irrigation Districts between Waroona and Donnybrook, the water being channelled from dams in the adjacent Darling Range. The areas irrigated and main irrigation channels in each Irrigation District at 30 June 1980 are shown on the preceding map, together with the relevant dams.

Specialist advice on irrigation farming methods is available through the Department of Agriculture and the properties are watered according to requirements.

The Harvey Irrigation District, opened in 1916, was the first large-scale project. Harvey Weir, with a capacity of 2.36 million cubic metres on completion, was constructed as the source of water supply and the service initially provided was for 1,215 hectares of land for citrus growing.

The success of dairying and stock raising and to a lesser extent vegetable growing, which have replaced citrus culture, has led to gradual but substantial extensions of the south-west irrigation area. The damming of Drakes Brook in 1931 and Samson Brook in 1941 provided a storage capacity of 10.37 million cubic metres which, by alterations to Samson Brook Dam in 1960, has been increased to 11.46 million cubic metres and is used for the irrigation of 1,515 rated hectares in the Waroona Irrigation District. In 1966 a third storage to serve the Waroona District, known as Waroona Dam, was completed on Drakes Brook about five kilometres up-stream from the existing Drakesbrook Dam. Its capacity is 14.90 million cubic metres. In 1931 the capacity of Harvey Weir was enlarged to 9.13 million cubic metres (including flashboard storage) and in 1948 Stirling Dam, with an original capacity of 54.83 million cubic metres (increased to 57.00 million cubic metres by alterations in 1958), was completed further up-stream on the Harvey River. These works enabled the Harvey Irrigation District to be extended northward to link with the Waroona District. Logue Brook Dam, with a capacity of 24.30 million cubic metres, was completed in 1963 and provides additional supplies for the Harvey Irrigation District, the rated area of which is 5,584 hectares.

Details of irrigation in each district in the years 1978-79 and 1979-80 are given in the accompanying table. Similar information relating to northern irrigation schemes embracing the Ord and Camballin Irrigation Districts appears later in this Part.

#### IRRIGATION: SOUTH-WEST SCHEMES

Particulars		Irrigation district (a)									
		Waroona		Harvey		Collie River		Preston Valley		Total	
		1978-79	1979-80	1978-79	1979-80	1978-79	1979-80	1978-79	1979-80	1978-79	1979-80
Area watered	hectares	1,769	1,731	5,804	5,475	6,434	5,464	396	505	14,403	13,175
Pasture	"	1,144	1,052	4,230	5,306	4,269	5,436	3	3	9,646	11,797
Fodder crops	"	95	132	385	62	50	23	—	—	530	217
Potatoes	"	—	—	31	5	4	—	46	62	81	67
Other vegetables	"	88	80	320	26	17	3	14	4	439	113
Orchards	"	—	—	568	76	—	2	333	439	901	517
Hectare waterings (b)		10,595	9,796	37,414	27,413	46,772	35,694	1,553	1,688	96,334	74,591
Average number of waterings (c)		6.0	5.7	6.4	5.0	7.3	6.5	3.9	3.3	6.7	5.7
Total water gauged at entry to district	'000 cu m	14,023	13,590	52,070	39,874	68,103	51,926	1,016	802	135,212	106,192
Dam capacity (d)	"	26,360	26,360	90,430	90,430	185,000	185,000	1,490	1,490	303,280	303,280
Length of channels	km	76	76	285	285	267	267	..	..	628	628

(a) See map: South-West Irrigation Districts. (b) Area watered multiplied by number of waterings. Figures are the sum of hectare waterings for individual holdings in each district. (c) Total hectare waterings divided by total area watered. (d) Includes flashboard storage.

During 1969 construction of the Glen Mervyn Dam on a tributary of the Preston River near Mumballup was completed. Water from this dam is made available each summer for controlled release into the Preston River when the natural stream flow is insufficient for the irrigation of orchards downstream from Donnybrook.

Concurrently with developments in the Harvey and Waroona Irrigation Districts, action was taken to conserve water for the Collie River Irrigation District and Wellington Dam on the Collie River was completed in 1933. In view of its importance, not only to irrigation projects but also to the Great Southern Towns Water Supply, the wall of this reservoir has been raised and when work was completed in 1960 its capacity of 36.37 million cubic metres was increased to 185 million cubic metres. It serves an area of 4,946 rated hectares in the Collie River Irrigation District, which extends from Brunswick Junction to Dardanup.

#### NORTHERN IRRIGATION SCHEMES

**Carnarvon.** A thriving plantation industry has developed at Carnarvon which is situated near the mouth of the Gascoyne River. This centre is one of the major producers in Western Australia of tomatoes, watermelons, pumpkins, cucumbers, capsicums and runner beans. Carnarvon also exports capsicums, zucchinis and pumpkins to the Eastern States. It produces over half the bananas consumed in Western Australia as well as limited supplies of citrus fruit, mangoes and avocados.

The rainfall at Carnarvon is extremely variable and averages little more than 230 millimetres per annum. Agricultural development has been made possible only by irrigation. Water is obtained from the growers' own irrigation plants and from the Government-controlled Carnarvon Groundwater Supply Scheme which is supplied from bores along the Gascoyne River extending between points twenty kilometres and fifty-two kilometres upstream from the mouth of the river. More than 60 per cent of water used for irrigation is now supplied from this Scheme. Usually the river bed is exposed as surface flows of the Gascoyne River do not occur regularly each year. Wells and bores are sunk into the river sands and the water obtained is pumped either into storage tanks or direct to plantation channels and pipes from which it is distributed to plants by bays or furrows. Limitation of supply from the river sands has led to the State Government instituting control over the quantity and quality of water pumped, and the up-river sources have been developed to bring additional supplies of water into the irrigation area.

The Gascoyne Research Station is maintained at Carnarvon by the Department of Agriculture. Early activities of this research station have contributed to the success of the Carnarvon plantations particularly in the fields of plant selection and pest control. More recently, emphasis has been placed on the introduction of new varieties of avocados, pineapples, mangoes, bananas and citrus fruit, as well as new vegetable varieties and techniques for improving irrigation.

**Ord River.** The Ord River in the Kimberley Division traverses a tropical area which receives monsoonal rains of irregular incidence and quantity, varying from an annual mean of 510 millimetres in the south to 760 millimetres in the north. Investigations at the Kimberley Research Station, established in 1945 and operated until 1975 by the Department of Agriculture in conjunction with the Commonwealth Scientific and Industrial Research Organization, showed that the climate and soil conditions are favourable for the cultivation of sorghum, sugar-cane, rice, cotton, safflower and various oil seeds. Following these investigations the State Government, with Commonwealth Government financial assistance, embarked on a project to provide water supplies for irrigation in the area.

The Ord Irrigation Project provides for the development of 72,000 hectares of land agriculturally and topographically suitable for irrigation. The project comprises four stages: the first was the construction of a diversion dam to supply water for an area of 12,100 hectares and the second, the building of a main storage dam with a capacity of 5,720 million cubic metres. The other stages are the progressive development of the whole 72,000 hectares and the construction of a hydro-electric power station.

The Kununurra Diversion Dam, situated at Bandicoot Bar about 105 kilometres by road south-east of Wyndham and forty-eight kilometres downstream from where the Ord River Dam now stands, was officially opened on 20 July 1963. The capacity of the diversion dam is 97.4 million cubic metres and irrigation from the dam commenced in April 1963. Its storage is named Lake Kununurra.

There are thirty-five farms developed, thirty in the first stage on Ivanhoe Plain averaging 270 hectares each and five in the second stage on Packsaddle Plain averaging 373 hectares each. Prior to 1975 cotton was the main crop. However, owing to high off-farm costs, high costs of insecticides and a decrease in the return for cotton no commercial crops have been planted since 1974. Lower meat prices have also led to reduced areas of grain sorghum and fodder crops being grown for fattening of cattle. Trial crops of peanuts are being grown and a pilot processing plant has been established. Rice is grown and processed for the Western Australian market. Crops of sunflower, oats, barley, maize and safflower are also being grown. The prospects for a sugar industry in the area are being investigated and a detailed feasibility study has been undertaken by a major Australian sugar company using the expertise of various bodies in the Queensland sugar industry. A pilot sugar farm is now established.

The original pilot farm for the Ord Irrigation Project, an area of 970 hectares developed by a private company to conduct farm-scale trials under an agreement with the State Government, later became the company's property under the agreement.

The relocation and upgrading of the one-tonne per hour pilot rice mill to a two-tonne per hour commercial mill was completed during 1979, utilising the buildings previously used for cotton ginneries. Rice storage facilities now comprise eight silos of a total capacity of 3,600 tonnes of paddy rice.

The diversion dam was recognised by the Commonwealth Government in August 1959 as an approved project within the meaning of the *Western Australia Grant (Northern Development) Act 1958* (Commonwealth). This legislation provided for payment by the Commonwealth



Government to the State Government of a non-repayable grant of \$10 million for development of the part of the State north of 20°S latitude. Of this grant \$8.2 million was spent on the diversion dam. In February 1963 a further approach was made to the Commonwealth Government requesting an amount of \$3.3 million for the completion of channels and drains required to develop the whole of the 12,100 hectares included in the first stage of the project. The request was approved in August 1963 and moneys made available by way of grant in terms of the *Western Australia (Northern Development) Agreement Act 1963*.

In November 1967, the Commonwealth Government approved the plan for the second phase of the Ord River Irrigation Scheme and agreed to provide financial assistance to the State for the works involved. Agreement as to the terms and conditions for financing the second phase of the scheme was announced in March 1968. In terms of the *Western Australia Agreement (Ord River Irrigation) Act 1968* the Commonwealth Government agreed to provide financial assistance to the State in an amount equivalent to expenditure on the works, up to a maximum of \$48.18 million. The assistance took the form of a non-repayable grant for the construction of the main Ord dam (\$21.80 million) and an interest-bearing loan for the associated irrigation and drainage facilities.

The Ord River Dam was constructed over three dry seasons, 1969 to 1971, and was officially opened on 30 June 1972. A pump station and irrigation supply facilities to bring 2,020 hectares of new irrigation farmland into production on Packsaddle Plain was completed in December 1973. An extension of the scheme covering 770 hectares on Ivanhoe Plain was completed in December 1974.

**Fitzroy River.** The Camballin irrigation area is situated on the Liveringa flood plain, 105 kilometres south-east of Derby. Irrigation water from the Fitzroy River is diverted by means of a weir with a capacity of 4.7 million cubic metres into Uralla Creek, an anabranch, for twenty-seven kilometres to another dam with a storage of 5.5 million cubic metres constructed on Uralla Creek. Later it will be necessary to construct a storage dam on the upper reaches of the Fitzroy River for the large-scale developments envisaged for this area.

The irrigation works were constructed by the Western Australian Government in terms of the *Northern Developments Pty. Limited Agreement Act 1969-1978*. Although only an area of up to 2,600 hectares of rice and grain sorghum has been irrigated in any one year, a much larger area, which is capable of being irrigated while the river is flowing, has been developed. The company which has interests in a number of cattle stations in the Kimberleys, developed a feed lot capable of handling up to 7,500 head at a time. However, the economic downturn in the beef industry which occurred at about that time, resulted in little further activity between 1974 and 1979. In 1980 the construction of a flood protection levee and further large-scale irrigation was undertaken.

#### IRRIGATION: ORD AND CAMBALLIN DISTRICTS

Particulars		Irrigation district					
		Ord		Camballin		Total	
		1978-79	1979-80	1978-79	1979-80	1978-79	1979-80
Area watered	hectares	4,319	5,619	40	40	4,359	5,659
Hectare waterings (a)		24,187	43,868	360	80	24,547	43,948
Average number of waterings (b)		5.6	7.8	9.0	2.0	5.6	7.8
Total water gauged at entry to district	'000 cu m	49,121	83,745	240	135	49,361	83,880
Dam capacity	" "	5,821,649	5,821,649	11,639	11,639	5,833,288	5,833,288
Length of channels	km	116	116	32	32	148	148

(a) Area watered multiplied by number of waterings. Figures are the sum of hectare waterings for individual holdings in each district. (b) Total hectare waterings divided by total area watered.

## WATER RESOURCES INVESTIGATION AND MEASUREMENT

Work on the investigation and measurement of the water resources of Western Australia, both surface and underground, has continued in recent years with the support of the Australian Water Resources Council, which was established by joint action of the Commonwealth Government and State Government in 1962. The Council comprises Commonwealth Government and State Government Ministers primarily responsible for water resources.

The primary objective of the Council is the provision of a comprehensive assessment on a continuing basis of Australia's water resources, and the extension of measurement and research so as to provide a sound basis for the planning of future development.

In terms of its main objective, the Council in 1964 recommended, and the Commonwealth Government and State Governments agreed, that there should be an accelerated programme of establishment of stream gauging stations and investigation of underground water. Financial assistance to the States was rendered by the Commonwealth Government under the *States Grants (Water Resources) Act 1964*, subject to certain qualifying expenditure by each State. Under various States Grants (Waters Resources Measurement) Acts and the *States Grants (Water Resources Assessment) Act 1976*, financial assistance to the States was continued to 30 June 1979. Since then financial assistance has been provided through the *National Water Resources (Financial Assistance) Act 1978*.

### Surface Water

To enable the surface water resources of Western Australia to be managed efficiently a network of gauging stations has been set up to monitor the quantity and quality of stream flows throughout the State. A wide range of stream and catchment sizes in a variety of landscapes, environments and climates is being measured. An increasing amount of research is also being carried out to determine the effects of changing land-use practices on the salinity of water in dams and streams.

The number of stream-gauging stations in operation increased each year until 30 June 1979 when the number totalled 303. Because of financial constraints few new stations have been built since that time and operations in the Timor Sea Division were suspended from October 1980. The network is kept under continual review, with stations being closed when they are no longer required. All stations are under the control of the Public Works Department.

The distribution of operational gauging stations in the various drainage divisions is as follows:

South-West Coast Division (Esperance to the Hill River)	215
Indian Ocean Division (Arrowsmith River to the De Grey River)	50
Timor Sea Division (Broome to the Ord River)	—
Total	<hr/> 265 <hr/>

### Underground Water

To locate and measure the quantity and quality of underground water available to supply the ever-growing needs of town water supplies, industries, farmers, pastoralists, etc. a considerable amount of investigation, including drilling, is in progress in Western Australia. The work is being carried out by the Department of Mines, the Public Works Department, and the Metropolitan Water Supply, Sewerage, and Drainage Board, with the Department of Mines assuming the major responsibility for hydro-geological work.

Underground water exploration projects in course during 1979-80 included major investigations of shallow aquifers south of Perth, which may provide water to augment Perth's water supply. Other investigations designed to locate underground water to provide or augment the water supplies for country towns and new mining developments are continuing.

## SEWERAGE SCHEMES

**Metropolitan Sewerage**

There are ten sewerage systems administered by the Metropolitan Water Supply, Sewerage, and Drainage Board within the metropolitan area.

Wastewater from the major systems either gravitates or is pumped through the pipe systems to treatment plants at Point Peron, Subiaco, Swanbourne, Woodman Point and Beenyup. After treatment the effluent is discharged into the Indian Ocean, some distance from the coast under a substantial depth of water.

The other five systems are served by treatment plants at Canning Vale, Westfield, Kwinana, Kelmscott and Forrestfield, the treated effluent being disposed of in sandy soil in the vicinity of the plant sites.

In addition, the Board is operating temporary, extended aeration plants at Two Rocks, Wanneroo and Yanchep and is also operating extended aeration package plants on behalf of Westrail at Kewdale and the Kalamunda Hospital Board.

## METROPOLITAN SEWERAGE SYSTEMS

At 30 June —	Services (a)	Length of sewers
	number	kilometres
1975	111,300	2,635
1976	120,000	2,886
1977	128,000	3,151
1978	138,000	3,345
1979	148,000	3,555
1980	220,020	3,749

(a) Only residential services shown prior to 1980. All services shown at 30 June 1980.

**Country Towns Sewerage**

At 30 June 1980 forty-five towns outside the metropolitan area had sewerage schemes which were constructed pursuant to the *Country Towns Sewerage Act 1948-1978*. In addition, a further sixteen schemes have been provided by local government authorities under provisions of the Health Act, and ten as private development in mining areas by mining companies. Several other local government authorities have reached an advanced stage of planning to commence schemes in future years.

The following table shows the number of towns sewered, the area sewered and the number of services controlled by the Public Works Department at 30 June for each of the years 1975 to 1980. Details of the individual towns serviced are given in the succeeding table.

## COUNTRY SEWERAGE SYSTEMS

At 30 June —	Number of towns sewered	Area sewered	Length of sewers	Services
	number	hectares	kilometres	number
1975	33	3,905	475	14,276
1976	33	4,348	522	15,431
1977	36	4,781	565	17,723
1978	37	5,273	619	19,105
1979	41	5,521	657	20,886
1980	44	6,313	748	23,353

## COUNTRY SEWERAGE SYSTEMS: AREA SEWERED, SEWERS AND NUMBER OF SERVICES

Town	At 30 June 1979			At 30 June 1980		
	Area sewered	Length of sewers	Services	Area sewered	Length of sewers	Services
	hectares	kilometres	number	hectares	kilometres	number
Albany	681	94.9	3,217	769	106.9	3,398
Bunbury	407	50.1	1,865	498	61.8	2,204
Bussetton	21	2.6	n.a.	30	2.8	12
Collie	293	39.9	1,367	306	41.7	1,474
Corrigin	69	9.4	252	76	10.4	269
Cunderdin	33	7.1	137	34	7.2	140
Denmark	8	1.6	30	8	1.6	30
Derby	7	0.9	37	7	0.9	93
Eaton	14	2.8	1	20	3.9	12
Eneabba	34	2.4	57	34	2.4	58
Esperance	..	..	..	22	2.4	51
Exmouth	82	10.8	561	82	10.8	568
Geraldton	39	3.6	158	84	10.1	199
Gnowangerup	78	8.2	220	78	8.2	237
Halls Creek	..	..	..	31	2.4	66
Harvey	85	8.7	216	149	15.6	297
Karratha	352	31.0	1,274	396	36.4	1,447
Katanning	254	30.9	803	288	34.2	923
Kellerberrin	101	9.5	153	108	10.4	167
Kojonup	73	8.8	216	93	9.4	227
Kununurra	111	10.3	316	111	10.3	373
Laverton	46	5.5	235	46	5.5	236
Leeman	8	1.5	58	12	1.9	58
Mandurah	356	42.3	703	445	53.1	911
Manjimup	n.a.	3.3	n.a.	88	8.9	90
Meckering	25	2.5	42	25	2.5	42
Merredin	188	23.0	618	194	23.5	676
Mount Barker	72	9.5	94	72	9.5	108
Mukinbudin	44	3.2	74	44	3.2	93
Narembeen	56	4.7	92	57	4.8	139
Narrogin	279	33.2	1,174	299	35.7	1,263
Northam	432	59.3	2,511	448	61.2	2,450
Pingelly	77	8.1	116	77	8.1	120
Pinjarra	154	16.2	518	164	17.1	573
Port Hedland	73	11.0	471	73	11.0	516
South Hedland	435	37.3	1,478	435	37.3	1,725
Roebourne	54	6.0	137	54	6.0	157
Three Springs	51	4.0	193	53	4.2	200
Wagin	83	11.6	372	91	12.3	390
Wickham	89	16.1	476	120	19.8	546
Wongan Hills	80	9.2	210	82	9.4	227
Wundowie	41	7.1	243	41	7.1	243
Wyalkatchem	48	7.4	162	48	7.4	162
Wyndham	121	8.5	166	121	8.5	183
Total	r 5,554	r 664.1	r 21,023	6,313	748.0	23,353

## CHAPTER VIII — PRODUCTION

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## CHAPTER VIII — PRODUCTION

In this Chapter 'production' denotes those economic activities with output in the form of 'goods' or 'commodities' which will be marketed as raw materials, fuels, semi-processed articles or finished products. This definition excludes building and construction activity which is covered in Chapter V, Part 5.

The Chapter is divided into three Parts which deal with the major sectors of production as follows:

Part 1 Agriculture, Forestry, Fishing and Hunting

Part 2 Mining

Part 3 Manufacturing and Electricity and Gas.

The subdivision of the Chapter into Parts 1, 2 and 3 is based on 'industry divisions' in the Australian Standard Industrial Classification (ASIC), and also reflects the current stage of development of economic statistics whereby information presented in Part 2 and Part 3 comes mainly from a system of integrated economic censuses based on ASIC, whereas only some statistics in Part 1 have been included in this system. A brief description of ASIC and the system of integrated economic censuses is given below.

### Australian Standard Industrial Classification (ASIC)

In 1978 the Australian Bureau of Statistics issued the 'Australian Standard Industrial Classification (1978 Edition)', or 'ASIC', which sets out a classification of all economic activities grouped into four levels of 'industry' in which the activities are primarily carried out. This replaced the 'Australian Standard Industrial Classification (Preliminary Edition)', which operated from 1969. At the broadest level of the classification, economic activities are grouped into the following 'industry divisions':

Division A Agriculture, Forestry, Fishing and Hunting

B Mining

C Manufacturing

D Electricity, Gas and Water

E Construction

F Wholesale and Retail Trade

G Transport and Storage

H Communication

I Finance, Property and Business Services

J Public Administration and Defence

K Community Services

L Recreation, Personal and Other Services

Each industry division is further divided into industry sub-divisions, groups and classes. An example from the Manufacturing division is given below:

Industry Division	: C	Manufacturing
Industry Sub-division	: 28	Non-Metallic Mineral Products
Industry Group	: 286	Clay Products and Refractories
Industry Class	: 2861	Clay Bricks

Economic units are classified to industry division, sub-division, group and class, in that order, based on the predominant activities among all the activities carried out by the unit concerned. The basic economic unit is the *establishment* which generally represents the total

operations under one ownership at one physical location (e.g. a farm, a shop, a factory, a mine). In some cases (e.g. electricity and gas production and distribution) the location constraint is relaxed to cover the total operations under one ownership in one State. Some separately-located units which exist primarily to provide services to other establishments under the same ownership (e.g. separately-located administrative offices, laboratories, warehouses, manufacturers' sales offices not holding stocks, etc.) are regarded as *ancillary units* and are classified to the industry of the establishments served rather than to an industry based on the activity performed. If all the activities of all establishments and ancillary units under the same ownership are considered together the unit is described as the *enterprise*, or all the operations of a single entity in Australia. The final unit in the hierarchy is the *enterprise group* which is the group of legal entities owned or controlled by a single legal entity (e.g. a parent company and its subsidiaries as defined in the Companies Act).

### **Integrated Economic Censuses**

In 1968-69 the Australian Bureau of Statistics commenced a programme of integrated economic censuses to replace or add to the range of existing censuses developed independently over many years. By employing standard definitions of data items as described below and by using the standard definitions of units and methods of classification set out in ASIC, the programme was designed to remove many inconsistencies, gaps and overlaps between existing censuses and thereby permit comparisons of data across broad sectors of economic activity.

Statistics published from the integrated economic censuses are mainly *establishment statistics* or statistics resulting from the aggregation of data for individual establishments and ancillary units. In this Chapter most of the statistics in Parts 2 and 3 are establishment statistics from integrated censuses and data for the standard items can be regarded as comparable between the two Parts. However, the sectors of production covered by Part 1 of this Chapter have not been fully included in the system of integrated economic censuses and consequently some of the statistics in Part 1 differ in scope from those in Parts 2 and 3. Tables showing enterprise structure, industry, etc. together with the table setting out estimates of turnover, expenditure, value added, etc. are based on fully integrated data, whereas the commodity statistics (area and production of crops, livestock numbers, etc.) are the traditional holding-based information which is collected irrespective of enterprise or establishment structure.

**Enterprise Statistics.** Since an enterprise is defined as a single legal entity, the use of the enterprise as the unit of aggregation provides statistics which are often of more value than establishment statistics in considering questions related to management and ownership. The statistics which result from the aggregation of enterprise data are different from establishment statistics since, for enterprises comprised of establishments operating in different industries, the industry classification of the enterprise depends on the respective contributions of each establishment to the value added of the enterprise. For example, an enterprise operating a mine and a factory contributes to both mining and manufacturing in establishment statistics whereas, in enterprise statistics, it is classified wholly to either mining or manufacturing depending on which establishment has the greater value added.

The concept of an enterprise has no geographical limits other than the requirement that only operations within Australia are included. For this reason enterprise statistics generally relate only to Australia as a whole and are not dissected into State components, except in Part 1 (Agriculture). Where published, such statistics show the number of enterprises in each ASIC industry class together with data for the standard set of establishment items described below, plus additional items collected only at the enterprise level such as rent and leasing revenue, land tax, rates and pay-roll tax, employer contributions to superannuation schemes, depreciation, interest and royalties (paid and received) and other expenses.

**Standard Data Items in Integrated Censuses.** A necessary part of the system of integrated economic censuses was the adoption of common definitions for data items common to all censuses. Listed below are the definitions of the standard data items appearing in tables in Parts 1 to 3 of this Chapter.

*Number of Establishments.* The number of establishments as defined above operating at 30 June of each year. Numbers of separately-located administrative offices and ancillary units serving the establishments are not included.

*Persons Employed.* Working proprietors and employers on the pay-roll including those working at separately-located administrative offices and ancillary units.

*Wages and Salaries.* The wages and salaries of all employees including those at separately-located administrative offices and ancillary units. Amounts drawn by working proprietors are not included.

*Turnover.* Sales (exclusive of excise and sales tax) of goods, whether produced in the establishment or not, plus transfers out of goods to other establishments of the same enterprise, plus bounties and subsidies on production, plus all other operating revenue (such as commission, repair and service revenue), plus capital work done for own use, or for rental or lease. Rent and leasing revenue, interest income, royalties and receipts from the sale of fixed tangible assets are excluded.

*Stocks.* All the stocks of materials, fuels, etc. and finished goods and work-in-progress of the establishment, whether located at the establishments or elsewhere in Australia.

*Purchases, Transfers In and Selected Expenses.* Purchases of materials, fuel, power, stores, containers, etc. plus transfers in of goods from other establishments of the same enterprise, plus charges for commission and sub-contract work, repair and maintenance expenses, outward freight and cartage, motor vehicle running expenses and sales commission payments.

*Value Added.* Turnover, plus increase (or less decrease) in the value of stocks, less purchases, transfers in and selected expenses.

*Rent and Leasing Expenses.* Outlay on rent and leasing of buildings, vehicles, machinery, plant and equipment.

*Fixed Capital Expenditure.* Outlay on new and secondhand fixed tangible assets, less disposals, including expenditure on establishments not yet in operation.



## Chapter VIII — continued

### Part 1 — Agriculture, Forestry, Fishing and Hunting

#### INTEGRATED AGRICULTURAL STATISTICS

Information from all units operating within the agricultural sector was obtained at a special census conducted in 1974 and used to create an additional data base, using the methodology of the Australian Standard Industrial Classification (ASIC) and compatible definitions with those of the Integrated Economic Censuses for Establishments, Enterprises and Enterprise Groups.

The identification of economic units within the agricultural sector has allowed the production of more meaningful statistics of economic size, legal status and industry classification. It has also provided some insight into the activities of agricultural enterprises in other sectors of the economy and the activities of non-agricultural enterprises in the agricultural sector.

The number of economic units operating in the agricultural sector, their industry, legal status and size together with a tabulation of certain financial aggregates are shown in the next three tables.

#### AGRICULTURAL ENTERPRISES — INDUSTRY AND LEGAL STATUS WESTERN AUSTRALIA: 1978-79

Industry of enterprise		Legal status						Total enterprises
		Sole operator	Family partnership	Other partnership	Private incorporated company	Public incorporated company	Other (a)	
ASIC code	Description							
0124	Poultry for meat	2	31	1	3	—	—	37
0125	Poultry for eggs	26	80	2	5	—	7	120
0134	Grapes	115	153	4	2	—	2	276
0135	Plantation fruit	16	72	1	—	—	—	89
0136	Orchard and other fruit	223	523	17	15	—	7	785
0143	Vegetables — Potatoes	36	203	—	—	—	—	239
0144	Vegetables — Other	144	438	12	8	—	2	604
0181	Cereal grains (incl. Oilseeds n.e.c.)	269	1,700	60	86	2	43	2,160
0182	Sheep/Cereal grains	554	4,555	114	202	—	105	5,530
0183	Meat cattle/Cereal grains	33	76	3	5	1	3	121
0184	Sheep/Meat cattle	146	627	23	37	1	12	846
0185	Sheep	421	1,467	74	120	3	32	2,117
0186	Meat cattle	539	1,260	58	97	1	22	1,977
0187	Milk cattle	63	511	10	12	—	8	604
0188	Pigs	45	145	9	4	—	2	205
0191	Sugar cane	—	—	—	—	—	—	—
0192	Peanuts	—	—	—	—	—	—	—
0193	Tobacco	—	—	—	—	—	—	—
0194	Cotton	—	—	—	—	—	—	—
0195	Nurseries and specialised horticultural activities (except forest nurseries)	41	87	8	11	—	2	149
0196	Agriculture n.e.c.	71	112	8	12	—	3	206
Total (ASIC code 01)		2,744	12,040	404	619	8	250	16,065

(a) Includes co-operative societies, trusts and estates.

For those units within ASIC Subdivision 01: Agriculture, which operate land, industry classifications are determined annually by applying unit prices to each agricultural activity undertaken by individual units and by then assessing the predominant activity according to the estimated values derived. For units that do not operate land (e.g. bee keepers), industry classifications are determined by each operator's description of his activities.

For enterprise and establishment units, which are predominantly engaged in activities covered by ASIC Subdivision 01: Agriculture, referred to respectively as agricultural enterprises and agricultural establishments the procedure for determining industry classification is also used for size classification purposes. For each unit, an 'estimated value of operations' (which includes both agricultural and non-agricultural operations) is calculated.

The following table shows the number of agricultural enterprises classified according to estimated value of operations and legal status for the year 1978-79.

AGRICULTURAL ENTERPRISES  
ESTIMATED VALUE OF OPERATIONS AND LEGAL STATUS  
WESTERN AUSTRALIA: 1978-79

Estimated value of operations (\$'000)	Legal status						Total enterprises
	Sole operator	Family partnership	Other partnership	Private incorporated company	Public incorporated company	Other (a)	
2 — 9	1,096	1,740	82	61	—	42	3,021
10 — 19	418	1,194	36	38	—	15	1,701
20 — 29	286	832	30	27	2	14	1,191
30 — 39	222	812	22	32	—	16	1,104
40 — 49	167	844	29	27	2	19	1,088
50 — 59	143	839	27	18	—	8	1,035
60 — 74	127	1,122	27	53	1	17	1,347
75 — 99	124	1,508	46	78	1	27	1,784
100 — 149	105	1,606	35	111	—	36	1,893
150 — 199	27	776	25	63	—	28	919
200 and over	29	767	45	111	2	28	982
Total all size groups	2,744	12,040	404	619	8	250	16,065

(a) Includes co-operative societies, trusts and estates.

The following table shows estimates of turnover, expenditure, cash operating surplus, capital expenditure and indebtedness of agricultural enterprises for the years 1976-77 and 1977-78. The data are obtained from the Agricultural Finance Surveys which were conducted over four years until 1977-78 by the Australian Bureau of Statistics. They contain economic statistics relating to agricultural industries which are comparable with those from the manufacturing, mining and retailing sectors of the economy. They differ from *value of primary commodities produced* data in the following ways.

- (1) Data relate only to enterprises whose predominant activity is agriculture, whereas *value of primary commodities produced* data relate to the value of the total recorded production of commodities in a given year regardless of the predominant activity of enterprise.
- (2) The information relates to transactions on a cash rather than an accrual basis for agricultural enterprises during specific financial years. It does not therefore relate to one specific crop, season, etc.

Separate sample estimates have been calculated for components and totals at all levels. Users should exercise care when using the data, as the sample estimation methods used may result in the aggregate of the component estimates not necessarily being the same as the separate estimates of the the total. Since the standard errors are, in general, lower for totals than for individual components, the totals can be taken to be a more reliable estimate than the addition of the component items.

Sample estimates may differ from results which have been obtained from a comparable complete collection. A measure of the likely difference is given by the standard error of the estimates. There are about two chances in three that a sample estimate will differ by less than one standard error from the figures that would have been obtained from a comparable complete collection, and about nineteen chances in twenty that the differences will be less than two standard errors. For example, if a sample survey gives an estimate of \$4,000 million and the

standard error of this estimate is 2 per cent i.e. \$80 million, then there would be two chances in three that a comparable complete collection would give a figure within the range of \$3,920 million to \$4,080 million, and nineteen chances in twenty that the figure would be within the range of \$3,840 million to \$4,160 million.

For a more detailed explanation of the methodology and terminology used the reader is referred to the bulletin *Agricultural Sector, Part IV, Financial Statistics 1977-78* (Catalogue No. 7507.0) published by the Australian Statistician, Canberra.

ESTIMATES OF TURNOVER, EXPENDITURE, CASH OPERATING SURPLUS, CAPITAL  
EXPENDITURE AND INDEBTEDNESS OF AGRICULTURAL ENTERPRISES  
WESTERN AUSTRALIA

Item	1976-77		1977-78	
	\$ million	Standard error %	\$ million	Standard error %
Sales from crops	525.8	4	342.7	4
Sales from livestock	158.1	5	200.3	5
Sales from livestock products	282.7	5	280.8	3
Other miscellaneous revenue	27.8	12	30.0	12
Turnover	995.9	3	854.7	2
Less Marketing expenses	93.6	5	85.9	3
Purchases of livestock	33.6	11	53.5	10
Payments for seed and fodder	24.1	8	28.5	10
Payments for fertiliser	81.9	5	82.4	4
Payments for chemicals, etc. veterinary supplies and services	16.1	7	16.8	5
Payments for electricity and fuel	41.6	3	44.5	3
Water and drainage charges	3.0	27	1.4	16
Payments to contractors	39.7	9	36.8	5
Repairs and maintenance	69.4	5	61.9	4
Other selected expenses	15.4	8	15.2	8
Purchases and selected expenses	418.5	3	426.9	3
Value added (a)	537.5	4	399.9	5
Less Rates and taxes	12.3	4	12.7	4
Insurance payments	12.1	5	11.6	4
Other expenses	21.2	6	22.6	5
Rent and leasing expenses (other than land)	5.5	25	5.2	25
Plus Rent and leasing revenue (other than land)	5.8	39	2.7	15
Adjusted value added (a)	492.3	4	350.6	5
Less Wages, salaries and supplements	60.4	7	57.0	7
Gross operating surplus (a)	431.9	5	293.6	6
Less Interest, land rent paid	43.1	8	46.6	7
Plus Interest, land rent received	14.4	15	12.8	16
Cash operating surplus (b)	443.1	5	287.7	6
Total net capital expenditure	157.6	7	133.7	7
Loans by banks, pastoral and insurance companies	263.4	9	351.7	8
Loans under hire purchase and other instalment credit	52.4	20	67.9	11
Other amounts owing	145.6	14	132.9	15
Gross indebtedness	461.3	8	552.4	7

(a) Includes estimate for increase in value of livestock.

(b) Excludes estimate for increase in value of livestock.

### VALUE OF PRIMARY COMMODITIES PRODUCED

For primary production (i.e. agriculture, forestry, fishing and hunting) the *gross value* is based on the wholesale price realised 'at the principal market'. Where primary products are consumed at the place of production or where they become raw material for secondary industry within the State, these points of consumption are taken as the 'principal market'.

The '*local value*' is the value at the source of production and is obtained by deducting marketing costs from the gross value. Marketing costs comprise freight, cost of containers, commission, and other charges incurred in marketing. Gross values provide a reliable measure of the value of production of any particular commodity or group but when comparing or combining values for primary industries with those for secondary industries the value added series of financial statistics from the Agricultural Finance Survey should be used.

Gross values of the principal items are shown in the next table for each of the years 1974-75 to 1979-80.

Wheat was the most important item in 1979-80 with a gross value of \$571.2 million, followed by wool (including felled and exported on skins) with \$357.3 million. Forestry contributed \$34.5 million, fishing \$100.0 million and hunting \$3.7 million.

PRIMARY COMMODITIES PRODUCED  
GROSS VALUE OF PRINCIPAL ITEMS  
(\$'000)

Commodity group and commodity	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Agriculture —						
Crops —						
Barley	33,822	52,399	60,910	68,352	69,141	74,179
Oats	18,045	32,700	28,906	31,100	30,319	28,817
Wheat	361,211	427,507	290,489	292,901	546,827	571,158
Hay (all kinds)	14,144	10,048	10,760	15,374	18,085	18,915
Pasture seed —						
Barrel medic	138	125	157	129	371	141
Subterranean clover	1,531	936	1,584	1,734	2,202	3,510
Cotton	1,752	—	—	—	—	—
Nursery products (a)	3,975	4,682	5,939	7,868	10,475	10,209
Vegetables —						
Cauliflowers	1,752	1,600	1,933	2,419	4,060	3,393
Lettuce	1,286	1,192	1,220	1,900	2,054	2,128
Onions	1,025	1,221	1,342	1,529	2,324	2,716
Potatoes	8,806	12,320	11,247	9,532	12,875	14,839
Tomatoes	2,714	3,284	4,053	3,855	3,629	4,269
Fruit —						
Apples	11,890	12,594	12,323	11,443	16,464	17,968
Bananas	1,733	2,205	2,502	4,057	5,049	2,101
Oranges	1,239	1,281	1,620	2,009	1,612	1,909
Pears	1,159	1,161	2,202	1,326	1,729	2,085
Plums and prunes	1,091	1,167	1,460	1,782	1,958	2,092
Vine fruits	2,072	1,999	2,246	2,249	3,362	3,437
Livestock slaughterings —						
Cattle and calves	40,092	45,803	65,062	76,931	101,398	149,165
Sheep and lambs	21,942	23,118	32,714	39,548	49,888	71,812
Pigs	16,936	18,211	18,348	18,994	21,500	27,205
Poultry	12,917	13,865	16,004	19,771	22,536	26,274
Livestock products —						
Wool (shorn and dead)	218,513	241,796	275,093	257,411	285,852	347,466
Whole milk (b)	20,458	20,660	23,274	25,539	36,549	41,865
Eggs	12,032	12,431	14,037	15,477	16,310	17,283
Honey	935	1,174	1,603	763	1,418	1,837
Forestry	19,995	23,404	26,349	28,016	27,612	34,473
Fishing —						
Prawns	4,564	10,960	12,334	17,056	16,000	13,411
Rock lobsters	19,929	29,493	44,141	50,880	56,818	62,090
Fish	2,549	3,633	4,291	6,725	6,085	8,690
Hunting	1,657	1,744	2,622	2,675	4,842	3,704

(a) Value of seedlings, cut flowers, bulbs, trees, etc. produced.

(b) Includes Commonwealth Government subsidy.

SUMMARY OF AUSTRALIAN STATISTICS

The following table contains a selection of the principal statistics of primary production in each of the Australian States for 1978-79.

PRINCIPAL STATISTICS OF PRIMARY PRODUCTION  
AUSTRALIA: 1978-79

Particulars	Unit	N.S.W.	Vic.	Qld.	S.A.	W.A.	Tas.	Australia (a)
Agricultural establishments —								
Area	'000 ha	65,062	14,441	156,305	62,655	116,247	2,232	493,207
Principal crops —								
Wheat for grain —								
Area	'000 ha	3,162	1,337	747	1,295	3,706	1	10,249
Production	'000 tonnes	6,640	2,998	1,962	2,086	4,400	3	18,090
Oats for grain —								
Area	'000 ha	431	291	30	171	427	9	1,359
Production	'000 tonnes	594	446	43	177	491	12	1,763
Hay all types —								
Area	'000 ha	235,730	509,625	32,046	219,612	183,842	68,035	1,251,703
Production	'000 tonnes	788,939	2,012,410	163,159	665,837	585,819	304,847	4,530,507
Pasture seed	tonne	2,452	3,171	225	3,964	3,583	722	14,126

PRINCIPAL STATISTICS OF PRIMARY PRODUCTION  
AUSTRALIA: 1978-79—continued

Particulars	Unit	N.S.W.	Vic.	Qld.	S.A.	W.A.	Tas.	Australia (a)
Onions —								
Area	hectare	804	703	890	881	189	278	3,747
Production	tonne	16,887	17,009	23,696	27,377	8,035	12,228	105,297
Potatoes —								
Area	hectare	8,256	11,256	5,857	3,582	2,039	3,655	34,658
Production	tonne	124,156	279,613	114,519	89,399	62,572	124,385	794,745
Other vegetables —								
Area	hectare	16,315	13,111	21,385	5,558	3,396	9,085	(b)68,999
Apples —								
Number of trees	'000 trees	1,184	1,187	1,001	534	848	1,206	5,964
Production	tonne	65,815	89,343	39,245	20,092	45,079	85,230	344,948
Pears —								
Number of trees	'000 trees	170	1,048	110	137	90	47	1,602
Production	tonne	7,807	100,896	3,945	7,120	5,179	2,643	127,590
Oranges —								
Number of trees	'000 trees	2,628	699	228	1,512	231	—	5,299
Production	tonne	158,693	40,951	21,168	141,398	6,338	—	368,554
Vineyards —								
Area	hectare	14,604	20,558	1,566	31,277	2,560	62	70,633
Grapes (all purposes)	tonne	158,741	242,824	6,057	298,203	10,488	41	716,354
Livestock numbers, 31 March 1979 —								
Sheep and lambs	'000	48,400	22,750	13,592	14,940	30,265	4,157	134,222
Cattle	'000	6,484	4,134	10,859	1,086	2,092	660	27,107
Pigs	'000	725	390	487	330	271	61	2,268
Livestock slaughtered for human consumption —								
Sheep	'000	3,470.0	3,878.5	863.4	1,021.9	2,394.5	345.4	11,979.4
Lambs	'000	5,283.1	5,398.9	578.8	1,501.1	1,382.1	502.9	14,810.7
Cattle	'000	2,897.6	2,023.3	2,934.2	567.7	705.5	226.7	9,528.0
Calves	'000	358.7	905.1	361.7	90.8	40.9	54.5	1,819.7
Pigs	'000	1,059.3	961.1	721.0	402.3	327.2	90.5	3,588.6
Wool production	mil. kg	239.6	138.6	63.9	87.4	156.6	19.1	705.8
Whole milk production —								
All purposes	'000 litres	879,865	3,247,553	588,073	321,199	212,918	390,777	5,659,445
Fisheries production —								
Fish, live weight	tonne	25,803	9,303	5,085	9,484	9,540	2,605	63,395
Crustaceans, live weight	tonne	2,326	279	10,747	4,428	15,034	1,305	37,640
Gross value of production —								
Agriculture	\$'000	3,074,206	2,148,567	2,207,379	1,084,142	1,339,823	262,308	10,232,709
Forestry	\$'000	81,398	42,951	35,738	19,463	27,612	66,058	276,792
Fishing and pearling	\$'000	42,698	20,025	58,214	30,475	96,055	14,636	279,720
Hunting	\$'000	16,390	11,500	3,024	1,038	4,842	1,321	38,115

(a) Includes Northern Territory and Australian Capital Territory except where indicated; see footnote (b). (b) Incomplete; excludes Northern Territory and/or Australian Capital Territory.

The gross value of primary production (excluding mining) for Australia as a whole in 1978-79 amounted to \$10,827 million, of which Western Australia contributed \$1,468.3 million or 13.6 per cent of the total. The major contributor was New South Wales with \$3,214.7 million or 29.7 per cent.

The total area of agricultural establishments in Australia was 493,207,000 hectares. Agricultural establishments in Queensland occupied the largest area (156,305,000 hectares), followed by Western Australia (116,247,000 hectares). Western Australia, with 3,705,610 hectares, had the largest area under wheat for grain in 1978-79.

### SEASONAL CALENDAR

The following calendar is intended to show the main periods when principal agricultural and pastoral activities are carried out in Western Australia. Operations are generally confined to the periods shown but are subject to variation according to such factors as geographical location within the State, the variety of seed sown (or trees and vines planted) and exceptional seasonal conditions.

# SEASONAL CALENDAR

Item	Period	
	Sowing or planting	Harvesting
Pastures —		
Clovers	April to June	December to April
Medics	April to June	December to April
Grain —		
Wheat	May to mid-July	November to January
Oats	May and June	November and December
Barley	May to July	November and December
Rye	May and June	November and December
Sweet Lupins	April to June	November to January
Hay —		
Wheaten	May and June	October and November
Oaten	April to June	October and November
Linseed	May to July	December and January
Vegetables —		
Beans, Runner —		
Carnarvon area	March to September	May to November
Perth Division	August to March	November to June
Green Peas —		
For processing	May to September	October to December
Fresh	May to September	August to December
Potatoes —		
Early planting —		
Perth and South-West	June and July	October to December
Mid-season planting —		
Perth, South-West and Lower Great Southern	July to November	November to March
Late planting —		
South-West and Lower Great Southern	November to February	February to June
Onions	March to November	September to April
Tomatoes —		
Carnarvon and Geraldton areas	February to August	May to December
Other areas	June to February	October to June
Fruit —		
Apples	June to August	February to May
Apricots	June and July	December and January
Bananas	September to March	July to June
Lemons	July and August	July to June
Mandarins	July and August	May to September
Nectarines	June and July	January and February
Olives	July and August	March and April
Oranges, Navel	July and August	May to September
Oranges, Valencia	July and August	August to February
Peaches	June and July	December to March
Pears	June and July	February and March
Plums	June and July	December to March
Grapes —		
For table use	July to September	January to May
For wine making	July to September	February to April
For drying	July to September	February
Shearing and lambing —		
Shearing —		
Pastoral areas	March to August	
Agricultural areas	February to November	
Lambing —		
Pastoral areas	April to July	
Agricultural areas	April to September	

## LAND UTILISATION ON AGRICULTURAL ESTABLISHMENTS

In 1979-80 there were 18,395 agricultural establishments in the State, comprising 115 million hectares of land or about 46 per cent of the total area of Western Australia.

In recent years, the Australian Bureau of Statistics has been gradually excluding from the statistics those establishments (previously rural holdings) whose contribution to agricultural production is small. Prior to 1975-76 the term rural holding was used to describe 'a piece of land of one hectare or more, used for the production of agricultural products or for the raising of livestock and the production of livestock products'. Data were also collected from holdings of less than one hectare on which commercial market gardens, nurseries, poultry farms or hatcheries were operated. Since 1975-76 the Australian Bureau of Statistics has only collected

data from establishments (which, unlike holdings, need not be land based) with agricultural activity if the enterprise operating the establishment had or was expected to have estimated value of agricultural operations of \$1,500 or more during the current season. Although the new definition resulted in changes to the number of establishments appearing in publications the effect on the statistics of production of major commodities is small. Statistics of minor commodities normally associated with small scale operations may be affected to a greater extent.

Of the total area of agricultural establishments, over 5.2 million hectares were used for crops and 7.1 million hectares were under sown pasture. The balance consists mainly of uncleared land (most of which is pastoral leases held by sheep and cattle stations), but it also includes cleared land used for grazing or which was resting during the season, fallowed areas, newly cleared land and small areas of lucerne.

Land development in the post-war period was stimulated by generally favourable prices for agricultural and pastoral commodities. Special concessions to primary producers under the provisions of the taxation legislation also contributed to the increased capital investment in primary industry. This development, undertaken principally by established farmers and by the War Service Land Settlement Board, was aided by the introduction of modern mechanical methods of land clearing. As a result, the area of land used for crops increased from 1.4 million hectares in 1946-47 to over 5.2 million hectares in 1979-80. This is the largest area of crops recorded in Western Australia. The area under sown pastures expanded from 0.8 million hectares in 1946-47 to more than 7.8 million hectares in 1974-75.

Details of land utilisation in the six years to 1979-80 are given in the next table together with the number of active agricultural establishments. When examining the following tables the effect of the change in definition explained above should be borne in mind.

#### LAND UTILISATION

Season	Active agricultural establishments (number)	Land use during the season (hectares)				Total area of establishments (hectares)
		Used for crops	Under sown pastures	Lucerne (all purposes)	Balance of establishments	
1974-75	20,500	3,757,626	7,837,053	13,164	103,992,848	115,600,691
1975-76	18,871	4,207,158	7,447,823	15,367	104,618,561	116,288,909
1976-77	17,817	4,416,434	7,053,802	12,560	103,738,536	115,221,332
1977-78	17,767	4,910,100	7,203,923	9,817	102,366,792	114,490,632
1978-79	17,747	4,993,049	7,522,673	9,605	103,721,207	116,246,534
1979-80	(a) 18,395	5,279,875	7,132,526	8,700	102,502,122	114,923,223

(a) Includes beekeepers without land.

The following table shows a classification of agricultural establishments according to size of establishment for 1979-80. For the State as a whole the largest group of establishments is in the size range 1,000 to 1,999 hectares and the 3,885 establishments concerned represent 21 per cent of the total number of establishments in the State.

The next largest group is establishments in the range 2,000 to 2,999 hectares and the 1,544 establishments in this category account for over 8 per cent of the total. Over 13 per cent of all establishments are under twenty hectares in size.

In the 'agricultural areas' there were 17,719 establishments for a total area of 23,469,873 hectares of land. In the 'pastoral areas' there were 676 establishments comprising an area of 91,453,350 hectares. Further details of 'pastoral areas' appear later in this Part.

The agricultural areas comprise the Perth, South-West, Upper Great Southern, Lower Great Southern and Midlands Statistical Divisions and the Sub-divisions of Dundas and Greenough. The pastoral areas comprise the Kimberley and Pilbara Divisions and the Sub-divisions of Lefroy, Gascoyne and Carnegie.

CLASSIFICATION OF AGRICULTURAL ESTABLISHMENTS  
ACCORDING TO SIZE OF ESTABLISHMENT: SEASON 1979-80

Area of establishments	In agricultural areas		In pastoral areas		Whole State	
	Number of establishments	Area	Number of establishments	Area	Number of establishments	Area
hectares		hectares		hectares		hectares
(a) 0		—	1	—	134	—
1 — 4	4	1,026	30	87	1,056	2,833
5 — 9	9	585	71	491	656	4,374
10 — 19	19	549	49	658	598	8,205
20 — 29	309	7,290	21	448	330	7,738
30 — 39	236	8,030	5	168	241	8,198
40 — 49	439	18,746	2	80	441	18,826
50 — 74	634	39,266	4	250	638	39,516
75 — 99	515	44,220	2	176	517	44,396
100 — 124	453	50,715	2	218	455	50,933
125 — 149	369	50,418	—	—	369	50,418
150 — 199	594	102,793	3	541	597	103,334
200 — 249	577	128,036	3	673	580	128,709
250 — 299	426	116,548	1	273	427	116,821
300 — 399	674	233,132	2	759	676	233,891
400 — 499	726	321,769	4	1,804	730	323,573
500 — 749	1,323	822,180	3	1,728	1,326	823,908
750 — 999	1,429	1,236,902	5	4,348	1,434	1,241,250
1,000 — 1,999	3,874	5,541,816	11	15,302	3,885	5,557,118
2,000 — 2,999	1,543	3,720,912	1	2,605	1,544	3,723,517
3,000 — 3,999	665	2,283,151	2	6,676	667	2,289,827
4,000 — 4,999	278	1,229,361	1	4,028	279	1,233,389
5,000 — 9,999	290	1,862,851	4	28,250	294	1,891,101
10,000 — 19,999	35	432,231	5	71,962	40	504,193
20,000 — 29,999	4	91,409	6	152,502	10	243,911
30,000 — 49,999	9	366,124	14	580,054	23	946,178
50,000 and over	24	4,747,797	424	90,579,269	448	95,327,066
Total	17,719	23,469,873	676	91,453,350	18,395	114,923,223

(a) Comprises beekeepers without land.

In the next table details of rural land utilisation according to statistical division are given for 1979-80. The statistical divisions (and their component local government areas) were revised with effect from 1 January 1976. Maps showing the boundaries of the statistical divisions appear inside back cover.

LAND UTILISATION IN EACH STATISTICAL DIVISION: 1979-80

Statistical division	Land use during the season (hectares)					Total area of establishments (hectares)
	Active agricultural establishments (number)	Used for crops (a)	Under sown pastures	Lucerne (all purposes)	Other	
Perth	2,454	6,773	68,806	184	45,996	121,759
South-West	3,593	41,076	727,781	908	149,923	919,688
Lower Great Southern	2,980	512,774	1,632,458	755	730,038	2,876,025
Upper Great Southern	2,338	953,032	1,471,290	121	923,520	3,347,963
Midlands	4,161	2,459,899	1,881,343	160	2,873,087	7,214,489
South-Eastern	870	270,508	670,398	6,565	16,750,333	17,697,804
Central	1,777	1,031,695	673,787	2	40,386,450	42,091,934
Pilbara	75	5	—	—	15,521,885	15,521,890
Kimberley	147	4,113	6,663	5	25,120,890	25,131,671
Total	18,395	5,279,875	7,132,526	8,700	102,502,122	114,923,223

(a) Excludes areas of sown pastures and of lucerne cut for hay or harvested for seed.

## AGRICULTURE

### Wheat

Although wheat has been grown from the earliest years of settlement, cultivation was confined to limited areas as late as 1890 when, of a total area of approximately 14,000 hectares,



about one-third was located in the Toodyay-Northam area of the Avon Valley, about one-quarter in the Geraldton-Greenough district and a similar area in the York-Beverley region, with lesser areas at Williams and at places in what is now the South-West Statistical Division. During the 1890s, however, substantial development took place as a result of extensions to the Great Southern and Eastern Railways and the completion of the line from Midland Junction to Walkaway, and by 1910 wheat farming was being carried out in widespread areas in the southern part of the State and as far east as the Merredin district, an area with an average annual rainfall of only 330 millimetres. An outstanding factor in this development was the introduction and increasing use of phosphate fertiliser (superphosphate) to correct the widespread phosphorous deficiency of the wheat belt soils of Western Australia.

The decline in gold production which began in 1904 reduced employment in mining and caused people in increasing numbers to take up agricultural land. This contributed to a spectacular growth in wheat farming and 702,000 hectares were sown to wheat for grain in 1915 compared with 79,000 hectares ten years earlier. The first World War caused a serious reduction in area sown but recovery was fairly rapid from 1920, and by 1925 the area sown for grain had risen to more than 850,000 hectares.

Following the war, a policy of expanding land settlement was resumed. A soldiers' settlement scheme was initiated and a large-scale programme of assisted immigration, with financial aid provided by the British, Commonwealth and State Governments, was inaugurated. With adequate finance available, greater technical efficiency and a buoyant market for wheat, the area sown for grain increased threefold between 1920 and 1930. Among the technical advances contributing to the increase were the introduction of tractors and the development by the Department of Agriculture of early-maturing and drought and disease resistant wheat varieties.

Because of the relatively low yield, mechanisation was of great significance in the growth of wheat farming in Western Australia, but other aspects of the industry received early consideration and experimental farms were established by the Department of Agriculture in areas where particular difficulties were encountered. As a result, special wheat strains have been developed and farming techniques improved. An extensive programme of soil research and classification has been carried out by the Department and has revealed several mineral deficiencies which it has been possible to correct by the addition of trace elements, notably copper and zinc to standard fertilisers. Experiments have also been made on methods of soil conservation in those areas which are subject to wind or water erosion, and some success has been achieved by the planting of certain grasses and fodder crops and by contour ploughing and the use of contour banks.

In 1930, an area of 1,601,000 hectares was sown for grain and produced a previously unsurpassed total harvest of 1,456,000 tonnes, which was not exceeded until 1958. Low prices subsequently caused a decline in area sown to 1,028,000 hectares in 1935, but by 1938 the total had risen to 1,381,000 hectares for a yield of 1,003,000 tonnes. The sowing of wheat for grain was reduced during the second World War to one-half of the pre-war level, only 613,000 hectares being sown in 1944. In the immediate post-war years it steadily increased and by 1950 had risen to 1,289,000 hectares. Over the next six years it declined slightly, the smallest area sown in that period being 1,119,000 hectares in 1956. Significant increases occurred in each of the following three years and in 1959 the area sown was 1,505,000 hectares. Except in 1946 and 1969, when the average yield per hectare was only 0.66 tonnes, seasonal conditions in the post-war years have generally been favourable and good yields have been maintained. In 1955 a record average yield to that date of 1.24 tonnes was obtained from 1,169,000 hectares, the total production being 1,449,000 tonnes or only 7,000 tonnes less than the 1930 harvest which was produced from an area 431,000 hectares greater in extent. Between 1956 and 1967, areas and production followed a generally increasing trend and by 1968, the area of land sown to wheat for

grain had increased to 3.0 million hectares from which a harvest of 3.1 million tonnes was obtained for an average yield of 1.04 tonnes per hectare. With the introduction of the Wheat Delivery Quotas Plan in 1969 the area sown to wheat decreased by over 900,000 hectares between 1968-69 and 1971-72. The downward trend was arrested in 1972-73 when quotas were raised and 2.4 million hectares were sown. The area sown further increased to 3.7 million hectares in 1978-79 from which a State record harvest of almost 4.4 million tonnes was obtained at an average yield of 1.19 tonnes per hectare.

WHEAT FOR GRAIN — AREA AND PRODUCTION

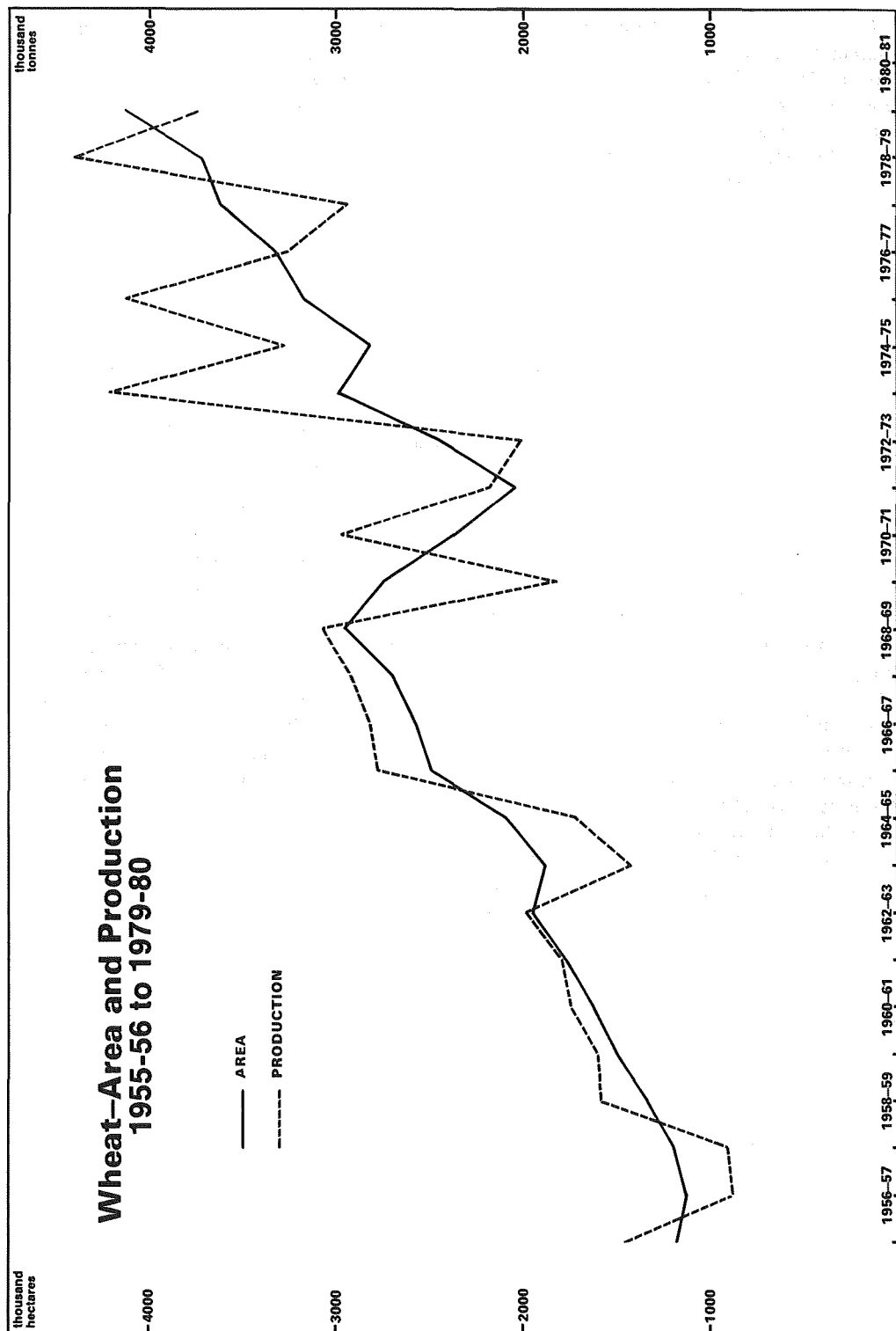
Season	Area sown	Production		
		Total	Average yield per hectare	Gross value
	hectares	tonnes	tonnes	\$
1900-01	29,947	21,092	0.70	309,862
1910-11	235,527	160,517	0.68	2,162,432
1920-21	516,379	333,336	0.65	11,023,272
1930-31	1,600,938	1,456,141	0.91	12,201,176
1940-41	1,062,301	573,159	0.54	8,647,906
1950-51	1,288,925	1,358,056	1.05	65,328,246
1960-61	1,627,242	1,739,074	1.07	92,290,238
1970-71	2,361,146	2,956,969	1.25	153,226,816
1974-75	2,809,883	3,277,071	1.17	361,210,674
1975-76	3,171,289	4,122,011	1.30	427,507,019
1976-77	3,313,942	3,248,780	0.98	290,488,533
1977-78	3,608,871	2,945,461	0.82	292,862,760
1978-79	3,705,610	4,399,520	1.19	546,827,309
1979-80	4,120,784	3,739,139	0.91	571,157,979

**Size Classification of Wheat Farms.** In 1965-66, of the 22,853 agricultural establishments of all types in the State, wheat for grain was grown on 9,267 or 40.6 per cent of the total. For 1968-69, the percentage decreased slightly to 40.1 per cent. In 1974-75 wheat for grain was grown on 7,899 or 38.5 per cent of the 25,500 agricultural establishments of all types in the State.

Of the 18,395 agricultural establishments of all types in the State in 1979-80, wheat for grain was grown on 7,874 or 42.8 per cent of the total. Establishments growing between 1 and 399 hectares of wheat for grain accounted for 54 per cent of the establishments but only 18 per cent of the total area, whereas establishments growing 400 or more hectares accounted for only 46 per cent of establishments but 82 per cent of the total area sown to wheat for grain.

ESTABLISHMENTS GROWING WHEAT FOR GRAIN  
CLASSIFIED ACCORDING TO AREA SOWN  
SEASON 1979-80

Area of wheat for grain	Number of establishments	Total area sown to wheat for grain
hectares		hectares
1 — 9	138	649
10 — 19	161	2,152
20 — 29	144	3,339
30 — 39	104	3,442
40 — 49	177	7,557
50 — 74	290	17,513
75 — 99	275	23,352
100 — 149	587	71,012
150 — 199	486	82,596
200 — 249	643	140,751
250 — 299	443	120,666
300 — 399	792	269,145
400 — 499	773	336,402
500 — 749	1,089	662,401
750 — 999	633	539,122
1,000 — 1,499	663	790,747
1,500 and over	476	1,049,938
Total	7,874	4,120,784



**Wheat Varieties.** Information on wheat varieties is now collected on a triennial basis. Of 3,728,233 hectares sown to wheat in 1978-79 (latest information available) whether for grain, hay or green fodder, 1,900,469 or 51.0 per cent were sown to Gamanya. The next most popular variety of wheat, in terms of area sown, was Madden with 485,595 hectares or 13.0 per cent of the total. These are both high quality bread varieties suitable for the Australian Standard White (ASW) and Australian Hard grades of wheat.

**Bulk Handling of Wheat.** The rapid increase in the production and export of wheat between 1910 and 1920 caused problems of transport and storage, and proposals for the bulk handling of the grain led to the formation of a company for this purpose in 1920. This original undertaking was wound up before commencing operations because the technical difficulties then appeared too great and the saving in handling costs problematical. In the early 1930s depressed wheat prices once again stimulated the search for cheaper methods of storage and transportation of grain. Experiments were carried out in the Wyalkatchem area during the 1931-32 season which essentially involved the adaptation of existing bagged wheat storages and bagged wheat mobile elevators to handle wheat in bulk.

The experiment proved successful and the Bulk Handling Act of 1935 gave a growers' co-operative the right of operating, under franchise, a bulk handling system. The co-operative company was Co-operative Bulk Handling Limited which had been formed in 1933, the initial capital being subscribed by two existing co-operatives, Westralian Farmers Co-operative Limited and The Grain Pool of W.A. In founding Co-operative Bulk Handling Limited these two organisations had provided that as soon as the system was established and the initial liability repaid, ownership and control would be passed to the users of the system.

With its present toll system of operation Co-operative Bulk Handling Limited essentially conforms to the Rochdale principles of co-operation. The grower delivering grain to the Company pays a toll on each tonne delivered. For the first \$2 of toll, he receives one ordinary share in the company, which must be returned to the company if he ceases to deliver grain. For the remainder of his tolls he receives a debenture repayable in full over a ten-year cycle. The tolls are used for capital expenditure and for the repayment of previous tolls summarised into debentures. The toll system thus creates a revolving capital fund subscribed by the growers actually using the system, and in turn achieves perpetual and complete user-ownership. Each user of the system receives a share but only one share. He cannot accumulate any additional shares and thus has only one vote.

By 1943 the original construction programme had been completed and all debts repaid. At this time the decision was made to hand the system over to the growers to enable them to control and direct future expansions for their own benefit.

To the outbreak of the second World War and beyond, the company continued its policy of expansion and modernisation. Services to off-line receival points were begun in the 1940-41 season and in 1951 growers of oats and barley requested that the co-operative include these grains in its system. Since then the company has stored and transported up to eight grain types in many varieties and grades. Laboratory and sampling techniques have been extended, ensuring high quality control and a continued effort to meet marketing requirements. In addition Co-operative Bulk Handling Limited provided and operates transfer depots for handling grain from narrow gauge to standard gauge railway wagons at Merredin, Midland and Northam. The depots are concrete vertical silo systems and between them handle all the grain destined for shipment through the Kwinana terminal which handles something more than half the total receivals.

In the 1960s, Co-operative Bulk Handling Limited commenced a modernisation programme of its country receival points. Original receival points were conceived in the era of horse-drawn transport and were spaced about eleven kilometres apart. Motor transport and better roads meant that a thirty-two-kilometre spacing would be adequate, while the mechanisation of

farming and the improvement of farming techniques indicated a large size of storage was required. The modernisation programme has involved the progressive replacement of the older bins, permanent roofed bulkheads and open bulkheads with horizontal storages built of either concrete or steel and equipped with integrated handling machinery, or provision for such machinery to be installed at a later date.

In addition to country receival points storage, Co-operative Bulk Handling Limited provided and operates terminal depots for bulk wheat shipments at Albany, Bunbury, Esperance, Geraldton and Kwinana. The modern deep-draught bulk loading terminal at Kwinana which comprises vertical cell and horizontal storage facilities, ship docking and loading facilities and administration block is reputed to form the world's largest single grain-shipping complex.

Grain is delivered to the terminal in specially designed hopper-bottom rail trucks which discharge their load through long grids inlaid between the rail tracks. Belt conveyors beneath the tracks then take the grain to elevators which are used to direct it into one of two horizontal storage units, which have a total capacity of 700,100 cubic metres, or the vertical cells, which have a capacity of 519,000 cubic metres. Facilities for grain cleaning, dust control, fumigation and quality control are incorporated within the complex to ensure fast, hygienic handling of grain. The computerised control system installed in the terminal monitors stock records and grain flows at all times.

Outloading of grain involves transfer from the storage facilities to the shipping gallery along four conveyor belts, which have a combined outloading capacity of 5,000 tonnes per hour. The shiploading gallery and jetty, in conjunction with the main cell blocks began operating in June 1977.

At 31 December 1980, storage capacity in the country was 8,135,000 cubic metres and at the ports 2,633,500 cubic metres. The latter figure includes the total storage capacity at Kwinana. The initial storage constructed in 1931 provided for 23,276 cubic metres. The largest seasonal production that Co-operative Bulk Handling Limited has handled was 6,960,400 cubic metres of all grains in the 1978-79 season. By contrast, in the initial season the system handled 46,000 cubic metres.

**Marketing of Wheat.** The Australian Wheat Board is the sole authority for the marketing of wheat within Australia and of wheat and flour for export. The Board derives its authority from the *Wheat Marketing Act* 1979 established under joint Commonwealth and State legislation which repeals the *Wheat Industry Stabilization Act* 1974 (Commonwealth) and applies to the season which commenced on 1 October 1979, and each of the next six succeeding periods of 12 months.

With the introduction of the new Act a Guaranteed Minimum Delivery Price will replace the first advance payment of previous years. The GMDP will guarantee growers a minimum price of 95 per cent of the average of net pool returns of the current year and the two preceding years converted to a net basis. Movements in the GMDP from one season to the next will be limited to 15 per cent.

A wheat finance fund has been established with a ceiling of \$100 million; moneys held in the previous Stabilization Fund have been transferred to the new fund and growers will be levied \$2.50 per tonne.

**Home Consumption Price of Wheat.** The legislation provides that the basic class of wheat to be marketed by the Board is 'Australian Standard White' which means wheat other than —

- (a) wheat that, having regard to its general characteristics, is classified by or on behalf of the Board, for the purposes of this interpretation, as being included in a particular category of wheat; or
- (b) wheat that is classified by or on behalf of the Board, for the purposes of this interpretation, as having a quality defect;

For the year commencing 1 December 1979 or any of the four succeeding years the Commonwealth Minister for Primary Industry is required by the *Wheat Marketing Act 1979*, after consultation with the appropriate Minister in each State, to fix a price per tonne for wholesale sales in Australia by the Board for each year, of Australian Standard White wheat in bulk, free on rail at a port of export.

The *Wheat Marketing Act 1979* also requires the Commonwealth Minister for Primary Industry to fix the price for Human Consumption in respect of a year in the above-mentioned five year period by —

- (a) taking as a basis an amount of \$127.78 per tonne for the first season.
- (b) making such adjustments for succeeding seasons by using the formula included in the Schedule to the Act.

There shall be added to the above by the Minister in consultation with the Board an amount that is considered necessary to enable the Board to meet the costs of shipment of wheat to a port in Tasmania.

The price for Australian Standard White wheat for stockfeed and industrial use is to be determined from time to time by the Board in respect of the relevant use.

The Home Consumption price for the 1979-80 season was fixed at \$130.78 per tonne. The Human Consumption price for 1980-81 season was \$156.12 per tonne.

**Wheat Standards.** The Western Australian Wheat Standards Committee establishes standards for Australian Standard White (W.A.) wheat and Australian Hard (W.A.) wheat. The procedure approved for determining these standards of wheat provides for samples being drawn progressively at each country receival point and port of shipment during the harvest period. After all samples are assembled they are sorted into zones of origin (Geraldton, Fremantle, Bunbury, Albany and Esperance), the zones being fixed in relation to each siding's natural port terminal. Each zone is then taken separately, the samples from the sidings in the zone being bulked together and thoroughly mixed and it is from these mixtures that each zone's contribution to the main bulk sample for the State is drawn.

Zone contributions are then bulked together and thoroughly mixed, after which ten weighings are taken on a Schopper one-litre scale chondrometer and from the average of those weighings the standards for the season are declared. Subsequently, the wheat is subjected to mechanical and quality tests.

Official standard samples are widely distributed to commercial interests and appropriate Government Departments and instrumentalities both locally and overseas, as being representative of the wheat of the particular season which is on offer to the world grain markets.

**Wheat Delivery Quotas Plan.** The Australian Wheat Grower's Federation put forward proposals, in March 1969, for the allotment of quotas on deliveries of wheat to the Australian Wheat Board. The Federation's proposals were mainly designed to bring marketable supplies of wheat more into line with available outlets, following the record Australian and State harvests in 1968-69. The proposals, which first became effective for the 1969-70 harvest, established for Western Australia a quota of 2.3 million tonnes for deliveries of wheat for that season.

State Governments have the responsibility of implementing the quota plan within the States and separate enabling legislation has been enacted in each State. Particulars of the statutory provisions relating to the establishment in Western Australia of a quota scheme with respect to the delivery and marketing of wheat, are contained in the Wheat Delivery Quotas Act which provided for the establishment of a Wheat Quotas Committee of three members appointed by the Minister for Agriculture. Subject to the direction of the Minister, the Committee is empowered under the Act to determine individual quotas for growers, but quotas may be reviewed by the Minister at any time.

For the season 1973-74 the State's allocation was set at 3.1 million tonnes. However, complementary State and Commonwealth legislation provided that the Australian Wheat Board 'may have regard to the possibility that the Australian wheat quota originally determined for that season, may be increased by a quantity not exceeding 544,311 tonnes'.

All wheat accepted as 'quota wheat' is the subject of normal Australian Wheat Board payments within the framework of the Wheat Industry Stabilization Act.

The 1975-76 season was declared a non-quota season by the Commonwealth Minister for Primary Industry and consequently there was no restriction whatsoever on the quantity of wheat which a grower might deliver. However, the State Minister for Agriculture approved a recommendation to maintain a base quota (for possible use in subsequent seasons) for individual properties.

All the seasons since 1975-76 have been declared non-quota years with the continuation of the guide-lines of adjusting individual base quota records by adding to 80 per cent of the previous years figure 20 per cent of the wheat delivery made.

Further details of the State's wheat quotas and of the method of allocation are given on pages 346-7 of the *Western Australian Year Book*, No. 17 — 1979.

### Exports of Wheat

#### EXPORTS OF WHEAT AND FLOUR

Year	Wheat	Flour (a)	Estimated total wheat equivalent
	tonnes	tonnes	tonnes
1929-30	679,116	62,659	767,466
1939-40	417,226	83,159	534,344
1949-50	585,417	105,065	733,558
1959-60	999,173	79,697	1,111,546
1969-70	1,814,774	31,173	1,858,727
1974-75	3,241,895	19,281	3,269,081
1975-76	3,215,792	11,658	3,232,230
1976-77	3,009,101	11,355	3,025,112
1977-78 (b)	3,795,969	7,888	3,807,091
1978-79 (b)	2,208,985	6,146	2,217,651
1979-80 (b)	4,205,774	4,342	4,211,896

(a) Ships' stores are excluded from figures for 1959-60 and subsequent years. (b) Excludes interstate details.

Most of Western Australia's wheat production is exported as grain and flour and in the above table the fluctuations which have occurred in exports since 1929 are shown, together with figures giving the estimated total wheat equivalent. Prior to the early 1970s the United Kingdom had been a most consistent purchaser of the State's wheat but, since 1973-74 no exports to the United Kingdom have been recorded. Since 1961-62 China, excluding Taiwan Province, and Japan have been the most important customers and in 1969-70 their purchases together accounted for 78 per cent of the State's total wheat exports. In 1979-80 their combined purchases were 37 per cent of the State's total exports, China, excluding Taiwan Province being the most important customer with purchases amounting to 967,760 tonnes. In 1979-80 principal buyers (other than China, excluding Taiwan Province), in order of importance, were Japan, Iran, Indonesia and the Union of Soviet Socialist Republics. In the same year the principal customer for flour was Mauritius. Further details of exports appear in Chapter IX, Part 1.

### Oats

Although oats have been grown in Western Australia since the early development of wheat farming, cultivation was somewhat limited until stimulated by the introduction of large-scale sheep raising in the agricultural areas, when their high nutritional worth as stock feed made

them a very valuable crop. The area sown to oats for grain increased from 78,301 hectares in 1920 to a peak of 538,153 in 1960. It then remained reasonably static until 1972 when the area sown to oats fell to 296,666 hectares. The fluctuations which have occurred in the area sown to oats for grain in recent years are shown in the table below.

Locally bred varieties of oats feature prominently in the industry. West and Swan, which are both high yielding varieties, are sown on about 75 per cent of the area. A new variety, Moore, better suited to the wetter Western Districts where it out-yields both West and Swan, was released in 1978.

In addition to their importance as local stock feed, oats are exported in substantial quantities. In 1979-80 the total sold overseas was 121,089 tonnes, the principal buyers being Japan, Malaysia, the United Kingdom, the Republic of Philippines and Greece.

Although growers are free to market oats in any way they wish, in practice a large proportion of all sales, whether for export or the local market, is effected through the Western Australian State Voluntary Oats Pool, which is conducted by The Grain Pool of W.A. On 28 November 1975, oats became an 'approved grain' under the provisions of the *Grain Marketing Act 1975*. This meant that all oats delivered to Co-operative Bulk Handling Limited were deemed to have been received on behalf of the Grain Pool of W.A. However, since 31 October 1980 oats ceased to be an 'approved grain' and a 'warehousing' system was introduced.

OATS FOR GRAIN — AREA AND PRODUCTION

Season	Area	Production		
		Total	Average yield per hectare	Gross value
	hectares	tonnes	tonnes	\$
1974-75	262,347	249,526	0.95	18,044,683
1975-76	319,877	385,670	1.21	32,700,101
1976-77	372,299	347,396	0.93	28,906,170
1977-78	414,978	415,645	1.00	31,100,021
1978-79	427,494	490,884	1.15	30,318,712
1979-80	369,553	399,272	1.08	28,817,147

## Barley

Barley grows well over a wide range of climatic and soil conditions and generally yields better than other cereals. It is successful on saline soils where other crops may not do well and as a first crop on newly-developed land. With the introduction of wheat delivery quotas, and because barley was a suitable alternative crop, the area of barley sown for grain rose to a record 911,318 hectares in 1971-72 but the relaxation of wheat quotas in the following years caused a contraction in the area sown to barley.

Both 'two-row' and 'six-row' barley are grown and, while a large amount of the grain produced is retained on farms for stock feed, the bulk of the crop is now exported. In 1979-80 the quantity exported overseas was 574,311 tonnes, the principal buyers being the Union of Soviet Socialist Republics and Japan. For many years sales of 'two-row' barley were mainly to local maltsters. However, since 1968-69 exports of 'two-row' barley have become increasingly important. Most 'six-row' barley sold continues to be marketed overseas.

Clipper variety barley is recommended for all areas for producing 'two-row' malting, manufacturing and feed grades of barley. Alternative acceptable varieties are Dampier for 'two-row' manufacturing and feed and the Beecher variety for 'six-row' feed. Dampier is lower yielding than Clipper in most areas and is not sought by overseas markets to the same extent as Clipper.

Forrest variety was registered in 1980 for release as a feed barley for farmers in south coastal areas. It is scald, net blotch and mildew resistant with markedly reduced head loss in comparison to Clipper. It out-yields Clipper in extensive areas of the State.



The Grain Pool of W.A. is the sole marketing authority for barley in Western Australia and is responsible for the marketing of barley for both export and local consumption in accordance with the *Grain Marketing Act 1975*. The licensed receiver for the Grain Pool is Co-operative Bulk Handling Limited.

#### BARLEY FOR GRAIN — AREA AND PRODUCTION

Season	Two-row				Six-row			
	Area	Production		Gross value	Area	Production		Gross value
		Total	Average yield per hectare			Total	Average yield per hectare	
	hectares	tonnes	tonnes	\$	hectares	tonnes	tonnes	\$
1974-75	305,463	251,931	0.82	25,857,060	81,535	77,125	0.95	7,964,457
1975-76	332,269	411,481	1.24	43,085,870	86,716	93,521	1.08	9,313,348
1976-77	375,504	489,946	1.30	54,317,574	76,797	63,143	0.82	6,592,506
1977-78	531,267	705,252	1.33	65,680,491	82,356	46,013	0.56	3,790,602
1978-79	544,032	697,685	1.28	62,238,917	72,316	80,758	1.12	6,902,476
1979-80	466,582	582,668	1.25	69,012,941	56,273	48,976	0.87	5,165,890

#### Lupins

The large-scale growing of lupins for processing has been undertaken in Western Australia from about 1971-72, mainly in the areas from Geraldton to Watheroo and from Bridgetown to Kojonup, although in later years, with the development of new strains, growing has spread into drier parts of the wheat belt. The industry is based largely on white-seeded, white-flowered varieties of the narrow-leaved lupin (*Lupinus angustifolius*). The main varieties remain Marri and Unicrop, but they are starting to be replaced by Illyarrie (released 1979) and Yandee (released 1980), both of which combine the early maturity of Unicrop with the disease resistance of Marri. The Ultra variety of the White lupin (*L. albus*) which was released in 1976 for growing on loamy soils, has yet to be proved commercially. Severe drought conditions since 1976-77 in the main lupin growing areas have continued to restrict both the area sown and the yield of lupins.

#### LUPINS FOR GRAIN — AREA AND PRODUCTION

Season	Area	Production		Gross value
		Total	Average yield per hectare	
	hectares	tonnes	tonnes	\$
1974-75	118,607	77,151	0.65	6,435,041
1975-76	121,877	88,710	0.73	7,889,774
1976-77	95,840	23,323	0.24	2,380,958
1977-78	57,343	23,616	0.41	2,701,087
1978-79	39,046	23,789	0.61	3,867,781
1979-80	46,184	25,192	0.55	3,364,215

Prior to 1974-75, marketing of lupins for processing was conducted through a voluntary pool operated by The Grain Pool of W.A. In that year the Western Australian Seed Board took over the marketing through a compulsory pool, with the Grain Pool acting as managing and selling agents and Co-operative Bulk Handling Limited acting as licensed receivers. Since November 1975, under the provisions of the *Grain Marketing Act 1975* the Western Australian Seed Board has been disbanded and marketing of lupins (except receival) is now entirely the responsibility of The Grain Pool of W.A.

#### Other Grains

The introduction of the Wheat Delivery Quotas Plan in 1969-70 effectively limited the quantity of wheat which could be delivered to the Australian Wheat Board. This caused producers to look for alternative cash crops and considerable interest was shown in rape seed production. The area sown to rape expanded rapidly to a peak of 41,566 hectares in 1972-73 but in that season the average yield dropped to 0.21 tonnes per hectare due to the spread of

blackleg disease. Consequently the area planted to rape fell dramatically in 1973-74 to 2,225 hectares. Future production will depend on the availability of disease-resistant strains of rape. The first blackleg resistant variety released for sowing was Wesreo in 1978. Wesroona and Wesbell were released in 1980. These high yielding varieties of rape (*Brassica napus*) combine good resistance to blackleg disease with high quality seed. Wesroona has a low glucosinolate level which makes the meal more acceptable for stock feeds.

Low erucic acid rape seed varieties are preferred on local and overseas markets. Currently a maximum of 5 per cent erucic acid is fixed as the acceptable level for receipt into the statutory pool conducted by The Grain Pool of W.A.

#### RAPE SEED — AREA AND PRODUCTION

Season	Area	Production		
		Total	Average yield per hectare	Gross value
	hectares	tonnes	tonnes	\$
1974-75	2,170	768	0.35	125,224
1975-76	3,678	1,830	0.50	299,110
1976-77	949	855	0.90	145,534
1977-78	1,346	1,474	1.10	294,302
1978-79	1,952	991	0.51	208,778
1979-80	3,918	2,275	0.58	504,614

The area sown to linseed is small although the yield and quality is sound. Tests carried out have indicated that Western Australian linseed compares favourably with the top North American grades.

Linseed marketing is statutorily controlled and is the responsibility of The Grain Pool of W.A. In recent years only small quantities of linseed have been produced.

Grain sorghum, rye, field peas, vetches and safflower are also grown but only in small quantities. However, considerable interest is being shown in producing sunflower seed in the Ord River region. In 1979-80 1,812 hectares were reported as sown to sunflower in this region, compared to 599 hectares in 1978-79. Correspondingly, production of sunflower seeds increased from 452 tonnes in 1978-79 to 2,412 tonnes in 1979-80 — this constituted 95.3 per cent of the recorded production for the State.

#### Hay

#### HAY — AREA AND PRODUCTION

Season	Pasture		Oaten		Wheaten		Other (a)		Total	
	Area	Production	Area	Production	Area	Production	Area	Production	Area	Production
	hectares	tonnes	hectares	tonnes	hectares	tonnes	hectares	tonnes	hectares	tonnes
1974-75	89,143	287,156	52,880	160,415	15,477	40,948	6,123	19,842	163,623	508,361
1975-76	80,126	253,012	60,229	212,067	16,803	51,555	6,171	19,843	163,329	536,477
1976-77	74,125	240,893	70,011	247,958	20,129	55,700	5,032	15,880	169,297	560,431
1977-78	82,670	267,254	80,419	258,300	23,452	53,997	4,565	17,043	191,106	596,594
1978-79	77,623	243,974	81,153	270,192	20,976	57,237	4,090	14,416	183,842	585,819
1979-80	92,530	295,240	87,546	270,051	22,839	56,122	4,779	15,012	207,694	636,425

(a) Mainly barley, vetch, lucerne, rye, lupins and rape hay.

Large quantities of pasture hay are cut from clover and grass pastures, production in 1979-80 being 636,425 tonnes from 207,694 hectares. The principal cereal hay crop is oats and 270,051 tonnes of oaten hay were cut in 1979-80 from 87,546 hectares. Wheat is the only other cereal crop which is used extensively for this purpose and in 1979-80 the production was 56,122 tonnes from 22,839 hectares. Barley, vetches, lucerne, rye, lupins and rape are also used for hay making but they are of minor importance only.

## Pastures

The first established pastures in the State were cultivated to provide grazing for dairy cattle but, with the rapid increase in the number of sheep carried on wheat farms, by far the greater area is now located in the wheat-growing districts.

Subterranean clover was one of the first pasture species sown in these districts and it is still the most important, although other clovers, medics and a variety of grasses including Wimmera rye grass and perennial rye grasses are also grown extensively. The present practice in the higher-rainfall areas is to sow a mixture of two or more species, selected for their suitability to the type of soil and rainfall, to give a legume-grass pasture.

From 0.8 million hectares in 1945-46, the area under sown pasture increased remarkably to 7.8 million hectares in 1974-75. The top-dressing of pastures with superphosphate has developed to such an extent that this treatment is now general practice.

In the decade from the mid 1960s considerable areas of new land were cleared, much of it along the south coast where the growing season is six or seven months. It has been found that if heavier seed and fertiliser applications are used, good subterranean clover seed crops can be grown in the first year on this new land. Similarly, in more inland districts good yields of annual medics can be obtained on suitable soil types. The paddocks generally being used are large, open and only gently undulating, and are thus suitable for the operation of modern harvesting machines. Very little, if any, rain falls in the summer months and this ensures ideal harvesting conditions.

The development of suction harvesting machines in recent years has enabled this potential to be exploited. Suction harvesters are now used to harvest most of the more important small-seeded legume crops (subterranean clover, barrel medic and rose clover).

Seed certification schemes are operated by the Department of Agriculture for the main species of pasture seed. These schemes ensure that buyers are in a position to obtain good quality seed of the cultivar they require free from undesirable weed seeds. Certification schemes have assisted greatly in marketing and in allowing the development of a sound export trade.

There is an important export trade in subterranean clover seed and in 1979-80 the total exported was 1,423,316 kilograms, over 91 per cent of which went to other Australian States.

### PASTURE SEED HARVESTED

Season	Principal pasture seed								Total pasture seed (a)
	Subterranean clover		Lupins		Barrel medic		Wimmera rye grass		
	Area harvested	Pro- duction	Area harvested	Pro- duction	Area harvested	Pro- duction	Area harvested	Pro- duction	Area harvested
	hectares	kilograms	hectares	kilograms	hectares	kilograms	hectares	kilograms	hectares
1974-75	13,551	3,061,614	3,911	1,004,756	1,842	195,288	1,045	130,648	22,878
1975-76	7,201	1,559,513	2,362	613,508	862	104,298	308	50,581	12,514
1976-77	11,231	2,305,656	n.a.	n.a.	1,009	121,924	179	45,727	(b) 13,603
1977-78	11,046	2,311,822	673	157,460	699	85,180	521	76,482	13,262
1978-79	14,284	2,936,398	596	122,417	2,017	245,802	227	33,287	18,151
1979-80	24,743	4,618,985	1,665	232,216	758	82,450	135	12,940	27,955

(a) Includes lucerne harvested for seed.

(b) Incomplete.

## Crops for Green Feed

Large areas of oats are grown for use as green feed for stock. Among other crops which are cultivated for this purpose, but to a far lesser extent, are lupins, barley, wheat, field peas, rye and forage sorghum.

### CROPS FOR GREEN FEED — AREA GRAZED OR CUT (Hectares)

Season	Oats	Lupins	Barley	Wheat	Field peas	Forage sorghum	Rye	Other (a)	Total
1974-75	51,468		12,795	5,417	2,085	1,271	1,175	1,270	75,481
1975-76	49,350	n.a.	10,538	5,849	1,727	720	394	1,461	70,039
1976-77	48,286		7,551	5,969	1,735	638	541	1,377	66,097
1977-78	55,093	8,815	7,853	6,188	1,717	671	833	1,185	82,355
1978-79	51,927	5,207	7,937	1,647	1,777	1,099	1,320	988	71,902
1979-80	54,814	4,764	10,596	4,613	2,548	970	1,118	809	80,232

(a) Mainly vetches, millet, grain sorghum and maize.

### Potatoes

The cultivation of potatoes, the State's principal vegetable crop, is confined largely to the higher-rainfall areas of the south-west. Winter crops are planted during June and early July on the frost-free hillsides and drained flats of the coastal areas between Waroona and Donnybrook and on the market garden land in the Perth Statistical Division. Mid-season plantings are made during August to November on sprinkler-irrigated land in the Manjimup area. Late crops are planted between mid-November and the end of February in all districts growing early or mid-season crops, other than the Perth Statistical Division.

The average yield of potatoes per hectare in Western Australia is consistently greater than that for Australia as a whole, and in 1979-80 comparative yields were 32.46 tonnes and 23.39 tonnes per hectare. This is due mainly to the favourable climatic conditions in Western Australia and the use of sprinkler irrigation. Delaware, the principal variety grown in the State, gives high yields under a wide range of growing conditions. There is a substantial export surplus, the bulk of which in 1979-80 went overseas, principally to the Republic of Singapore with smaller consignments being sent to the other Australian States.

Potato production in Western Australia is controlled, under the provisions of the *Marketing of Potatoes Act 1946-1974*, by the Western Australian Potato Marketing Board, which is the sole marketing authority for potatoes produced in the State. The object of this provision is to ensure adequate supplies for local consumption and effective marketing of crops.

### POTATOES — AREA AND PRODUCTION

Season	Area	Production		
		Total	Average yield per hectare	
			tonnes	Gross value \$
	hectares	tonnes	tonnes	
1974-75	2,356	67,450	28.63	8,805,596
1975-76	2,308	68,033	29.48	12,320,496
1976-77	2,347	70,943	30.23	11,247,158
1977-78	2,066	53,289	25.79	9,532,000
1978-79	2,039	62,572	30.69	12,875,468
1979-80	2,039	66,184	32.46	14,838,609

### Onions

The production of onions is confined largely to the metropolitan and adjacent areas, Spearwood being the main centre. In these districts onions are usually grown on light sandy soils and yields of up to 50 tonnes per hectare are obtained. Over the last decade the area of onions planted has been steadily increasing. The area planted in 1979-80 was a record 220 hectares. The previous record area sown (206 hectares) was in 1962-63.

Onions are imported annually into Western Australia during the winter but a surplus is produced locally during summer months and is exported, in the main, to overseas markets, the most important being the Republic of Singapore.

## ONIONS — AREA AND PRODUCTION

Season	Area	Production		
		Total	Average yield per hectare	Gross value
	hectares	tonnes	tonnes	\$
1974-75	157	6,236	39.72	1,024,751
1975-76	175	7,194	41.11	1,220,766
1976-77	190	7,863	41.38	1,341,994
1977-78	189	8,013	42.40	1,528,574
1978-79	189	8,035	42.51	2,324,069
1979-80	220	9,404	42.65	2,716,241

## Tomatoes

The main centres of production of tomatoes are at Carnarvon and Geraldton and in the districts around Perth. At Carnarvon and Geraldton, because of the warm winter climate, growers are able to produce early crops and take advantage of the high prices ruling on the Melbourne market during the winter and spring. They also supply substantial quantities to the Perth market and in 1979-80, the export trade was principally with the Republic of Singapore and Christmas Island.

Supplies to the Perth market from December to June are grown in and near the metropolitan area, principally in the Shire of Wanneroo. Tomatoes are also grown in a number of districts in the South-West and Lower Great Southern Statistical Divisions.

The total area under tomatoes reached a peak of 629 hectares in 1944-45 but the average yield per hectare in that year was a low 12.02 tonnes per hectare. Since then, although the area has declined, yields per hectare have improved and production in 1979-80 was 8,390 tonnes from 232 hectares, an average yield of 36.09 tonnes per hectare.

## TOMATOES — AREA AND PRODUCTION

Season	Area	Production		
		Total	Average yield per hectare	Gross value
	hectares	tonnes	tonnes	\$
1974-75	212	7,085.48	33.42	2,714,304
1975-76	212	7,181.40	33.87	3,283,721
1976-77	238	8,723.14	36.61	4,053,314
1977-78	233	7,690.82	33.00	3,852,271
1978-79	231	7,736.79	33.49	3,629,194
1979-80	232	8,390.00	36.09	4,269,049

## Other Vegetables

## TURNIPS, CARROTS, PARSNIPS, BEETROOT — AREA AND PRODUCTION

Season	Turnips (swede and white)			Carrots			Parsnips			Beetroot		
	Production			Production			Production			Production		
	Area	Quan- tity	Gross value	Area	Quan- tity	Gross value	Area	Quan- tity	Gross value	Area	Quan- tity	Gross value
		tonnes	\$		tonnes	\$		tonnes	\$		kg	\$
1974-75	30	346	62,283	198	7,994	843,367	36	545	163,965	3	43,109	9,665
1975-76	32	320	41,887	217	8,715	1,247,378	30	585	144,561	3	55,350	9,908
1976-77	22	293	67,301	218	7,930	1,185,834	28	574	137,688	3	51,469	11,323
1977-78	20	238	49,980	247	9,618	2,019,780	23	555	266,000	2	39,977	13,192
1978-79	19	303	63,630	280	10,816	2,271,360	26	827	239,830	2	38,450	9,036
1979-80	20	293	62,116	292	11,405	2,166,950	36	1,049	325,190	3	57,522	14,381

In addition to the cultivation of potatoes, onions and tomatoes, previously mentioned, many other vegetables are produced, the bulk of them in or near the metropolitan area where growers benefit not only from proximity to the principal market but also from an abundant supply of

water at relatively shallow depths. Significant quantities of green peas and beans for processing, and cauliflowers, mainly for export, are now being produced in the Shires of Manjimup and Plantagenet, and small quantities of vegetables are produced in other country districts. An important early crop of beans is grown at Carnarvon and transported by road to Perth.

### PUMPKINS, BEANS, GREEN PEAS — AREA AND PRODUCTION

Season	Beans											
	Pumpkins			French and runner			Broad			Green peas		
	Area	Production		Area	Production		Area	Production		Area	Production	
		Quan- tity	Gross value		Quan- tity	Gross value		Quan- tity	Gross value		Quan- tity	Gross value
	ha	'000 bags	\$	ha	kg	\$	ha	kg	\$	ha	kg	\$
1974-75	408	99	667.481	304	2,125,280	762,616	16	126,748	27,885	891	6,834,718	308,968
1975-76	373	86	520,628	271	1,907,393	755,703	14	86,620	15,592	910	4,835,054	233,707
1976-77	355	90	759,412	243	1,714,211	755,384	27	195,348	37,116	886	5,824,914	319,464
1977-78	323	79	244,820	242	1,919,688	848,174	8	58,080	27,298	868	5,837,876	399,652
1978-79	276	70	385,745	253	2,152,153	1,348,745	8	37,690	25,252	755	4,769,573	353,807
1979-80	352	82	465,109	264	2,436,825	1,652,921	23	154,269	49,366	716	4,786,070	416,900

### CABBAGES, CAULIFLOWERS, LETTUCE — AREA AND PRODUCTION

Season	Cabbages			Cauliflowers			Lettuce		
	Production		Area	Production		Area	Production		Area
	Quantity	Gross value		Quantity	Gross value		Quantity	Gross value	
	hectares	'000 crates	\$	hectares	'000	\$	hectares	'000 crates	\$
1974-75	157	290	613,110	327	4,170	1,752,003	193	437	1,285,639
1975-76	140	234	589,048	301	3,944	1,600,199	170	375	1,192,292
1976-77	149	265	787,116	331	4,002	1,933,326	176	378	1,219,580
1977-78	147	248	821,800	356	4,266	2,418,753	186	395	1,899,708
1978-79	175	333	1,225,649	440	5,203	4,060,219	194	463	2,053,790
1979-80	146	283	963,703	510	5,864	3,393,486	193	439	2,127,903

## Orchards

### FRUIT (a) — AREA AND GROSS VALUE OF PRODUCTION

Season	Area (b)			Gross value of production				
	Orchard fruit	Plantation and berry fruit	Total	Pome (c)	Citrus (d)	Stone (e)	Other (f)	Total
	hectares	hectares	hectares	\$	\$	\$	\$	\$
1974-75	7,591	232	7,823	13,049,323	1,948,681	2,029,022	2,146,706	19,173,732
1975-76	6,939	212	7,151	13,756,120	2,017,536	2,236,603	2,688,256	20,698,515
1976-77	6,903	213	7,115	14,708,900	2,563,115	3,081,209	3,128,497	23,481,721
1977-78	6,330	235	6,565	12,769,249	2,899,101	3,510,740	4,680,220	23,859,310
1978-79	6,368	269	6,637	18,193,279	2,554,123	4,072,262	6,110,070	30,929,734
1979-80	6,412	288	6,700	20,052,952	2,926,927	4,173,068	3,115,253	30,268,200

(a) Excludes grapes. (b) Comprises bearing and non-bearing trees and plants. (c) Apples, pears and quinces. (d) Principally oranges, mandarins, lemons and grapefruit. (e) Plums, peaches, apricots, nectarines and cherries. (f) Bananas, loquats, figs, olives, passion fruit, almonds and other minor fruits.

Fruit production is largely confined to the temperate regions between Gingin to the north of Perth and Albany on the south coast. The cool, wet winters and warm, dry summers of this area permit the successful cultivation of a wide variety of fruits. In the southern and south-western sections, apples, pears and stone fruits are grown extensively while in the districts around Perth the principal crops are apples, stone fruits, citrus fruits and grapes. Outside this main fruit-growing area, banana plantations have been established at Carnarvon in the north-west.

### Apples

Apples, which are the principal fruit crop, account for more than half of the total orchard area. Donnybrook, Manjimup and the hills area near Perth (based on number of bearing and non-bearing trees) are the most important centres but other districts in the south-west produce large quantities. In 1979-80 the total number of bearing trees was 749,029 which produced 2,831,637 cases, the principal varieties being Granny Smith, Jonathan, Yates, Delicious and Cleopatra.

APPLES — NUMBER OF TREES AND PRODUCTION

Season	Number of trees		Production		
	Bearing	Non-bearing	Total	Average yield	Gross value
				per bearing tree	
			cases	cases	\$
1974-75	908,210	133,871	2,730,724	3.0	11,890,338
1975-76	873,058	120,718	2,672,096	3.1	12,594,488
1976-77	834,200	103,567	2,203,319	2.6	12,322,574
1977-78	764,094	76,755	1,781,249	2.3	11,442,525
1978-79	765,409	82,988	2,372,603	3.1	16,463,773
1979-80	749,029	82,561	2,831,637	3.8	17,967,506

There is a valuable export trade, with 887,826 cases being exported overseas in 1979-80. The Republic of Singapore is the most important market, followed by the United Kingdom, Malaysia and the Federal Republic of Germany.

### Pears

Pears are usually grown in conjunction with apples but the number of trees planted and the quantity produced are much less, the total number of bearing trees in 1979-80 being 70,321 and the production 281,613 cases. The bulk of the crop is consumed locally but significant quantities were exported in 1979-80, principally to the Republic of Singapore, Malaysia and the Netherlands.

PEARS — NUMBER OF TREES AND PRODUCTION

Season	Number of trees		Production		
	Bearing	Non-bearing	Total	Average yield	Gross value
				per bearing tree	
			cases	cases	\$
1974-75	63,067	26,485	241,516	3.8	1,158,773
1975-76	62,907	26,739	255,757	4.1	1,161,309
1976-77	61,143	25,775	253,830	4.2	2,201,913
1977-78	59,226	26,646	237,078	4.0	1,326,444
1978-79	66,558	22,980	258,974	3.9	1,729,200
1979-80	70,321	21,009	281,613	4.0	2,085,446

### Citrus Fruit

While the Shire of Chittering is the chief citrus fruit producer, there are other important areas near Perth in the Shires of Kalamunda and Swan and the Town of Armadale, and in the south-west, in the Shires of Harvey and Capel (in order according to number of trees bearing and non-bearing). Although oranges are by far the most important crop, substantial quantities of lemons and mandarins, and lesser quantities of grapefruit are also produced.

Production is largely for local consumption but there is some export trade, in 1979-80 the most important buyers being the Republic of Singapore, Hong Kong, Christmas Island and Mauritius.

## ORANGES AND MANDARINS — NUMBER OF TREES AND PRODUCTION

Season	Oranges				Mandarins			
	Number of trees		Production		Number of trees		Production	
	Bearing	Non-bearing	Quantity	Gross value	Bearing	Non-bearing	Quantity	Gross value
			cases	\$			cases	\$
1974-75	285,172	35,009	371,993	1,238,785	39,669	14,474	52,932	278,775
1975-76	258,708	25,191	374,899	1,280,797	36,835	10,472	51,164	365,652
1976-77	247,674	19,283	404,901	1,620,025	36,621	9,849	63,543	488,010
1977-78	233,283	16,942	399,994	2,008,730	37,334	8,596	62,485	379,648
1978-79	217,341	13,257	288,076	1,611,861	37,343	7,635	61,744	421,712
1979-80	209,558	17,702	369,556	1,908,567	35,648	8,007	62,502	426,889

## LEMONS, LIMES AND GRAPEFRUIT — NUMBER OF TREES AND PRODUCTION

Season	Lemons and limes				Grapefruit			
	Number of trees		Production		Number of trees		Production	
	Bearing	Non-bearing	Quantity	Gross value	Bearing	Non-bearing	Quantity	Gross value
			cases	\$			cases	\$
1974-75	33,074	12,040	112,986	369,930	9,222	6,712	19,210	60,852
1975-76	29,506	13,222	108,622	321,141	9,312	6,493	15,598	49,419
1976-77	30,742	10,146	110,751	355,238	10,095	4,427	20,970	98,735
1977-78	33,142	7,132	117,191	385,350	10,703	1,752	19,723	107,567
1978-79	32,580	5,936	115,097	351,746	10,553	1,642	18,917	162,637
1979-80	32,916	3,826	114,683	445,144	9,377	1,469	19,381	146,327

## Stone Fruits

Plums, peaches, apricots, nectarines and cherries are grown in the hills districts in the Darling Range near Perth, in the Swan Valley and in many districts in the south-west. The total number of stone fruit trees (bearing and non-bearing) in 1979-80 was 197,251, comprising 81,591 plum and prune trees, 75,330 peach trees, 17,464 apricot trees, 15,198 nectarine trees and 7,668 cherry trees. The bulk of the stone fruit crop is consumed locally but shipments are sent overseas. Plums are the most important stone fruit exported overseas, and in 1979-80 the main markets were the Republic of Singapore, Malaysia and Hong Kong.

## PLUMS AND PEACHES — NUMBER OF TREES AND PRODUCTION

Season	Plums and prunes				Peaches			
	Number of trees		Production		Number of trees		Production	
	Bearing	Non-bearing	Quantity	Gross value	Bearing	Non-bearing	Quantity	Gross value
			cases	\$			cases	\$
1974-75	68,794	11,492	149,435	1,090,579	49,142	14,876	105,968	592,130
1975-76	63,651	9,754	144,187	1,166,577	46,516	14,095	102,246	621,168
1976-77	65,082	9,927	147,840	1,460,196	46,783	14,574	102,328	910,713
1977-78	62,818	10,854	137,086	1,781,537	46,048	15,096	90,893	981,502
1978-79	63,872	12,798	154,197	1,958,242	51,224	19,037	127,804	1,404,496
1979-80	65,658	15,933	152,116	2,091,909	54,501	20,829	141,093	1,432,409

## APRICOTS AND NECTARINES — NUMBER OF TREES AND PRODUCTION

Season	Apricots				Nectarines			
	Number of trees		Production		Number of trees		Production	
	Bearing	Non-bearing	Quantity	Gross value	Bearing	Non-bearing	Quantity	Gross value
			cases	\$			cases	\$
1974-75	12,808	3,118	21,940	179,615	6,337	2,664	13,244	119,726
1975-76	11,775	3,863	19,703	254,825	6,785	3,020	12,323	113,043
1976-77	12,106	2,868	23,095	306,471	7,413	3,124	14,090	186,129
1977-78	11,053	3,174	19,138	360,011	7,727	4,370	13,773	180,369
1978-79	11,420	4,798	21,338	348,450	8,769	4,931	18,189	214,994
1979-80	11,381	6,083	26,051	282,914	10,331	4,867	24,547	298,737



## Bananas

Production of bananas is confined almost entirely to a narrow strip of land along the Gascoyne River at Carnarvon. The plantations are dependent on water pumped from bores which tap a subterranean flow in the sands of the usually dry river bed. As a surface flow in the river channel results only from heavy rains, which do not occur every year, a problem is presented in the falling-off of water supplies and in the increase in the salt content of the underground water during long dry periods. These conditions and also periodic damage from cyclones cause fluctuations in the area of the plantations and in production.

The crop is transported by road to Perth and sold locally in competition with bananas imported from other Australian States.

### BANANAS — AREA AND PRODUCTION

Season	Area		Production		
	Plants of bearing age	Young plants not bearing	Total	Average yield per hectare (a)	Gross value
	hectares	hectares	tonnes	tonnes	\$
1974-75	168	18	5,629.43	33.51	1,733,493
1975-76	150	27	5,271.70	35.14	2,204,905
1976-77	162	20	5,560.77	34.33	2,502,348
1977-78	166	37	5,408.78	32.58	4,056,584
1978-79	186	53	6,232.90	33.51	5,048,652
1979-80	194	62	3,334.48	17.22	2,100,722

(a) Calculated on the area of bearing plants only.

## Vineyards

Over 50 per cent of the State's 2,553 hectares of grape vines are in the Shire of Swan, other historically important centres being Chittering, Wanneroo, Toodyay and Gosnells. In recent years significant areas of vines have been planted at Gingin, Margaret River, Mount Barker and Frankland River and wines produced have shown considerable promise, winning major awards around Australia.

In the dried vine fruit industry, currants are the main item of production and a high proportion of the crop is exported. In 1979-80, over 63 per cent of exports went to other Australian States, mainly New South Wales, the remainder being purchased primarily by the United Kingdom and the Republic of Singapore.

Table grapes are grown for the local market and for export overseas, mainly to Indonesia and the Republic of Singapore. The production of beverage wines reached a record of over 4 million litres in 1979-80. Most of the wine produced is for local consumption although approximately 450,000 litres was exported to other Australian States and overseas in 1979-80.

### GRAPES — AREA AND PRODUCTION

Season	Area		Grapes used for wine making and table use		Dried vine fruits		Wine production	
	Vines of bearing age	Young vines not bearing	Quantity	Gross value	Quantity	Gross value	Beverage (a)	Distillation
	hectares	hectares	tonnes	\$'000	tonnes	\$'000	litres	litres
1974-75	2,276	326	7,652	1,309	1,198	763	3,608,297	654,963
1975-76	2,010	364	7,257	1,318	1,068	681	3,198,158	879,270
1976-77	2,048	397	7,419	1,685	876	560	3,729,330	543,175
1977-78	2,200	340	7,431	1,655	916	594	3,158,007	540,885
1978-79	2,269	291	8,174	2,755	820	607	3,507,509	638,138
1979-80	2,324	229	8,850	2,634	889	802	4,059,711	414,496

(a) Includes spirit produced from distillation wine and used in fortification.

## Nurseries

The main concentration of commercial nurseries is in the areas of Wanneroo, Kalamunda and Canning Vale in the Perth Statistical Division. Most nurseries produce ornamental shrubs and trees; some specialise in the production of bedding plants while others concentrate on cut-flower production. Fruit trees, mainly citrus, are produced by specialist nurseries in the Perth Statistical Division while pome and stone fruit trees are mostly produced in the South-West Statistical Division at Manjimup and Donnybrook.

NURSERIES (a) — AREA AND VALUE OF PLANT SALES (b)

Particulars		1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Area	hectares	141	136	153	191	236	(c)
Sales (year ended 30 June) (d)	\$	3,975,030	4,681,738	5,939,024	7,868,320	10,474,782	(c)

(a) Excludes non-commercial nurseries and commercial nurseries with total sales of nursery products less than \$500 in 1974-75 and those with less than \$1,500 in subsequent years. (b) Value at the holding, after deducting costs incurred in marketing. (c) This information was not collected in 1979-80. (d) Sales between nurseries included in the census have been excluded.

## Artificial Fertilisers

Soils in Western Australia are acutely deficient in phosphate, and regular applications of phosphatic fertiliser are required for crop and pasture growth. Newly cleared land may require applications of up to 230 kilograms of superphosphate per hectare for satisfactory crop yields, but annual applications can be reduced as the phosphate content of the soil is improved through the residual effect of the added fertiliser. On established land, applications of 100 kilograms to 120 kilograms of superphosphate per hectare are commonly used in wheat growing.

Nitrogen deficiencies also exist in some areas. Legume pastures have assisted greatly in building up nitrogen in the soil and in some situations appreciable increases in yield may be achieved by applying forms of concentrated nitrogenous fertiliser.

ARTIFICIAL FERTILISER USED ON RURAL HOLDINGS

Season	Crops				Average per hectare	Pastures (a)				
	Area fertilised	Quantity used				Area fertilised	Quantity used			Average per hectare
		Super- phosphate (b)	Other artificial fertilisers	Total			Super- phosphate (b)	Other artificial fertilisers	Total	
1974-75	3,584,892	432,491	106,252	538,743	0.15	5,304,270	713,926	36,862	750,788	0.14
1975-76	3,764,930	402,767	121,100	523,867	0.14	4,013,972	444,914	21,078	465,992	0.12
1976-77	4,091,336	409,138	148,623	557,760	0.14	4,224,585	450,420	24,383	474,803	0.11
1977-78	4,573,468	367,102	212,351	579,454	0.13	4,357,208	480,496	37,784	518,280	0.12
1978-79	4,713,656	346,628	219,196	565,823	0.12	4,083,188	456,959	41,322	498,281	0.12
1979-80	n.a.	360,804	230,958	591,762	n.a.	4,830,858	554,682	52,603	607,285	0.13

(a) Includes lucerne for all purposes. (b) Includes superphosphate with trace elements.

## PASTORAL PRODUCTION

Throughout this section, where mention is made of the 'pastoral areas' the portion of the State referred to comprises the Kimberley and Pilbara Statistical Divisions and the Sub-divisions of Lefroy, Gascoyne and Carnegie. The balance of the State, referred to as the 'agricultural areas', comprises the Perth, South-West, Upper Great Southern, Lower Great Southern and Midlands Statistical Divisions and the Sub-divisions of Dundas and Greenough.

In the early days of settlement, pastoral activities in Western Australia were confined largely to what are now the agricultural areas and were usually associated with the cultivation of crops. However, beginning with Captain George Grey's visit in 1838 to the area known as the West Kimberley, explorers increasingly drew attention to the pastoral possibilities of large sections of the present Kimberley, Pilbara and Central Statistical Divisions.

In 1857 and 1858, F. T. Gregory noted the existence of good pastoral country in the Murchison and the Gascoyne districts and in the course of a journey further to the north in 1861

he discovered the Ashburton, Fortescue, De Grey and Oakover Rivers. His reports of good grazing lands in the area led to the establishment of sheep stations by pastoralists from the south, the first of such ventures in 1863, being in the De Grey district of what is now the Pilbara Statistical Division. Graziers were also turning their attention to the south-east and in the 1870s pastoral lands were being taken up in the coastal areas to the south of the Nullarbor Plain. Another development in the extension of pastoral activity began with Alexander Forrest's journey through the Kimberley in 1879 and his favourable reports on the suitability of the country for grazing. Leases along the Fitzroy and the Ord Rivers were stocked not only with livestock shipped from the south and from the other Australian Colonies but also with cattle brought overland to the area, principally from Queensland and New South Wales, by remarkable feats of droving.

The value of production from the pastoral areas for 1979-80 was 3.8 per cent of the total gross value of Western Australian agricultural production.

### Sheep

The following table shows the total numbers of sheep and their distribution between the agricultural and pastoral areas, in each year from 1961 to 1980. Additional details showing the numbers of sheep in the State appear in the Statistical Summary following Chapter X.

SHEEP NUMBERS AND DISTRIBUTION

At 31 March —	In agricultural areas		In pastoral areas		State total
	Number	Proportion of State total (per cent)	Number	Proportion of State total (per cent)	
1961	13,940,614	81.3	3,210,770	18.7	17,151,384
1962	14,951,185	81.6	3,362,694	18.4	18,313,879
1963	15,403,902	82.3	3,323,222	17.7	18,727,124
1964	16,608,300	82.4	3,556,568	17.6	20,164,868
1965	18,670,759	83.4	3,721,075	16.6	22,391,834
1966	20,695,040	84.7	3,731,768	15.3	24,426,808
1967	23,525,280	86.0	3,845,106	14.0	27,370,386
1968	26,406,575	87.6	3,754,302	12.4	30,160,877
1969	28,888,450	87.8	4,012,708	12.2	32,901,158
1970	29,844,044	88.7	3,789,913	11.3	33,633,957
1971	31,129,804	89.7	3,579,044	10.3	34,708,848
1972	31,049,873	90.2	3,355,125	9.8	34,404,998
1973	27,777,077	89.8	3,142,103	10.2	30,919,180
1974	29,423,820	90.7	3,027,253	9.3	32,451,073
1975	31,472,640	91.3	3,003,697	8.7	34,476,337
1976	31,577,937	90.8	3,192,785	9.2	34,770,722
1977	28,206,722	90.5	2,951,591	9.5	31,158,313
1978	27,621,890	92.6	2,201,226	7.4	29,823,116
1979	28,250,354	93.3	2,014,364	6.7	30,264,718
1980	28,729,643	94.4	1,701,319	5.6	30,430,962

The present distribution of sheep in the State is the result of two opposite trends operating over many years. In the pastoral, or station areas where the industry is based on long-term pastoral leases, overuse of the vegetation resource base, severe droughts and reduced profitability have led to a decline in the number of sheep. In the agricultural, or farming areas, however, the sheep population has generally risen. Factors contributing to this rise have been the increasing use of subterranean clover in the wheat belt, the provision in many areas of more assured water supplies, a taxation policy which, by the provision of special concessions to primary producers, has encouraged farmers to clear and develop new land, the War Service Land Settlement Scheme which developed new areas and the stimulating effect of buoyant wool prices in the post-war period.

The result has been a marked upward trend in sheep numbers particularly during the 1960s, modified by the effect of poor seasons such as 1972-73 and 1976-77. From the late 1970s, improved prices for sheep meat and sheep for live export have given confidence to the

industry. Sheep numbers reached a peak of 34.8 million at 31 March 1976 but declined to 29.8 million at 31 March 1978 mainly as a result of the poor seasonal conditions and the continuing decline in pastoral areas. Numbers in the agricultural areas increased from 7 million or 72 per cent of the State total in 1945, to 28.7 million or over 94 per cent at 31 March 1980. Numbers generally increased in pastoral areas after 1945 until they reached more than 4 million in 1969. Since then numbers have declined to 1.7 million in 1979-80 and as a percentage of the State total this represents a decline from 28 per cent to just under 6 per cent.

In the following table, sheep flocks at 31 March 1980 are classified according to the size of the flock. Of the 18,395 establishments of all types, sheep were carried on 11,687. Establishments carrying between 1,000 and 3,999 sheep accounted for 53 per cent of the flocks and 46 per cent of the total number of sheep. Those with less than 1,000 sheep accounted for 28 per cent and 4 per cent, respectively, and those with more than 3,999 accounted for 19 per cent and 50 per cent, respectively.

An analysis of collected data relating to breeds of sheep as at 31 March 1980 showed that Merinos accounted for 93 per cent of the total. Corriedales, Polwarths and British breeds, the most important of which are Border Leicester, Dorset Horn, Poll Dorset, Southdown and Suffolk, comprised 4 per cent and 2 per cent was made up of Crossbreds, including Merino Comebacks.

SHEEP FLOCKS AT 31 MARCH 1980  
CLASSIFIED ACCORDING TO SIZE OF FLOCK

Size of flock (numbers)	Number of —	
	Flocks	Sheep
1 — 99	822	30,544
100 — 499	1,125	317,219
500 — 999	1,341	995,634
1,000 — 1,499	1,442	1,791,616
1,500 — 1,999	1,215	2,112,525
2,000 — 2,999	2,108	5,186,783
3,000 — 3,999	1,416	4,862,149
4,000 — 4,999	772	3,416,103
5,000 — 5,999	478	2,607,727
6,000 — 6,999	320	2,057,077
7,000 — 7,999	190	1,407,437
8,000 — 8,999	124	1,039,937
9,000 — 9,999	74	698,673
10,000 — 14,999	186	2,226,516
15,000 — 19,999	48	822,964
20,000 — 49,999	23	620,200
50,000 and over	3	237,858
Total	11,687	30,430,962

### Marketing of Lamb

**Lamb Marketing Board.** All lamb produced for slaughter south of the twenty-sixth parallel in Western Australia is marketed through the Western Australian Lamb Marketing Board. The Board was established by the *Marketing of Lamb Act 1971* and began operations in December 1972. It came into being mainly as a result of pressure from, and following a referendum of the State's lamb producers who looked to the Board to improve the stability of their industry and increase returns.

As provided by the Act, the Lamb Marketing Board consists of five members, four of whom are appointed by the Governor and an *ex officio* member, the manager of the Board, who is its chief executive officer. Of the appointed members, two are elected producer representatives, and two are nominated by the Minister for Agriculture; one of these is a meat trade representative and the other who is neither a producer nor financially interested in the slaughter, distribution or sale of lamb shall be Chairman of the Board. The major aims of the Board are to administer an orderly method of marketing and encourage producer participation in lamb

marketing, operate an advance price schedule, and a weight and grade system and rationalise procedures throughout the industry.

Apart from control of the local market supplies the Board also is responsible for arranging exports of lamb. During the period of the Board's operations there has been a marked change in the pattern of export sales of Western Australian lamb with the traditional United Kingdom market being replaced by other markets.

### Wool

Total wool production in 1979-80 amounted to 158,184 tonnes, of which shorn wool accounted for 146,559 tonnes. It was shorn from 34.9 million sheep and lambs, the average weight of wool shorn being 4.2 kilograms. The balance of the 1979-80 production comprised 1,337 tonnes of dead and fellmongered wool, and 10,288 tonnes of wool exported on skins.

During the war years wool was compulsorily acquired by the Commonwealth Government in accordance with an agreement with the United Kingdom. The scheme was administered by the Central Wool Committee and the price paid was determined by a system of appraisement which, however, operated within limits agreed upon by the two Governments. During this period large stocks of wool were accumulated and after the war an organisation was formed with the object of selling this surplus with the least possible disturbance to ruling prices. Government control of wool ceased after the war and wool auctions operated by members of the National Council of Wool Selling Brokers of Australia were resumed in Perth in 1946. In September 1957, auctions were held at Albany for the first time. Sales in Perth were discontinued in 1960 when the selling centre was transferred to Fremantle. These sales are attended by Australian and overseas buyers who bid for individual lots. Some wool is auctioned at sales conducted independently of the National Council and a portion of the clip is purchased on farms by wool dealers who buy direct from producers.

The Australian Wool Board, constituted under the *Wool Industry Act* 1962, came into being in 1963 and replaced the Australian Wool Bureau which was established by the *Wool Use Promotion Act* 1953. The function of the Board was to promote the use of wool and wool products in Australia and other countries and to inquire into methods of marketing wool. A subsidiary of the Board, the Australian Wool Testing Authority was responsible for the provision of a testing service for wool and wool products. In 1967 the Wool Board recommended the establishment of an authority to enforce standards of clip preparation, to conduct a price averaging plan and, in conjunction with wool selling brokers, to conduct a system of supply management involving chiefly wools in the price averaging plan. These proposals, with some amendments, were accepted by the Australian Wool Industry Conference and the Commonwealth Government and on 1 July 1970 The Australian Wool Marketing Corporation Pty. Ltd. (a non-statutory body) began operations.

In November 1970 the Australian Wool Commission Act established the Australian Wool Commission which was empowered to take over the functions of The Australian Wool Marketing Corporation Pty. Ltd. The Commission was required to operate a flexible reserve price scheme for wool sold at auction and to perform other functions aimed at improving the marketing of Australian wool.

The Reserve Price Scheme was initiated in two stages in 1970 and 1974. It is administered by the Australian Wool Corporation and has two levels. The first is the 'base' reserve price which has a continuous steadying influence on the market. This reserve price is announced by the Minister for Primary Industry each year. The second level is the Flexible Reserve Price, which is not disclosed but which is used, when necessary, to steady short term fluctuations above the floor price. The Reserve Price Scheme is financed by growers who pay 5 per cent of their gross wool proceeds into the Market Support Fund.

Following a submission by the Australian Wool Industry Conference and a report by a Government committee the Australian Wool Corporation was established by the *Wool Industry*

*Act 1972.* This Act repealed both the *Wool Industry Act 1962* and the *Australian Wool Commission Act 1970* and vested all rights, property and assets of the Australian Wool Board and the Australian Wool Commission in the Australian Wool Corporation. The Corporation came into operation on 1 January 1973 and took over the functions of both the Australian Wool Board and the Australian Wool Commission which ceased to operate on that date. The functions of the Corporation relate to wool marketing, wool use promotion, wool testing, wool research and the management of wool stores. Sale by sample and test certificate is now used for 94 per cent of the woolclip sold by auction or tender. This system has enabled sale by separation, where wool is stored in one centre and sold in another. Wool selling centres with infrequent sales use this method to reduce delays in payment to growers.

Following amendments to the *Wool Industry Act* in 1977 the Corporation now has an active role in negotiating sea freights for wool to Australia's main markets.

The number of sheep and lambs shorn, the average weight of wool shorn per sheep or lamb, and production of wool are given in the following table.

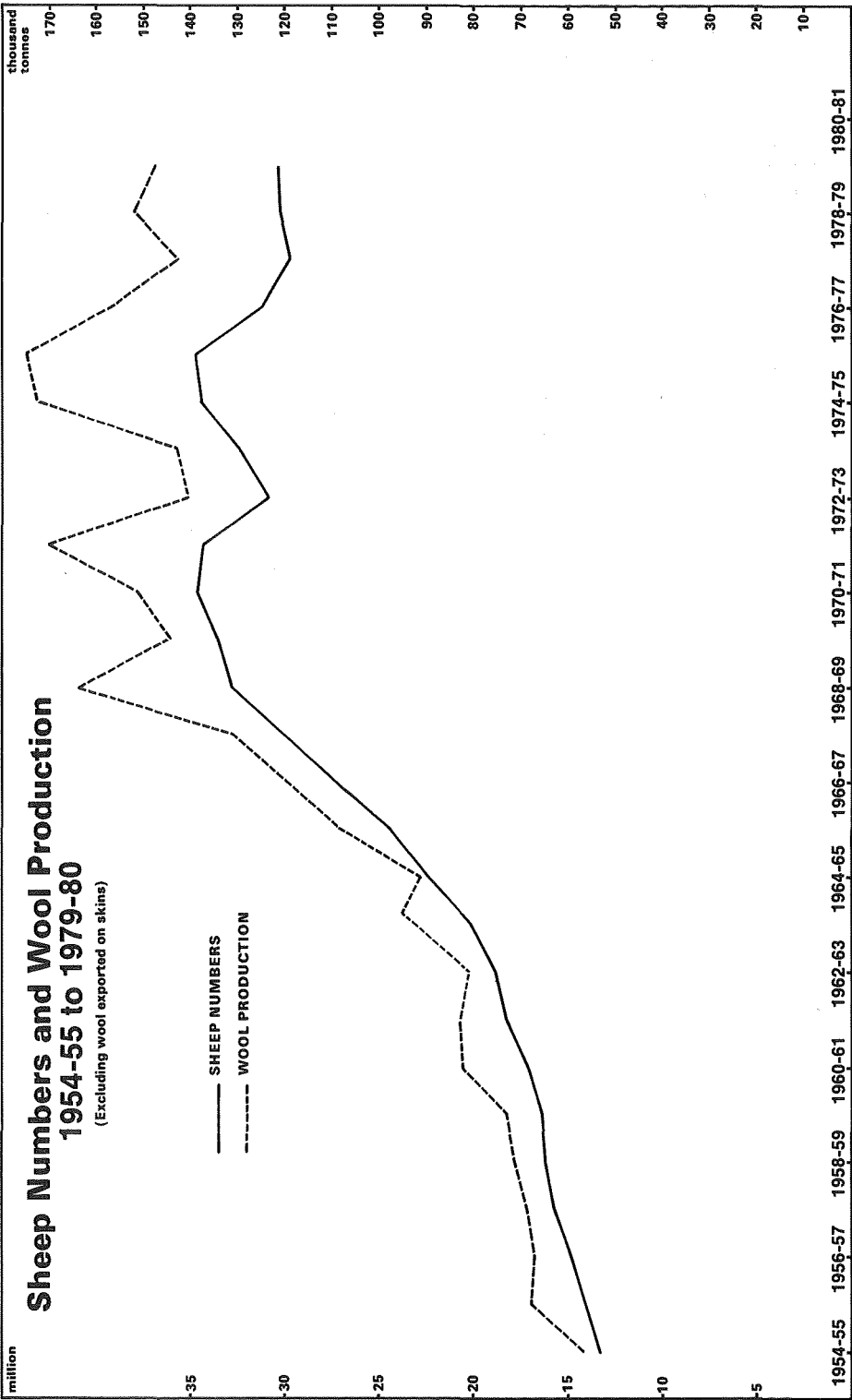
SHEEP SHORN AND WOOL PRODUCTION  
YEAR ENDED 30 JUNE

Year	Sheep shorn			Average weight of wool shorn	Wool production (in the grease)			
	Sheep	Lambs	Total		Shorn	Dead and fell-mongered	Exported on skins	Total
	'000	'000	'000		tonnes	tonnes	tonnes	tonnes
1974-75	30,348	7,644	37,992	4.5	172,093	566	7,317	179,975
1975-76	31,363	7,526	38,889	4.5	173,987	820	8,815	183,622
1976-77	29,175	6,114	35,289	4.4	154,919	1,318	10,138	166,375
1977-78	28,293	5,580	33,873	4.2	141,929	1,198	6,275	149,402
1978-79	27,321	6,534	33,855	4.4	148,960	1,324	4,858	155,142
1979-80	27,804	7,091	34,895	4.2	146,559	1,337	10,288	158,184

The number of sheep and lambs shorn, wool clip and average weight of wool shorn in each statistical division for the season 1979-80 are given in the following table.

SHEEP AND LAMBS SHORN AND WOOL CLIP IN STATISTICAL DIVISIONS  
YEAR ENDED 31 MARCH 1980

Statistical division	Sheep and lambs shorn	Wool clip	Average weight of wool shorn		
			Sheep	Lambs	Total
	number	kg	kg	kg	kg
Perth Statistical Division	292,230	831,402	2.9	1.4	2.8
Other divisions —					
South-West	1,582,765	6,038,238	4.4	1.4	3.8
Lower Great Southern	8,840,882	37,531,360	4.9	1.5	4.2
Upper Great Southern	8,112,733	34,029,067	5.0	1.4	4.2
Midlands	9,273,906	38,208,241	4.9	1.5	4.1
South-Eastern	2,888,380	12,856,198	5.1	1.8	4.5
Central	3,986,803	16,620,654	4.8	1.4	4.2
Pilbara	353,205	1,274,774	3.8	1.3	3.6
Kimberley	79	248	4.6	1.3	3.1
Total	35,038,753	146,558,780	4.9	1.5	4.2
WESTERN AUSTRALIA	35,330,983	147,390,182	4.9	1.5	4.2



The next table shows the gross value of wool production for the six years 1974-75 to 1979-80.

GROSS VALUE OF WOOL PRODUCTION  
(\$'000)

Year	Shorn wool	Dead wool and fellmongered wool	Wool exported on skins	Total
1974-75	218,351	508	6,039	224,898
1975-76	241,477	550	9,408	251,434
1976-77	274,469	1,146	15,743	291,358
1977-78	256,794	1,240	11,744	269,778
1978-79	285,079	1,521	6,169	292,769
1979-80	346,612	1,602	9,061	357,275

Although the greater proportion of the wool clip is exported in the grease, scouring or degreasing is done in the State and degreased wool is an appreciable item in the external wool trade. During 1979-80 exports of greasy and degreased wool were 125,712 tonnes and 16,554 tonnes, respectively. The most important buyers of greasy wool were Japan, the Federal Republic of Germany, the Union of Soviet Socialist Republics, Italy, France, Poland, the Republic of Korea, and China, Taiwan Province only. Principal purchasers of degreased wool were Japan, Italy, the United States of America, the Federal Republic of Germany and the United Kingdom. Further details of exports of greasy and degreased wool, both interstate and overseas, are given in Chapter IX, Part 1 — *External Trade*.

### Cattle

Cattle are classified according to the two main purposes of 'meat production' and 'milk production', irrespective of breed.

The table below shows the numbers of cattle for meat production kept on agricultural establishments at 31 March 1975 to 1980. A later table details, for the same period, the numbers kept for milk production. Cattle numbers in each State and Territory at 31 March 1980 are given in a table later in this Part.

In 1980 the Kimberley Statistical Division carried 788,811 head of cattle for meat production, or 40.7 per cent of the State total. Other pastoral areas carried 163,096 head and agricultural areas 985,652.

The cattle which were originally shipped or driven overland from the other Australian Colonies to start the industry in the northern pastoral areas were predominantly shorthorn breeds, and these still form the great bulk of all cattle kept for meat production in those areas. Carcass weights, however, have been increased by importing better-type bulls, by improving watering facilities on the cattle stations and by the replacement of droving by the transport of the animals from stations to abattoirs in large road trucks.

There are killing and freezing works at the ports of Wyndham, Broome and Derby and consignments of frozen and chilled beef from these centres go mainly to overseas destinations. Some of it is sent south for consumption in the metropolitan area and live cattle are also shipped from northern ports to overseas markets. By far the greater proportion of beef consumed in the southern part of the State, however, is supplied from the agricultural areas, some of it being from stock culled from dairy herds.

The following table shows the numbers and proportions of cattle for meat production in agricultural areas and in pastoral areas at 31 March 1975 to 1980. At 31 March 1966, the proportion of cattle kept for meat production in agricultural areas was only 42.5 per cent, with 451,062 cattle out of a total of 1,061,767. The importance of the agricultural areas as a source of meat production increased steadily until 1975 when 63.7 per cent of cattle kept for meat production were in these areas. However, since 1975 this proportion has decreased each year to 50.9 per cent at 31 March 1980.



## CATTLE FOR MEAT PRODUCTION — NUMBERS AND DISTRIBUTION

Particulars	At 31 March —					
	1975	1976	1977	1978	1979	1980
Number of head —						
In agricultural areas	1,513,514	1,547,908	1,325,113	1,165,974	1,016,661	985,652
In pastoral areas	862,283	939,065	987,397	971,264	947,487	951,907
Total	2,375,797	2,486,973	2,312,510	2,137,238	1,964,148	1,937,559
	per cent	per cent	per cent	per cent	per cent	per cent
Proportion of total —						
In agricultural areas	63.7	62.2	57.3	54.6	51.8	50.9
In pastoral areas	36.3	37.8	42.7	45.4	48.2	49.1

CATTLE FOR MEAT PRODUCTION AT 31 MARCH 1980  
CLASSIFIED ACCORDING TO SIZE OF HERD AND LOCATION

Size of herd (numbers)	In agricultural areas		In pastoral areas		Whole State	
	Number of —		Number of —		Number of —	
	Herds	Cattle	Herds	Cattle	Herds	Cattle
1 — 29	2,058	24,332	31	392	2,089	24,724
30 — 49	933	36,253	16	603	949	36,856
50 — 69	795	46,854	13	762	808	47,616
70 — 99	862	71,829	16	1,308	878	73,137
100 — 149	876	107,043	12	1,433	888	108,476
150 — 199	582	100,296	11	1,835	593	102,131
200 — 299	599	145,259	21	4,770	620	150,029
300 — 399	302	103,278	21	7,295	323	110,573
400 — 499	153	68,083	7	3,122	160	71,205
500 — 699	141	81,161	21	12,002	162	93,163
700 — 999	89	72,871	20	17,183	109	90,054
1,000 — 1,499	34	40,739	19	21,640	53	62,379
1,500 — 1,999	13	22,173	12	20,697	25	42,870
2,000 — 4,999	14	41,581	38	120,187	52	161,768
5,000 — 9,999	—	—	25	179,680	25	179,680
10,000 and over	2	23,900	34	558,998	36	582,898
Total	7,453	985,652	317	951,907	7,770	1,937,559

## Slaughtering

Beef from cattle slaughtered at Wyndham, Broome and Derby in the Kimberley Division is principally for export. The local market for meat is supplied mainly from abattoirs at Fremantle, Waroona, Harvey, Bunbury, Albany, Geraldton, Wooroloo, Katanning and Kalgoorlie. Most of these establishments also slaughter for the export trade. Owing to poor seasonal conditions and resultant high slaughtering levels over the preceding four years, stock numbers available for slaughter in 1979-80 fell marginally. Small establishments operating in country towns also contribute substantially to total production, and most stations and many farms slaughter sufficient for all or part of their own requirements.

## LIVESTOCK SLAUGHTERED AND MEAT PRODUCED

Year	Livestock slaughtered (a)						Meat produced (b)	
	Sheep		Lambs		Cattle and calves		Mutton and lamb	Beef and veal
	Number	Gross value (c)	Number	Gross value (c)	Number	Gross value (c)		
	'000	\$'000	'000	\$'000	'000	\$'000	tonnes	tonnes
1974-75	3,037	17,212	1,330	11,115	542	40,092	76,018	106,117
1975-76	4,394	19,183	1,745	13,573	793	45,803	103,303	147,223
1976-77	4,193	30,885	1,833	18,094	918	65,062	93,762	160,287
1977-78	2,668	31,329	1,487	20,512	848	76,931	65,483	148,149
1978-79	2,454	30,575	1,384	19,313	749	101,398	63,272	136,141
1979-80	2,917	47,251	1,556	24,561	613	149,165	73,706	116,199

(a) Mainly slaughtering for human consumption but also includes quantities condemned and small numbers of livestock slaughtered for boiling down. (b) Dressed carcass weight; excludes condemned carcasses and offal. (c) Value 'on hoof' at principal market.

## DAIRYING

Compared with the wheat, wool and meat producing industries, dairying as a major well-organised rural activity is of fairly recent origin. Its growth was retarded initially by the difficulty of clearing heavily-timbered country in the south-west and the need for special methods of pasture establishment, but these problems were progressively overcome and dairying became a significant feature of primary production. In recent years dairy production has been increasingly affected by a cost/price squeeze and loss of traditional markets.

Until the establishment of the first butter factory at Busselton in 1898, dairy farming in Western Australia was essentially for the production of whole milk, although small quantities of farm butter were marketed. As more factories commenced processing, the industry steadily developed and its growth was further stimulated by the establishment of irrigation areas, the first at Harvey in 1916, and by the introduction of the Group Settlement Scheme in 1921. Another important factor in increasing production was the successful establishment of subterranean clover which resulted in a marked improvement in pastures.

In 1933, a Milk Board was established by State legislation, with the primary purpose of regulating the supply of liquid whole milk and fresh table cream to the Perth metropolitan area and, in later years, to other main centres of population in the south-west portion of the State. Under the Board, dairymen's contract quantities were established as a means of ensuring that sufficient milk was produced to meet the needs of the domestic market throughout the year.

The Board was succeeded in 1974 by the present Dairy Industry Authority, which consists of a chairman and eight members, representing all sections of the industry. The powers and functions of the Authority extend over the whole of the dairy industry of Western Australia whereas the Milk Board covered milk for liquid consumption only. The Act provides for the Authority to purchase and sell milk and dairy products under vesting provisions in the *Dairy Industry Act 1973-1980*. The Authority has adopted a modern and vigorous attitude towards the promotion of milk as a low-priced, high quality product. It has, with the approval of the State Government, taken positive steps to assure the supply of milk for domestic purposes in Western Australia throughout the 1980s and beyond. By implementing a Dairy Assistance Plan, it has been possible, during the years since 1975, to provide quotas for most dairymen who desire them and who are capable of meeting the bases and principles for the production of milk for human consumption, both in quantity and quality. Western Australia has been a leader in this positive attitude to the needs of the consumer and to those who service the dairy industry.

The introduction in 1977 of quotas for milk used in the production of flavoured milk and yoghurt provided an additional stimulus to production. These items, together with fresh table cream, form a valuable adjunct to the market for liquid milk. These are dairy products providing good dietary foods for consumers and, at the same time assuring a stable income for those persons involved in their production, processing and distribution.

The industry has been assisted by the extensive experimental work carried out by the Department of Agriculture and the advisory service which it provides on all aspects of dairy farming.

Price instability has been one of the major difficulties of the industry and in 1926 the 'Paterson Plan', which was a voluntary scheme of price stabilisation, was introduced. It met with considerable success but weaknesses finally became apparent and it was abandoned in 1934 in favour of the Dairy Products Marketing Regulation Act passed by the State Parliament. On 1 April 1946, Western Australia entered the voluntary butter price equalisation scheme, operated since 1936 by the Commonwealth Dairy Produce Equalisation Committee Ltd and in January 1947 the State extended its participation to include cheese. The Committee, which comprised certain members of the State Dairy Products Boards and other persons representing the industry, entered into agreements with manufacturers to secure to them equal rates from sales of butter and also of cheese, and for this purpose fixed basic prices at which these products sold in

Australia or abroad were to be taken into account. The effect was that local and export trade were distributed among manufacturers in equitable proportions. The Committee fixed basic prices and equalised returns to factories through an Equalisation Fund.

Until June 1975 a subsidy was provided by the Commonwealth Government for butterfat used in the production of butter and cheese. The subsidy in the final year of payment, 1974-75, was \$45.00 per tonne on butter and \$21.46 on cheese. A subsidy available under the *Processed Milk Products Bounty Act* 1962 on exports of processed milk products (excluding butter, cheese and certain other specified goods) also ceased on the above date. Some financial assistance has been provided in the period subsequent to June 1975 by Commonwealth Government underwriting of the equalisation price of a wide variety of processed milk products. The prices to be underwritten were determined after wide discussion between the government and representatives of the dairy industry based on guidelines produced by the Bureau of Agricultural Economics.

After investigation into the state of the dairy industry and the type of assistance which should be provided, the Industries Assistance Commission made certain recommendations in its report of September 1976. The recommendations were for a three-tiered compulsory stabilisation scheme to be operated by the Australian Dairy Corporation.

The *Dairy Industry Stabilization Act* 1977 and related legislation provided for the implementation of Stage I, essentially a compulsory levy-disbursement scheme, from 1 July 1977. This replaced the previous voluntary equalisation scheme administered by the Commonwealth Dairy Produce Equalisation Committee Ltd and is expected to have results similar to those attained under the voluntary scheme.

The Commonwealth Dairy Produce Equalisation Committee Ltd continued in existence until 30 June 1978, having at that date finalised all equalisations of product pools for which it had been responsible.

Stages II and III of the compulsory scheme have not been introduced owing to reduced milk production and much lower exportable surpluses.

Previous underwriting arrangements, recommended by the Industries Assistance Commission to be maintained on a short term basis, have been continued by the Commonwealth Government.

The following table shows the numbers of cattle kept for milk production on agricultural establishments at 31 March 1975 to 1980. From a total of 240,338 at 31 March 1963 the numbers have declined to 127,557 at 31 March 1980.

CATTLE FOR MILK PRODUCTION

Particulars	At 31 March —					
	1975	1976	1977	1978	1979	1980
	number	number	number	number	number	number
Bulls of dairy breeds used or intended for service —						
Aged one year and over	2,367	2,409	r 2,239	1,802	r 1,328	1,285
Calves (aged under one year)	831	1,078	r 1,199	1,111	456	435
Total	3,198	3,487	r 3,438	2,913	r 1,784	1,720
Cattle used or intended for production of —						
Milk or cream for sale —						
Cows — In milk and dry	91,079	93,188	r 83,518	74,107	72,298	71,541
Heifers — Aged one year and over	37,277	35,747	r 33,264	29,473	26,824	27,671
Heifer calves — Aged under one year	30,924	29,188	26,111	22,395	22,842	22,683
Milk or cream for use on agricultural establishments —						
House cows and heifers	5,737	5,916	5,590	5,221	r 4,239	3,942
Total	165,017	164,039	r 148,483	131,196	r 126,203	125,837
Total cattle for milk production	168,215	167,526	r 151,921	134,109	r 127,987	127,557

The level of assistance applicable to the production period commencing 1 July 1980 enabled manufacturers to pay their suppliers an initial payment of \$2.18 per kilogram butterfat at place of production. This sum is made up of \$1.91 of pool proceeds subject to underwriting cover and 27 cents per kilogram initial support from the Dairy Industry Authority. The Authority placed a further 2 cents per kilogram into a fund for purposes of stabilising payments to suppliers made by manufacturers with respect to periodic increases in disbursements made from the Dairy Products Stabilisation Trust Fund.

In the next table, the number of establishments carrying cattle for milk production at 31 March 1980 are classified by the size of the herds. Herds of less than ten cattle for milk production accounted for 70 per cent of herds but only 3 per cent of the total number of such cattle. Establishments carrying 100 or more cattle for milk production accounted for only 23 per cent of herds but 91 per cent of the total cattle for milk production at that date.

CATTLE FOR MILK PRODUCTION AT 31 MARCH 1980  
CLASSIFIED ACCORDING TO SIZE OF HERD

Size of herd (numbers)	Number of herds	Total cattle
1 — 9	1,618	3,628
10 — 19	36	472
20 — 29	22	526
30 — 39	14	481
40 — 49	18	803
50 — 59	11	602
60 — 69	10	634
70 — 79	16	1,185
80 — 89	14	1,197
90 — 99	26	2,463
100 — 124	69	7,752
125 — 149	91	12,510
150 — 174	80	12,871
175 — 199	56	10,392
200 — 249	113	25,014
250 and over	134	47,027
Total	2,328	127,557

The quantity and gross value of whole milk produced in each of the years 1974-75 to 1979-80 are given in the following table.

WHOLE MILK PRODUCTION (a)

Particulars		1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Quantity	'000 litres	245,895	232,265	214,851	212,228	212,918	216,477
Gross value (b)	\$'000	20,458	20,660	23,274	29,925	36,549	41,865

(a) Year ended 30 June. Includes milk used for processing into butter, cheese and condensery products. Details of butter production appear in Part 3 of this Chapter. (b) Includes subsidy paid by the Commonwealth Government.

### PIG RAISING

The principal pig raising districts are the Upper Great Southern, Lower Great Southern and Midlands Statistical Divisions. At 31 March 1980 69 per cent of pigs were within these divisions. In the Perth and South-West Statistical Divisions there are a number of large intensive piggeries and, together with some smaller holdings, these accounted for 21 per cent of pigs.

The principal breeds in Western Australia are the Large White, Berkshire and Landrace and crosses of these breeds. Pigs are reared for bacon and ham as well as pork and may be sold for slaughter at Midland saleyard or a number of country auctions. Alternatively, major processors offer an advance price schedule based on a weight and grade system. Although the greater proportion of production is consumed locally, there is some export trade. In 1979-80 a total of 190,166 kilograms of pork was shipped interstate and 203,641 kilograms overseas.

In the following table, pig herds at 31 March 1980 are classified according to the size of the herd. Establishments carrying less than fifty pigs accounted for 49 per cent of the total herds but only 10 per cent of the total number of pigs. Herds containing between fifty and 499 pigs accounted for 48 per cent of herds and 59 per cent of total pigs while those with more than 500 pigs accounted for only 3 per cent of herds but almost 31 per cent of pigs.

PIG HERDS AT 31 MARCH 1980  
CLASSIFIED ACCORDING TO SIZE OF HERD

Size of herd (numbers)	Number of of herds	Total pigs
1 — 9	304	1,426
10 — 19	279	4,014
20 — 29	226	5,582
30 — 39	250	8,519
40 — 49	212	9,402
50 — 69	279	16,330
70 — 99	310	25,763
100 — 149	280	34,062
150 — 199	138	23,619
200 — 299	138	32,893
300 — 499	109	41,136
500 — 699	30	17,957
700 — 999	29	23,936
1,000 and over	23	48,279
Total	2,607	292,918

In the table below, the numbers of pigs on agricultural establishments at 31 March are shown for each of the years 1975 to 1980. The number of pigs reported at 31 March 1979 showed the first increase since 1973. A further increase of 8 per cent was recorded at 31 March 1980.

PIG NUMBERS

At 31 March —	Boars	Breeding sows	Other pigs	Total
1975	4,175	37,243	222,739	264,157
1976	4,093	37,260	218,498	259,851
1977	3,921	35,396	202,799	242,116
1978	3,881	35,780	197,697	237,358
1979	4,013	40,493	226,984	271,490
1980	4,431	43,892	244,595	292,918

The next table shows the numbers and gross value of pigs slaughtered in each of the years 1974-75 to 1979-80, together with the quantity of meat produced. Factory production of bacon and ham is also shown.

PIGS SLAUGHTERED (a) AND MEAT PRODUCED

Year	Pigs slaughtered		Pigmeat produced (c)	Bacon and ham produced (d)
	Number	Gross value (b)		
		\$'000	tonnes	tonnes
1974-75	391,304	16,936	22,078	5,279
1975-76	354,204	18,211	19,832	5,368
1976-77	345,175	18,348	19,671	5,873
1977-78	322,781	18,994	18,170	5,625
1978-79	328,561	r 21,500	r 17,973	5,604
1979-80	381,300	27,205	21,285	5,930

(a) Comprises slaughterings in abattoirs, butcheries and on stations and farms. (b) Value 'on hoof' at principal market or at factory door. (c) Dressed carcass weight; excludes condemned carcasses and offal but includes quantities used to produce bacon and ham. (d) Factory production.

## LIVESTOCK IN AUSTRALIA

The following table gives details of livestock numbers in each State and Territory of Australia at 31 March 1980.

LIVESTOCK NUMBERS AT 31 MARCH 1980 — AUSTRALIA  
(‘000)

State or Territory	Cattle				Total	Pigs
	Sheep	Bulls (1 year and over) used or intended for service	For production of milk or cream	Mainly for meat production		
New South Wales	48,600	107	480	5,511	6,099	830
Victoria	24,400	86	1,502	2,664	4,252	422
Queensland	12,163	174	370	9,788	10,332	510
South Australia	16,046	24	155	888	1,067	398
Western Australia	30,431	42	127	1,897	2,065	293
Tasmania	4,245	12	154	483	649	63
Northern Territory	1	40	—	1,690	1,730	3
Australian Capital Territory	98	—	—	13	14	—
AUSTRALIA	135,985	484	2,788	22,936	26,208	2,519

## POULTRY FARMING

Poultry farming in Western Australia is now a specialised industry located almost entirely within the Perth Statistical Division. A few commercial egg farms are established in the more populous country areas.

Almost all the egg production and a large proportion of the chicken meat production is on family farms which specialise in the production of either poultry meat or eggs. There are a significant number of company farms producing chicken meat. A few laying birds are kept for commercial production on orchards, dairy farms and wheat farms throughout the agricultural areas.

The Western Australian Egg Marketing Board, constituted under the *Marketing of Eggs Act 1945-1977*, is the statutory authority controlling the commercial production of eggs. The Board is responsible for the collection, handling, examination, grading, treatment, storage, distribution and sale of eggs. From time to time the Board fixes the maximum price at which each respective grade of eggs may be sold by retail.

The State's level of egg production is controlled by the licensing of producers. Under the Act it is an offence to keep, for the purpose of producing eggs for sale, more than twenty fowls unless the person is the holder of a licence to keep laying fowls. The licence authorises the number of fowls the holder may keep.

Annual local consumption is about sixteen million dozen eggs, and demand is expected to increase 2 to 3 per cent per year.

Egg production has consistently exceeded local requirements and the surplus is sold overseas. The export of eggs has been unprofitable since the collapse of the United Kingdom market during the mid 1950s. In order to provide a fund with which to equalise returns from local and export sales the Board, prior to 1 July 1965, made a charge on all eggs sold locally. This charge was subsequently replaced by a levy imposed by Commonwealth legislation which came into operation on 1 July 1965.

The *Poultry Industry Levy Act 1965* provides for the imposition throughout Australia of a levy on hens not less than six months old kept for commercial purposes. Special exemptions are made in respect of 'broiler breeder hens', being hens used to produce chickens for table purposes. The levy, which does not apply to flocks of fewer than twenty-one hens, nor to the first twenty hens in any flock, is payable fortnightly and may not exceed \$2 annually per bird. In December 1980 the levy stood at 7.5c per fortnight for each hen.

Under the *Poultry Industry Levy Collection Act 1965* the authority responsible for the collection of the levy in this State is the Western Australian Egg Marketing Board. The *Poultry Industry Assistance Act 1965* establishes a Poultry Industry Trust Fund for the receipt of the amount of the levy and other moneys. The Act provides for payment from the Fund to a State, by way of financial assistance, of such amounts as the Commonwealth Minister may determine upon the recommendation of The Council of Egg Marketing Authorities of Australia.

Although the Commonwealth Government levy replaces the egg equalisation levies formerly imposed by the several State authorities for the purpose of equalising returns from local markets and export sales, the State authorities continue to make charges necessary to defray the costs of handling, grading and marketing of eggs.

In 1979-80 Christmas Island and Hong Kong were the most important overseas markets for eggs in the shell. Overseas exports of eggs in liquid form (including frozen pulp) in 1979-80 were valued at \$183,713.

Production of chicken meat has increased considerably in recent years. Between 1973-74 and 1979-80 slaughterings of meat chickens rose from 14.0 million to slightly less than 19.0 million, and this rate of increase is expected to continue.

Under the *Chicken Meat Industry Act 1977*, a person growing meat chickens in batches of more than one thousand for supply or sale to a processor is required to have a contract or broiler growing agreement with that processor.

The form of the agreement is prescribed by regulation.

This legislation was designed to give growers a security of contract, a fair price and the opportunity to share in expansion of the industry.

The Chicken Meat Industry Committee, constituted under the *Chicken Meat Industry Act 1975* (repealed), is continued under this new Act and in addition to attending to general industry matters is responsible for determining the standard price to be paid to growers for broiler chickens, and settling disputes which may arise out of agreements. An arbitrator is appointed if the Committee is unable to reach agreement on the determination of the standard price or the dispute.

Details of poultry numbers in the State at 31 March of the years 1975 to 1980 are given in the next table. The succeeding table shows eggs sold and poultry slaughtered for table purposes over the six years ended 1980.

#### POULTRY NUMBERS

At 31 March —	Fowls	Ducks	Turkeys
1975	3,884,171	31,189	2,819
1976	3,616,771	15,304	4,806
1977	3,512,476	2,992	3,017
1978	4,030,930	2,753	1,126
1979	3,780,394	1,180	5,511
1980	3,952,084	5,018	1,401

#### EGG PRODUCTION AND POULTRY SLAUGHTERED (a) FOR TABLE PURPOSES

Year ended 31 March —	Egg production (b)		Poultry slaughtered for table purposes (c)	
	Quantity	Gross value	Dressed weight	Gross value
	'000 dozen	\$'000	tonnes	\$'000
1975	16,973	12,032	17,714	12,428
1976	16,320	13,431	19,457	13,865
1977	15,118	14,037	20,513	16,004
1978	15,533	15,477	21,949	19,770
1979	15,706	16,310	23,571	22,536
1980	15,724	17,283	24,176	26,274

(a) Excludes non-commercial production.  
Board.

(b) Source: Western Australian Egg Marketing

(c) Year ended 30 June.

## BEEKEEPING

Commercial producers of honey in Western Australia may be divided into three categories. There are a comparatively small number of specialist apiarists, engaged solely or mainly in honey production, who operate on a large scale and transport their hives from district to district. There are also some substantial producers who are engaged in agricultural activities and use their farms as a central site from which they may transport their hives to other areas as necessary. Finally there are the many farmers and orchardists who keep a few hives and produce honey as a minor supplementary activity.

## BEEKEEPERS, BEEHIVES AND HONEY PRODUCTION (a) — 1979-80

Classification of hives (a)	Beekeepers (b)		Productive beehives (c)		Honey production	
	Number	Proportion of total (per cent)	Number	Proportion of total (per cent)	Quantity (kg)	Proportion of total (per cent)
40 — 99	60	34.68	2,427	7.09	85,760	3.27
100 — 199	37	21.39	3,621	10.58	160,743	6.13
200 — 299	18	10.40	3,306	9.66	224,735	8.57
300 — 499	37	21.39	12,452	36.38	976,412	37.22
500 — 799	14	8.09	6,493	18.97	703,207	26.80
800 and over	7	4.05	5,930	17.32	472,845	18.02
Total	173	100.00	34,229	100.00	2,623,702	100.00

(a) Excludes details of beekeepers with less than 40 hives. (b) At 30 June 1980. (c) Represents the number of hives at 30 June 1980 from which honey was taken during the year and excludes hives kept for production but from which no honey was taken, nuclei, pollination hives, etc.

## BEEHIVES AND PRODUCTION OF HONEY AND BEESWAX (a)

Year	Beehives (b)		Honey production		Beeswax production	
	Productive (c)	Unproductive (d)	Quantity	Gross value	Quantity	Gross value
	number	number	tonnes	\$'000	tonnes	\$'000
1974-75	33,794	4,883	2,527	935	36	65
1975-76	34,069	5,346	3,354	1,174	53	89
1976-77	36,483	6,083	3,143	1,603	49	123
1977-78	32,378	8,930	1,468	763	27	96
1978-79	30,529	8,129	1,841	1,418	35	114
1979-80	34,229	7,838	2,624	1,837	51	199

(a) Excludes particulars of beekeepers with less than 40 hives. (b) Number at 30 June. (c) Hives from which honey was taken during the year. (d) Includes hives kept for production but from which no honey was taken during the year, nuclei, pollination hives, etc.

In 1979-80 exports of honey totalled 1,367 tonnes, the export value being \$1,700,456. The principal buyers were the Federal Republic of Germany, which purchased 524 tonnes; the Republic of Singapore, 206 tonnes; and the United Kingdom, 161 tonnes.

## THE DEPARTMENT OF AGRICULTURE

A Bureau of Agriculture formed in 1894, became the Department of Agriculture in 1898 when the cleared, arable land in Western Australia was less than 1 per cent of present farm land, no superphosphate was used in Western Australian farming and no wheat varieties were available for the drier areas more than 100 kilometres inland.

In the Department's first twenty-five years, development of the wheat belt was the main activity. The area under cereal crop increased from 30,000 hectares in 1900 to more than 1.6 million hectares in 1930 and 4.8 million hectares in 1977-78.

In the Department's first ten or fifteen years, experiment farms, or 'State farms' were established. The first of these had its origin in plots which were established at Hamel in 1896. Valuable work was carried on at this centre for nearly twenty years in connection with growing of potatoes, fruit, cereals, hops, fodder crops and pasture, and some success was achieved with wheat breeding.



Government farms were opened at Narrogin in 1901 and at Nabawa, forty kilometres north of Geraldton, in 1902. In 1907 a farm at Nangeenan, near Merredin, was taken over from the Lands Department and is now the Merredin Research Station. In the same year a farm was established in the south-west at Brunswick in order to provide object lessons in dairying, as it was felt there were great possibilities of expanding the dairying industry. After functioning for several years this farm was closed and the land was subsequently used for closer settlement purposes.

In 1911 a change was made in the policy of the government farms in the wheat belt and their character changed from 'experimental' to 'experiment' farms and ultimately to 'research stations'. Instead of being conducted mainly with the object of producing revenue they were to be used primarily for collecting information concerning local conditions that would be of value to the district. In addition, wheat, oats and barley were bred and pure pedigree seed produced.

The Department of Agriculture, which has expanded progressively, has a broad role to foster the State's agriculture and the overseas marketing of its products. By representation on the Australian Agricultural Council, it helps establish nationally acceptable policies.

It is the branch of the State Government service which brings scientific advice to farmers, pastoralists and allied industries, conducts a wide range of research and administers relevant Acts of Parliament. It maintains services to assist farmers and its regulatory work consists of carrying out the provisions of some of the laws relating to agriculture.

The operations of the Department are organised into Divisions, Sections or Branches, the heads of which are responsible to the Director of Agriculture, through the Deputy Director and two Assistant Directors.

The Animal Health Division comprises veterinary services, stock and abattoir inspection, animal health laboratories, stock branding and stock movement. The Animal Production Division has separate Branches or Sections dealing with beef cattle, dairy cattle, sheep and wool, pigs, poultry, carcass classification and apiculture. It also is responsible for several research stations. Responsibility for quality control of dairy products and food technology research and extension is the function of the Dairying and Food Technology Division.

The Plant Research Division deals with plant nutrition, crop and pasture agronomy and has Branches or Sections for plant pathology, weed agronomy and biometrics. A diagnostic plant analysis service which uses a multi-channel spectrometer is operated by the Division.

Plant breeding, the quality testing of cereals and other seeds, seed products and grain inspection services, and responsibility for many of the Department's research stations is the function of the Plant Production Division. The greater part of the Department's extension services and country district offices are within the Regional Services Division which provides an overall advisory service to farmers, except for specialist veterinary services and horticultural advice.

The Resource Management Division comprises several Branches dealing with rangeland management (the pastoral industries), soil conservation, soil research and surveys, and irrigation and drainage. The functions of the Horticulture Division are the responsibility of Sections dealing with fruit, vegetables, viticulture, floriculture, and the horticultural inspection services. The Division also administers several research stations.

The Administration Division comprises the Branches or Sections of Botany (the Western Australian Herbarium), Entomology, Information, Marketing and Economics, and the Library. In addition to these the Division includes the Kimberley District Office and the Kununurra Experimental Farm.

Close liaison is maintained with the Agricultural Protection Board.

The Head Office at South Perth houses the main administrative, research specialist and diagnostic staff and there are twenty-four district offices and twenty-four research

stations. Most research stations are for the wheat and sheep, beef, and dairying industries but specific stations cater for fruit, vegetables, poultry, pigs, viticulture and tropical agriculture. An Animal Breeding and Research Institute was established at Katanning in 1980.

### Research activities

Investigation and research work is a major function of the Department and has meant much to the State's farming. Cereal breeding and economic assessment of varieties is a continuing process in which more than 6,000 trial plots are planted each year. Cereal varieties bred by the Department have increased the incomes of farmers by many millions of dollars in the years they have been grown. The introduction of new plant species and varieties (including rust-resistant types), the determination of crop rotations for improving yields and maintaining soil fertility, as well as ways to improve district performance and profitability are all part of the investigation and research work.

Research into plant diseases, deficiencies and fertiliser needs are important aspects of the Department's work and success in this field made possible the extensive expansion of farming into light land in the past three decades. The sowing of lupins to provide nitrogen, and the use of trace elements were major factors in developing the sandy soils; the establishment of new subterranean clover species in areas of light rainfall, made possible the ley farming system of cropping in rotation with pastures which greatly expanded the productivity of the State's dry land farming.

Many specific problems and deficiencies have been investigated. Recent important examples are lupinosis disease in sheep, annual ryegrass toxicity, clover scorch and blackleg in rape. Breeding new cultivars is the long term answer to some of these problems and good progress has been made. Sweet lupins are grown for their high protein grain and have become an important field crop. Many research projects are joint efforts between different Divisions. Space precludes a list of all research effort but animal health and nutrition, weed control and efficient beef, dairy, chicken meat, egg and pig production are part of the constant research stream. Research by the Beef Branch and Carcase Classification Section has originated a commercial system of continuous on-line descriptive classification of beef carcasses in abattoirs. This development is important in the evaluation of carcasses for both producers and the meat industry and the system is being tested in abattoirs throughout Australia. The pig carcass classification system introduced by the Department in 1977 has already resulted in a marked improvement in the quality of pigs produced in Western Australia.

In the horticultural industries, research has enabled commercial growers to maintain and expand production in the face of diminishing numbers of growers. This has been achieved by the introduction of new varieties and rootstocks and the development of management techniques to increase quality and yields well above previous levels.

Disease in farm animals is of major economic significance to the agricultural industry, both in its clinical and sub-clinical manifestations. Disease can be due to bacterial and viral infections, parasitic infestations of a wide variety of types, the ingestion of toxic plants and other toxic substances, specific nutritional deficiencies such as selenium, copper, cobalt and vitamin E, inborn errors of metabolism such as Mannosidosis and Glycogenosis, and disorders in metabolism producing diseases such as Hypomagnesaemia and pregnancy toxemia.

The Department provides a diagnostic service for food producing animals in all the areas mentioned above, and, in addition, carries out research into those diseases which are of greatest significance. Notable achievements have been made in the areas of annual ryegrass toxicity, lupinosis, the eradication of brucellosis and tuberculosis from our cattle herds, the development of a more objective approach to the prevention of parasitic gastroenteritis in cattle and sheep and in gaining a better understanding of the role of vitamin E in weaner sheep myopathy.

Research in food technology has been directed at developing improved processing methods and better utilisation of produce, especially in relation to sheep meat, abattoir by-products, dairy products and alternatives to fossil fuels, such as vegetable oils.

A soil conservation service was established in the Department in 1947 and since then much information on the incidence and nature of erosion has been collected. Soil losses by water and wind erosion are widespread, particularly in the cereal growing areas. The main thrust of the soil conservation research programme relates to the magnitude of soil loss and its effect on productivity. Studies of the surface hydrology of farmland catchments aim to provide more information relevant to water erosion control and flooding problems. A considerable area of agricultural land has suffered from salt encroachment since clearing. Over 260,000 hectares of once productive land has become too saline for cropping. The Department has carried out considerable research into the reasons for salt encroachment and the measures that can be taken to improve the productivity of saline land. The provision of water supplies in many rural areas has been difficult. Research has developed various means of improved water conservation by the use of roaded catchments and techniques of dam sealing and design. Although the main emphasis has been on soil and water conservation in agricultural areas, an increasing amount of research is being carried out concerning the wider aspects of environmental protection, often in co-operation with other Government Departments. Examples include coastal and river protection, studying and reducing the impact of industrial and urban development and examining possible consequences of activities such as the wood chip industry and the mining of mineral sands.

The Department is responsible for carrying out surveys of rangeland condition and erosion in the pastoral areas and provides maps and descriptions of the resource base of leasehold land. The work is done in collaboration with the Department of Lands and Surveys.

In the north-west of the State the sheep-carrying capacity of large tracts of country has been seriously reduced by drought and overgrazing. Officers of the Department have shown that much of this country can be improved by adopting systems of grazing management different from those of the past.

Lupin growing and the production of sheep meat for Middle East markets are two successful agricultural enterprises with which the Department has been closely associated in recent years. Research is also establishing lupins as a source of protein in feeds manufactured for the poultry, pig, sheep and cattle industries. The Department has been engaged in developing management and breeding systems to help satisfy the new market requirements, advising on feeding and accommodation during shipping and discussing market requirements with importers.

The Department has transferred its Ord Irrigation Area research work to the Kununurra Experimental Farm from the Kimberley Research Station, formerly operated in conjunction with the Commonwealth Scientific and Industrial Research Organization. Research is focused on irrigation row crops for tropical areas — sugar cane, rice, oilseeds, legumes, cereals and pharmaceutical crops. At the pilot sugar cane farm, harvestings between May and September 1979 gave high yields of cane and sugar. A highlight was a yield of 27.2 tonnes of sugar per hectare on a six-hectare plot of an experimental cane variety.

At Carnarvon the main emphasis is on out-of-season winter vegetables for the Perth market. At the Gascoyne Research Station in Carnarvon, the Department assists growers with research into disease, pest and weed control, variety selection, cultural and irrigation methods, and packaging, marketing and economic developments.

Rangeland management and beef production research is conducted from Derby and Kununurra on various properties, including the adjacent Ord River and Fox River stations, the site of a massive million-hectare regeneration project conducted by the Department. Other rangeland research is carried out on individual properties throughout the pastoral areas.

The Western Australian Herbarium conducts research into the flora and vegetation of the State. The work is primarily in taxonomy, but studies in ecology, anatomy and cytology are also undertaken.

#### **Advisory services**

Extension work is perhaps the Department's most important function and has exercised a powerful influence in publicising and accelerating the adoption of better farming methods. Besides making individual visits to a property where a specific request has been made or where some urgent action is required, extension officers support the formation of farmers' organisations and attend meetings and field days where talks are given to groups of farmers. Many such meetings are held on the Department's research stations but field experiments and demonstrations on farmers' properties also provide venues for extension. Major problems such as farm management, taxation and fertilisers are commonly discussed, along with current difficulties with husbandry practices. Besides such personal contacts, many of the Department's twenty-four district advisory offices send newsletters to farmers in their areas.

Mass media play an important role in extension and about 200 radio broadcasts are given by departmental officers each year. A weekly Press service is also provided and regular publications include the quarterly *Journal of Agricultural* which is distributed to more than 5,000 farmers, the quarterly *Dairy Notes* which reaches all the State's dairy farmers, a farm Bulletin series, and a *Rangeland Bulletin* for the State's pastoralists. Additions to these services have been *Technotes* (an internal technical advisory service), *Farmnotes* and *Market Information Service*. Since 1968, the Department has made twenty half-hour programmes per year for televising to South-West and Great Southern farmers.

Advisory work is largely the function of the Regional Services Division although other Divisions and Branches or Sections of the Department are involved in this activity. Apart from specialist services available from the Department's Head Office at South Perth, advice relevant to country areas is available from officers stationed at district offices at Bridgetown, Busselton, Carnarvon, Derby, Esperance, Geraldton, Harvey, Jerramungup, Kalgoorlie, Katanning, Kununurra, Lake Grace, Manjimup, Meekatharra, Merredin, Midland, Moora, Narrogin, Northam and Three Springs. There has been decentralisation of some services, such as diagnostic tests, to larger regional offices at Albany and Bunbury. The district office at the port of Fremantle is mainly concerned with inspection and quarantine services.

The extension and advisory work of the Herbarium, while it is to a large degree involved in agriculture, is also directed to other activities concerning the utilization and management of the State's flora, including forestry and wildlife research. Research findings not related to agriculture are published in *Nuytsia* and *Western Australian Herbarium Research Notes*.

#### **Other services**

Since 1970, and at a cost of \$9.14 million (\$6.14 million Commonwealth, \$3.00 million State) the Department has progressed strongly in the eradication of brucellosis and bovine tuberculosis from Western Australian cattle. By January 1981 there were 1,632 herds comprising 257,592 head in the Brucellosis Certified Free Scheme, and of a State total of 9,413 herds only 649 had not yet been assessed. The number of properties in quarantine was reduced to fewer than thirty. At the conclusion of a comprehensive 10-year programme of investigation consisting of testing samples from more than 300,000 Kimberley cattle and demonstrating that the disease was not present, the entire Kimberley region was declared a brucellosis free area early in 1980. The remainder of the State is expected to be declared provisionally free of brucellosis by early 1982. Except for the Kimberleys and a small area of the inland north, Western Australia is provisionally free of bovine tuberculosis allowing free passage of cattle traded interstate.

The Department's Animal Health Division has also greatly assisted the increased export of live sheep in the past few years by inspection and the issue of health certification.

The Department operates certain services which assist the producer to increase his efficiency. Probably the best known is the production of pure pedigree varieties of seed wheat, oats and barley. These are of value to the cereal grower, who is able to obtain his requirements at moderate cost. Sponsoring and supervising the production of approved lines of seed, notably potatoes and beans, has led to the wide use of these specialised lines with a resulting increased yield, and certification of pure lines of pasture seed gives farmers a guarantee of quality in the seed they buy. A dairy herd recording scheme is administered and subsidised. This enables farmers to gauge the milk yield and mastitis status of individual cows. The central laboratory at Bunbury has enabled an extension of the service and 43 per cent of dairy farms are now covered by the scheme. Determinations of the digestibility of hay and other feedstuffs are also carried out. Milking machines on dairy farms are checked for correct working as a free service. Assistance and technical advice is given to farmers concerned with the installation of irrigation schemes and the preparation of land for irrigation.

A superphosphate application rate prediction service is now available to help farmers decide the best rates of application of superphosphate for their crops and pastures based on previous fertiliser history and on soil test. The service uses the 'Decide' method of superphosphate prediction, developed in co-operation with the Commonwealth Scientific and Industrial Research Organization.

### **Avondale Project**

At the historic Avondale Research Station, Beverley, the Avondale Project dealing with the development of agriculture was created as one of the contributions by the Department to the State's 150th Year Celebrations held in 1979. Officially opened by His Royal Highness, The Prince of Wales, the Project features a fauna and flora reserve, a cultivar garden of historic crop and pasture plants, sheep and cattle displays of breed types found in Western Australia and probably the largest technological collection of farm machinery and artifacts, which have been important to the development of the State's agriculture since settlement in 1829. The Project includes the restoration of the original Avondale stables and homestead, built in the last century. The homestead has been furnished to the period 1900, and Clydesdale horses have been re-introduced. The Station is open to the public.

### **Administration of Acts**

The Department of Agriculture is responsible for administering sixty Acts concerning a wide range of subjects. Some of the more important relate to animal and plant disease and insect pests, industry trusts funds, soil conservation, regulations of the dairy industry, vermin control, marketing of agricultural products and registration of feeding stuffs, fertilisers and stock brands.

The Department operates an integrated inspection service to provide quarantine protection for animal, horticultural, agricultural and forest industries against the importation and spread of plant pests and diseases from overseas as well as interstate, and to maintain quality standards of fruit and vegetables supplied to the local market and for shipment overseas. The properties of milk and dairy produce are kept under constant surveillance to ensure the best possible quality to the consumer.

## **AGRICULTURE PROTECTION**

The Agriculture Protection Board is the body responsible for seeing that the State's agricultural resources are protected from the sometimes devastating effects of certain plant and animal pests.

The Board consists of the Director of Agriculture as Chairman, the Chief Executive Officer as Deputy Chairman, an officer of the State Treasury, two representatives of the Primary Industry Association, one representative of the Pastoralists' and Graziers' Association and five representatives of the Country Shire Councils' Association of W.A.

New legislation affecting the Board's operation was passed in 1976. This was the Agriculture and Related Resources Protection Act which replaced the Noxious Weeds Act and the Vermin Act. Under the new Act, plants formerly called noxious weeds can be declared by the Board to be 'declared plants' and the former vermin to be 'declared animals' for the purposes of the Act.

Responsibility for controlling these declared plants, or declared animals rests with the occupier of land, whether this be a private individual or company, a local government authority, or a government department. The Agriculture Protection Board's role is to co-ordinate the control effort and see that declared plants and declared animals are dealt with according to its policies. The new legislation provides for local policies to be formulated by Zone Control Authorities on the advice of Regional Advisory Committees. The authorities and committees are made up of farmers, pastoralists and Shire Councillors from each region.

As well as co-ordinating overall agriculture protection policies, the Board advises on methods of control, maintains services to prevent pest animals and plants entering the State, and conducts research into the biology and control of vetebrate pests. The Board also has an operational contract service which landholders can use if they wish to carry out control work.

#### ADVISORY COMMITTEES

Responsibility for advising the Minister for Agriculture on the growing and marketing of the most suitable types of wheat, coarse grain and seeds lies with two bodies — the State Wheat Advisory Committee and the State Coarse Grains and Seeds Advisory Committee. These two committees, which have similar functions are constituted with the aims of improving the grain quality in Western Australia and the issuing annually of a list of recommended varieties as a guide to farmers in Western Australia. Membership of the two committees covers a wide range of interests, including producers, processors, bulk handling and storage authorities, exporters and research institutions. Secretarial and technical functions are undertaken by the Department of Agriculture.

In preparing lists of recommended varieties the committees take into account such factors as average yields per hectare from variety trials carried out by the Department of Agriculture on research stations and farmers' properties and analyses of grain and flour undertaken in Department of Agriculture laboratories and by the Bread Research Institute in Sydney.

The State Soil Conservation Advisory Committee was appointed under the provisions of the *Soil Conservation Act 1945-1974*, for the purpose of supporting and advising the Commissioner of Soil Conservation and the Minister for Agriculture.

The Committee consists of the Commissioner (*ex officio*), six officers representing the Departments of Agriculture, Lands and Surveys, Public Works, Mines, Forests, and Main Roads, one person representing the interests of local government authorities, and four persons representing persons engaged in agricultural and pastoral pursuits.

#### ARTIFICIAL BREEDING BOARD

The Artificial Breeding Board, established in December 1966, under the provisions of the *Artificial Breeding Board Act 1965*, consists of an independent chairman, two representatives of The Primary Industry Association of Western Australia (Inc.), one representative of The Royal Agricultural Society of Western Australia and a veterinary surgeon.

The Artificial Breeding Board Act charges the Board with the responsibility of promoting and developing artificial breeding practices and services. This began when the Board took over the artificial insemination services established by the Department of Agriculture in 1956.

In February 1977 the Board embarked upon a scheme of extensive training of farmers in artificial insemination techniques to inseminate cows in their individual herds — a scheme intended to replace the need for the Artificial Breeding Board's daily insemination service. The transition to a total regime of insemination by herdsmen was completed by mid 1979.

The Artificial Breeding Board provides semen delivery services to the major towns of most cattle breeding districts within the South West Land Division, also farm to farm deliveries to the south-west dairy and beef producers.

Semen stocks maintained at the Board's Administration and Distribution Centre located at Harvey originate from all available areas around the world. Extensive in-store stocks provide breeders with a selective range of sires in each breed. Semen is currently available from eight dairy breeds and thirty-nine beef breeds.

Artificial breeding is increasingly recognised as a reliable means of expanding genetic selection for herd improvement.

#### FARM MANAGEMENT SERVICE LABORATORY

The University of Western Australia, by resolution of the Senate, approved the establishment of the Farm Management Service Laboratory within the University in 1966. The aims of the Laboratory are to develop concepts and services in management accounting, computer planning and animal breeding which are specially suited to the needs of farmers; to make these developments available to farmers; and to use information processed by the Laboratory for teaching and research at the University of Western Australia.

The Laboratory hires its own staff and computer time, and pays its own operating expenses. Fees are charged to cover costs, though initially the Laboratory drew on capital grants made to it by various firms and institutions through the John Thomson Agricultural Economics Centre at the Institute of Agriculture.

Services provided by the Laboratory include computer techniques for planning farm business and solving farm problems. A set of programmes has been developed to enable farmers to breed at least cost for maximum genetic improvement of economically important traits in sheep flocks and pig and beef herds.

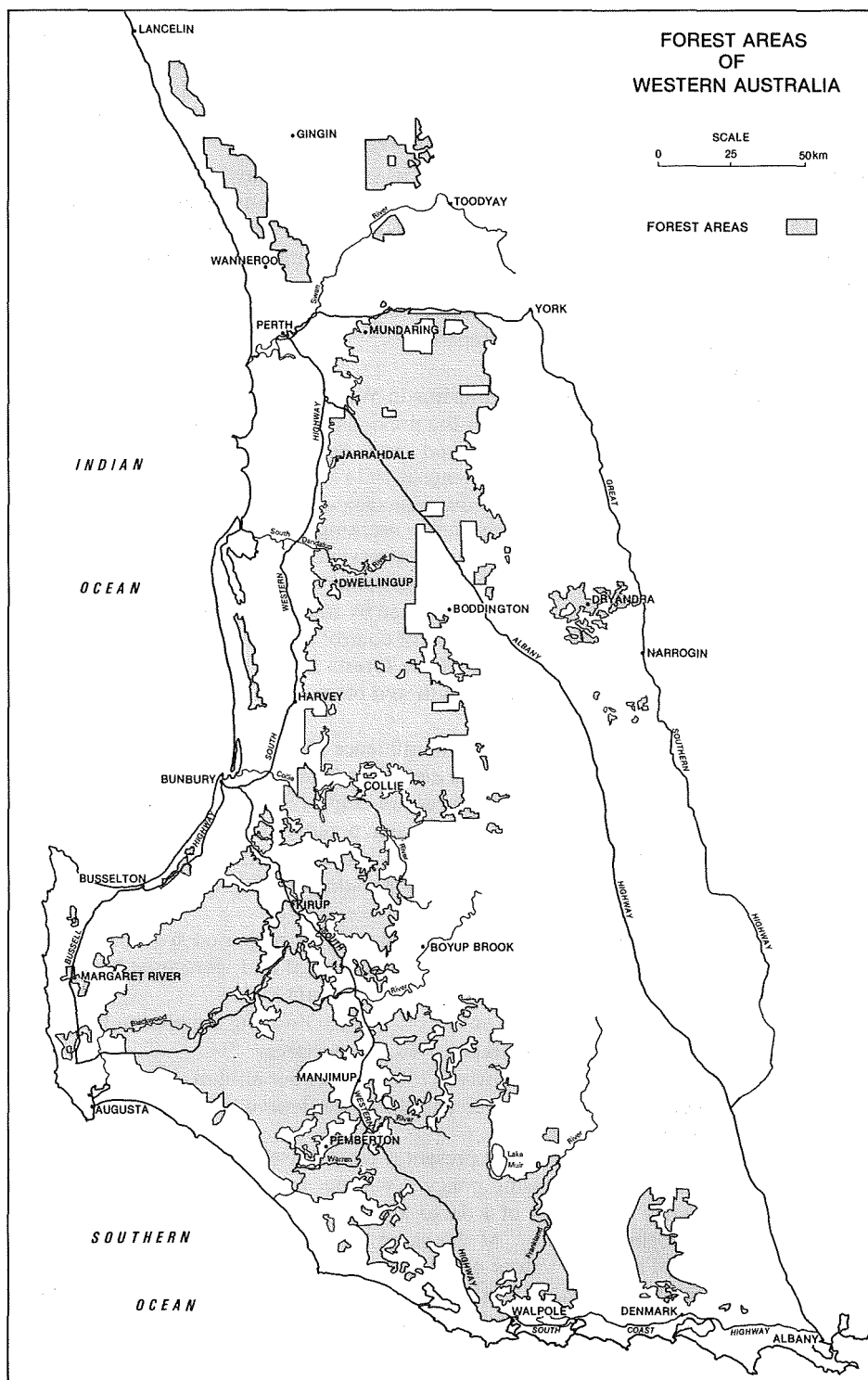
#### FORESTRY

##### The Prime Indigenous Forests

Although the prime indigenous forests of Western Australia cover only a small percentage of the area of the State, they are of considerable economic importance. This is not only on account of the durability, strength and general-purpose nature of their hardwood timbers, but also because of their occurrence in the water catchment areas in the high-rainfall and closely-populated section of the State. Being easy to regenerate after cutting, they form a natural and effective protection against soil erosion and provide for the increasing public demand for forest recreation. More than 1.8 million hectares have been permanently dedicated as State Forests and 363,257 hectares of forest land are held as Timber Reserves under the Forests Act and the Land Act.

Jarrah (*Eucalyptus marginata*) is the State's principal timber and the prime forest covers almost 1.5 million hectares of the State Forests. Karri (*E. diversicolor*) is next in importance and is distributed over some 140,000 hectares. Wandoo (*E. wandoo*) accounts for a smaller portion of the dedicated area and Tuart (*E. gomphocephala*), another valuable timber, has a restricted area of about 3,000 hectares. Blackbutt (*E. patens*) occurs in patches throughout the jarrah and karri forests and is an important milling timber with properties and uses similar to jarrah. Marri (*E. calophylla*), the most widespread of the commercial eucalypts, has been used to a limited extent, for building scantling and as a pole timber. Of greatest importance, however, is the use of marri as principal material for an export wood chip industry based on the Manjimup region.

Other eucalypts and many trees of different genera occur within the prime forest belt but they are not of major economic importance. The main distribution of the prime forests, which are practically confined to the south-western portion of the State, is shown on the accompanying map.





### The Inland Forests

Beyond the area of prime forest is an inland sclerophyllous woodland, within which are a number of eucalypts (both tree and mallee form), as well as several types of *Acacia*, such as the wattles and mulgas, tea tree (*Melaleuca spp.*) and casuarinas. Sandalwood (*Santalum spicatum*), indigenous to the wheat belt and semi-arid areas of the State, is still exported to Asian countries but is now obtained only from the semi-arid regions.

While none of the inland woodland can be classed as suitable for sawmilling in the ordinary sense, it forms an important source of timber for mining and agricultural purposes. During recent years, soil conservation in the regions of low rainfall has received increasing attention and the importance of controlling clearing, grazing and firewood cutting has been recognised. The Forests Department maintains a staff to exercise these controls and to advise on tree planting. Work is proceeding with demarcation of areas representing important inland ecotypes for which long-term conservation proposals have been prepared.

### Forestry Administration

Scientific forestry was given considerable impetus in Western Australia with the passing of the Forests Act in 1918. Extensive cutting over the previous fifty years had seriously depleted the State's forests and adequate provision had not been made for protection and regeneration. The Act, with significant amendments in 1974 and 1976 confers wide powers on the Forests Department to provide for multiple use management of the forest resource.

The forests are managed within a long range working plan which caters for wood production, water yield, recreation, flora and fauna conservation, amenity and minor product values. Specific areas are accorded a usage priority depending on the natural site potential and the State demand. Trees approved for cutting are marked by trained foresters, who work under the direction of the Conservator of Forests and closely control both the indigenous forest and State pine plantations. The future productivity of the forests is also safeguarded by ensuring that cutting is carried out to protect immature growth and other forest values and to encourage regeneration.

All forest operations are planned to reduce the influence of forest disease. In particular, the introduced jarrah dieback disease (*Phytophthora cinnamomi*) necessitates careful planning and control and special hygiene and quarantine measures are employed.

In future years, if the demand from the increasing population is to be met, it will be necessary to supplement the timber supplies from the natural hardwood forest. For this purpose plantations of exotic pines, principally *Pinus radiata* and *Pinus pinaster*, have been established throughout the south-west.

Only approximately 5,500 hectares of pine were planted in the period from just prior to 1920 up to 1950. These areas were almost entirely experimental and were used to solve the many nutritional and technological problems which were encountered.

Plantings at a higher rate have been undertaken since 1955, bringing the present total State-owned pine plantation area in Western Australia to 48,172 hectares.

Recent plantings have been at approximately 2,700 hectares per annum, but this will have to be lifted to approximately 3,000 hectares per annum if the desired self-sufficiency is to be attained by just after the turn of the century.

Much of the land used for pine planting at present is repurchased farmland and although it is intended to continue with the repurchasing policy it will not be possible to obtain sufficient area in this way. Because of this, parts of a large area, south of Busselton, known as the Donnybrook Sunkland are being planted. At the same time plans are also being devised to enhance the conservation and amenity values of the area.

Plantings in the Sunkland, together with those of the Blackwood Valley and others relatively close to Bunbury, will provide the raw material for future, large, integrated pine-utilisation industries such as sawmills, particle board, veneer and plywood plants, and pulp and paper mills.

Because of the hot, dry summers experienced in most of the areas covered by State Forests, there is a considerable risk of damage by fire and intensive precautions are taken by the Department to minimise this danger. Radio-equipped spotter aircraft and key look-out towers provide surveillance of the critical forest areas during prescribed burning periods and during summer. An area of 336,102 hectares was burnt by prescription in 1980 and 85 per cent of this burning was carried out by dropping incendiaries from a low-flying aircraft. Restrictions are placed on all burning operations by farmers and other persons when the fire hazard is high and at such times warnings are issued emphasising the danger. All staff and employees of the Department are available and trained to fill roles in either direct fire fighting or technical support. Fire suppression is planned on the basis of rapid attack with adequate crews for achieving early control.

In association with the system of cutting control, various royalties, licence and permit fees are collected as part of the Consolidated Revenue of the State.

### Principal Forest Products

Sawn timber from jarrah and karri is the principal form of forest wood production, but there will be a gradual increase in the use of pine in the future. Karri and locally grown pine logs together with imported logs are used for plywood. During recent years, there has been a greater use of local logs for plywood manufacture. Small sized logs from thinning pine plantations and manufacturing residues are used for the production of particleboard. Hardwood mill wastes and bush residues of marri and karri now form the basis of an important export woodchip industry located in the southern forests.

In addition to these major wood products, the State's forest wealth includes sandalwood for export, firewood for general purposes, and various seeds and plants for propagation both in Australia and abroad. The karri, wandoo, marri and some inland shrub species are important nectar producers for apiarists, who move their bees to various forest sites in following the nectar flow.

The following table gives details of log production and sawn timber production from 1974-75 to 1979-80.

TIMBER PRODUCTION  
(Cubic metres)

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Sawlog production (a) —						
Hardwood	1,048,925	1,102,491	1,038,126	1,003,569	963,147	935,416
Softwood	79,231	45,083	45,352	53,788	57,388	60,030
Other log production (b) —						
Hardwood	6,239	98,370	377,021	434,377	472,961	615,488
Softwood	49,918	60,484	75,842	73,437	125,683	136,160
Sawn timber production —						
Hardwood	368,844	383,010	369,151	347,111	331,135	331,411
Softwood	27,086	16,258	16,685	18,669	18,145	21,400

(a) Includes sawlogs and logs used in the production of plywood veneer.

(b) Includes chipwood.

With increased development and competition for resources the value of State Forests for water production and recreation is becoming increasingly apparent. The current working plan emphasises water production as the major production objective in the northern jarrah forest. Provision to meet the forest recreation needs of the public is also afforded high priority.

Sawmilling and production of timber is also referred to under *Manufacturing* in Part 3 of this Chapter.

In 1979-80 exports of railway sleepers totalled 34,061 cubic metres, of which 1,988 went to other Australian States and 32,073 to overseas markets, mainly the United Kingdom and Belgium-Luxembourg. In the same year 30,309 cubic metres of other rough, sawn or dressed timber were exported to other Australian States, and 7,585 shipped overseas, the principal markets being Belgium-Luxembourg and New Zealand.

## FISHERIES (INCLUDING WHALING AND PEARLING)

## General Fisheries

Since the end of the second World War, rock lobsters have become the most important item of production of the fishing industry. Prior to the war there was a small local market for fresh rock lobsters, but in 1941 production was stimulated by canning for the armed forces. Although canning continued until 1950, it had become far less important by 1947 than another development, the freezing of rock lobster tails for export, mainly to the United States of America. The overseas demand, which developed rapidly in post-war years, gave great impetus to the industry and the take increased greatly after 1947 to a record production of 11,461 tonnes in 1978-79 valued at \$56.8 million. The highest value of catch ever recorded is \$62.1 million in 1979-80. Overseas and interstate exports of rock lobster tails in 1979-80 totalled 3,603 tonnes with a f.o.b. value of \$50.3 million, while the figures for 1978-79 were 4,170 tonnes and \$51.1 million, respectively.

The following table shows the catch and value of fish, crustaceans and molluscs by principal species for Western Australia for the years 1977-78 to 1979-80.

## FISH, CRUSTACEANS AND MOLLUSCS: CATCH AND VALUE

Species — Common name	Quantity (a) (tonnes)			Value (b) (\$'000)		
	1977-78	1978-79	1979-80	1977-78	1978-79	1979-80
<b>Fish —</b>						
Cobbler	273	176	254	255.8	306.3	362.5
Emperor (North-west snapper)	101	73	91	117.8	73.3	125.5
Herring, Australian	811	913	776	275.7	252.7	271.7
Herring, Perth	311	277	144	142.9	116.3	62.0
Jewfish, Westralian	130	186	184	359.5	513.3	547.1
Mackerel, Spanish	99	126	123	72.7	158.7	176.5
Mullet, sea	565	563	693	316.3	326.4	402.1
Mullet, yellow-eye	449	594	404	255.5	302.3	234.3
Perch, giant (Barramundi)	37	35	25	128.3	64.4	46.0
Pilchard	1,105	890	826	597.0	444.9	413.1
Salmon, Australian	750	1,133	1,221	269.1	434.8	581.2
Scaly mackerel	524	520	746	188.8	207.8	469.9
Shark, bronze whaler	137	188	299	129.9	168.4	288.9
Shark, whiskery	201	183	358	151.2	138.2	275.3
Shark, other	566	410	506	230.6	261.7	321.5
Snapper	511	491	699	477.8	483.2	811.5
Tuna, southern bluefin	1,924	1,742	2,496	866.6	794.8	2,109.3
Whiting, King George	52	38	36	120.2	93.4	119.4
Whiting, western sand	160	227	224	186.6	294.6	309.8
Other species	2,191	775	810	1,582.7	649.6	762.1
<b>Total, Fish</b>	<b>10,897</b>	<b>9,540</b>	<b>10,915</b>	<b>6,725.0</b>	<b>6,085.1</b>	<b>8,689.7</b>
<b>Crustaceans —</b>						
Crabs	127	102	101	134.3	140.4	167.3
<b>Prawns —</b>						
Banana	87	17	165	133.5	45.0	526.7
Brown tiger	1,585	1,366	1,044	8,321.9	8,143.8	5,480.0
Endeavour	385	365	291	1,123.6	1,283.1	884.4
Western king	1,797	1,620	1,758	7,307.1	6,267.9	6,131.4
Other species	86	104	129	169.7	260.2	388.4
<b>Total, Prawns</b>	<b>3,940</b>	<b>3,471</b>	<b>3,387</b>	<b>17,055.9</b>	<b>16,000.0</b>	<b>13,410.9</b>
<b>Rock lobsters —</b>	<b>10,773</b>	<b>11,461</b>	<b>10,738</b>	<b>50,880.3</b>	<b>56,819.7</b>	<b>62,082.6</b>
<b>Total, Crustaceans</b>	<b>14,839</b>	<b>15,034</b>	<b>14,226</b>	<b>68,070.5</b>	<b>72,960.0</b>	<b>75,660.8</b>
<b>Molluscs —</b>						
Abalone	248	305	311	626.1	965.2	1,050.8
Scallops	876	396	260	235.4	111.6	81.8
Other molluscs	297	230	267	244.6	111.4	169.3
<b>Total, Molluscs</b>	<b>1,421</b>	<b>932</b>	<b>838</b>	<b>1,106.2</b>	<b>1,188.1</b>	<b>1,301.9</b>
<b>TOTAL, WESTERN AUSTRALIA</b>	<b>27,158</b>	<b>25,505</b>	<b>25,979</b>	<b>75,901.6</b>	<b>80,233.3</b>	<b>85,652.4</b>

(a) Live (whole) weight.

(b) Gross value paid to fishermen.

The most important commercial species of rock lobsters in Western Australian waters is the western rock lobster (*Panulirus cygnus*), which is fished off the south-west coast between Murchison River and Bunbury. The principal localities around which rock lobsters are caught are Houtman Abrolhos, Geraldton, Dongara, Beagle Island, Green Head, Jurien Bay, Cervantes, Lancelin, Ledge Point and Fremantle. The industry is protected from overfishing by such measures as the declaration of closed seasons; the proclamation of fishing zones; the prohibition of the taking of lobsters of less than a prescribed size or of female rock lobsters having berry (i.e. eggs) attached; requiring that every rock lobster pot shall have an escape gap of specified dimensions; limiting licences for boats for rock lobster-fishing; and limiting the number of pots that a boat may carry or use at any one time. The catch is processed either on specially equipped freezer boats or at shore stations licensed under the *Fisheries Act 1905-1979* as processing establishments.

The catches of Australian salmon (*Arripis trutta*), which school in the bays on the south and lower south-western coasts, yield a large proportion of the production of inshore and beach fishing and are used almost exclusively for canning. The remainder of the catch from this type of fishing comprises chiefly tailor (*Pomatomus saltatrix*), Australian herring (*Arripis georgianus*), western sand whiting (*Sillago schomburgki*), sea mullet (*Mugil cephalus*) and trevally or skipjack (*Caranx georgianus*). This is sold mainly as wet fish on the local market, but large quantities of Australian herring are canned and there are some exports, principally of whiting, to other Australian States. There is an important fishery for southern bluefin tuna (*Thunnus maccoyii*) on the south coast of the State and investigations are being conducted on the commercial potential of tuna stocks in northern waters.

The coastal waters northward from the mouth of the Murchison River to North West Cape and Exmouth Gulf are the source of several species of commercial importance. Snapper (*Chrysophrys unicolor*) are caught between the Murchison River and North West Cape during the northern schooling season from May to August. Cod and Spanish mackerel, though in smaller quantities, are also caught between the Murchison River and North West Cape. At Shark Bay a prawn-fishing industry has been successfully established, the catch being processed at Carnarvon. The species caught are the western king prawn (*Peraeus latisulcatus*) and the brown tiger prawn (*P. esculentus*). A prawn fishery has also been established at Exmouth Gulf, the principal species caught being the brown tiger prawn and the western king prawn. Quantities of endeavour prawn (*Metapenaeus endeavouri*) and banana prawn (*P. merguensis*) are also caught. The catch is processed at Learmonth and on freezer boats. As a conservation measure the number of fishing boats licensed to operate has been limited to thirty-five at Shark Bay and twenty-three at Exmouth Gulf. From a catch of 108 tonnes in 1961-62, the State production of prawns increased significantly and in 1977-78 reached 3,940 tonnes. A small fishery, limited to seventeen prawn trawlers, fishes from Nickol Bay. Banana and brown tiger prawns are also caught seasonally at Onslow and Shark Bay.

The first fishing grounds to be exploited were the estuaries and rivers and, although they are not now as important as other grounds, they still provide substantial quantities of fish of a fairly wide variety. The principal species are cobbler (*Cnidoglanis macrocephalus*) and yellow-eye mullet (*Aldrichetta forsteri*), sea mullet and Perth herring (*Nematalosa vlaminghi*) most of which are caught in the Swan and Harvey Estuaries and the Peel and Leschenault Inlets. Other species taken include sand whiting, King George whiting (*Sillaginodes punctatus*), tailor, garfish (*Hyporhamphus spp.*) and pilchard (*Sardinops neopilchardus*). Crabs (*Portunus pelagicus*), school prawns (*Metapenaeus dalli*) and western king prawns are also caught commercially in these waters.

A summary of the principal statistics of the fishing industry is given in the following tables.

### GENERAL FISHERIES

At 31 December —	Boats licensed	Value of boats and equipment	Fishermen licensed (a)	Year	Production			
					Rock lobsters		Other fish (b)	
					Quantity (c)	Value	Quantity (c)	Value
	number	\$'000	number		tonnes	\$'000	tonnes	\$'000
1975	1,588	37,672	3,241	1974-75	8,306	19,929	7,222	2,549
1976	1,569	39,298	3,055	1975-76	8,757	29,493	7,778	3,633
1977	1,678	53,239	3,616	1976-77	9,297	44,141	7,559	4,291
1978	1,798	77,198	3,863	1977-78	10,773	50,880	10,897	6,725
1979	1,956	110,471	4,305	1978-79	11,461	56,820	9,540	6,085
1980	n.a.	n.a.	n.a.	1979-80	10,738	62,083	10,915	8,690

(a) Comprises employees and working proprietors.

(b) Excludes crustaceans and edible molluscs.

(c) Live (whole) weight.

### FISH, CRUSTACEANS AND MOLLUSCS — CATCH BY METHOD: 1979-80 (Tonnes)

Particulars	Haul net and beach seining	Mesh set and gill netting	Hand lining	Trawling	Pot fishing and drop nets	Other methods	Total
Fish	3,085	2,073	1,121	11	407	4,218	10,915
Crabs	7	78	—	1	14	1	101
Prawns	—	7	—	3,367	—	13	3,387
Rock lobsters	—	—	—	1	10,726	11	10,738
Molluscs	2	—	1	274	13	548	838
Total	3,094	2,158	1,122	3,654	11,160	4,791	25,979

Over recent years, research work on the biology of the marron (*Cherax tenuimanus*), conducted by the Department of Fisheries and Wildlife, has examined the feasibility of marron aquaculture in the south-west. In December 1976, regulations were passed under the Fisheries Act, establishing fish-farming guidelines. Limited commercial production of marron for sale became available during 1977. Juvenile marron for stocking farm dams or establishing brood stocks for commercial culture are available from licensed marron farms.

Brown trout, rainbow trout and English perch have been introduced into the streams of the south-west. These species together with indigenous stocks of freshwater cobbler, marron, barramundi and cherabin, provided fishing sport for 13,937 licensed amateur inland fishermen during 1979-80.

The Western Australian Department of Fisheries and Wildlife, in association with the Commonwealth Scientific and Industrial Research Organization and other State and Commonwealth authorities, is undertaking research on rock lobsters, prawns, whiting, scallops, abalone, tuna and Australian salmon in Western Australian marine waters. These organisations are also involved in research into problems relating to estuaries and freshwaters, including examination of the effects of dredging and damming, the introduction of trout and marron into dams and freshwater streams, the pollution of inland lakes, and the tourist and recreational potential of the estuaries and freshwaters of the State.

Research is carried out chiefly at two centres. The marine research centre at Waterman, about twenty-two kilometres north of Fremantle was built for the Department of Fisheries and Wildlife and incorporates several separate laboratories and a large aquarium with circulating water, for experiments and studies on a wide range of species. A second centre, the Commonwealth Scientific and Industrial Research Organization marine research centre at Marmion was opened in 1976.

A special group of Fisheries Department officers is investigating the potential for commercial exploitation of selected species of fish and areas which, to date, have not been commercially exploited.

## Whaling

Whaling was conducted along the Western Australian coast from the first years of settlement and whale oil and whale bone were among the earliest exports from the Colony. Activity since then has fluctuated widely and has now ceased altogether. At a meeting held in London in July 1963 the International Whaling Commission imposed a total ban on the taking of humpback whales for an indefinite period in all waters of the Southern Hemisphere. The company operating from Carnarvon, which relied mainly on the taking of humpbacks, ceased whaling activities at its Carnarvon base in August 1963.

From 1963 onwards, the only station operating was at Cheynes Beach, Frenchman Bay, where sperm whaling had been carried on since 1955. The station finally closed in November 1978.

The figures in the following table have been derived from information provided by the Fisheries Branch of the Australian Department of Primary Industry. Since 1963, more whales were taken in 1975 than in any other year but the highest annual production of oil (6,166 tonnes) occurred in 1971.

WHALING

Particulars		1974	1975	1976	1977	1978
Sperm whales taken	No.	1,082	1,174	995	624	679
Oil produced (a)	tonnes	5,554	5,768	5,694	3,872	3,478

(a) 1 tonne = 6 barrels (approximately)

## Pearl-shell Fishing and Pearl Culture

Pearl and pearl-shell fishing has been a valuable industry for many years, the main centre being Broome. The pearls obtained were once an important feature of production but the success of the industry now depends almost entirely on the shell produced and the price obtainable for it. Activities were suspended following the outbreak of war with Japan, when valuable luggers and equipment were lost. After the war recovery of the industry was slow because of a shortage of suitable boats and the difficulty in obtaining experienced divers. In 1953 the rate of progress improved when the services of trained Japanese divers again became available. By 1957 production of the shell had reached the pre-war level of about 1,000 tonnes but because of the depressed state of the market it fell to 765 tonnes in 1958. Except for a slight recovery in 1960, production declined in each year from 1959 until 1964, when 140 tonnes of shell were raised. As a result of the increased demand for shell for pearl culture, production has increased slightly since then.

In 1956 a licence was granted to a company to culture pearls at Kuri Bay in Brecknock Harbour, 209 kilometres north-east of Derby and the initial harvest of pearls was gathered in 1957. Licences have since been issued to other companies and pearl culture farms are now successfully established in Cygnet Bay, Roebuck Bay, Kuri Bay and at Port Smith, south of Broome.

## Australian Fishing Zone

The Australian Fishing Zone (A.F.Z.) covering waters within 200 nautical miles of Australia was declared on 1 November 1979. Under licence from the Commonwealth Government, foreign fishing vessels are permitted to fish within the Zone. A number of joint-venture feasibility studies and test fishing programmes have been conducted in the Zone during 1980. The Fishing and Allied Industries Committee, with the assistance of a grant from the Reserve Bank of Australia's Rural Development Credit Fund has studied the potential production available from the A.F.Z. off Western Australia.

## HUNTING

Although hunting has been carried on from the first years of settlement, it has never been an important industry. In 1979-80 the recorded gross value was \$3.7 million but reliable and complete information is difficult to obtain and this amount could therefore be deficient.

Kangaroos have been destroyed in great numbers from the earliest days, the principal reason for the organised destruction being the damage done to pastures and fencing. In 1971 the kangaroo management programme under the control of the Western Australian Department of Fisheries and Wildlife came into effect. This programme, based on a reserve/sanctuary system, limited shooting seasons and licensing of kangaroo shooters is designed to ensure the long-term conservation of the kangaroo while recognising the right of the landholder to protect his property.

The earliest recorded export of rabbit skins relates to the year 1900 and the meat and skins of these animals have been a source of income to trappers ever since. In an attempt to reduce the damage done to crops and pastures, various methods of control have been adopted and since the second World War an intensive campaign, using myxomatosis virus, poisons and warren ripping, has met with considerable success. As a result, the quantity of rabbit meat produced and the number of skins exported and treated locally have declined greatly and are now insignificant.

Feral goats are slaughtered and the meat is exported.

The skins of animals other than marsupials and rabbits, together with exports of Western Australian fauna, are taken into account in the value of the hunting industry, but these are not significant.

## *Chapter VIII—continued*

### **Part 2 — Mining**

#### **DESCRIPTION OF MINING IN WESTERN AUSTRALIA**

Although the discovery of gold was of particular significance in the early development of the Western Australian economy, renewed importance of the mining industry in the State began mainly with the considerable expansion associated with iron ore and other minerals which occurred in the late 1960s. This recent growth in importance of the industry is demonstrated by the fact that in 1979-80, value added (see definition at the beginning of this Chapter) by mining establishments in Western Australia was \$1,165 million, or 510 per cent more than in 1968-69 when value added data first became available. Value added by mining establishments in Western Australia in 1979-80 was \$929 per head of mean population, compared with the national average of \$386.

The map which follows shows the location of the major operating mining projects in Western Australia at the end of December 1980. The text below describes the development of the mining industry in the State including references to current projects depicted on the map.

The first major developments followed the discovery of *gold* in the Kimberley region of the far north of the State in 1885, although gold had been found in various places previously and other minerals had also been discovered, including copper and lead in the Northampton district, north of Geraldton, and coal at the Irwin River, south of the same town. The Kimberley gold find was followed by extensive prospecting activity resulting in gold strikes between 1887 and 1891 in the Yilgarn, Pilbara, Ashburton and Murchison districts. Rich discoveries in 1892 at Coolgardie and in 1893 at nearby Kalgoorlie were followed by development of the famous 'Golden Mile' between Kalgoorlie and Boulder which became one of the major gold producing areas of the world and, until recently, was the principal source of gold both in the State and in Australia.

Although gold production declined after the exhaustion of surface deposits and the peak production of 64,222,000 grams in 1903, gold mining remained as the major component of the Western Australian mining industry for many years. Since 1903, production of gold has fluctuated markedly. Gold mining has decreased considerably on the 'Golden Mile', and at the end of 1980 only one major gold mine was operating in that area. However, the commencement in 1977 of operations at the Telfer Mine in the Paterson Ranges (currently the largest goldmine in Australia) reversed the generally downward trend in gold production which had existed since 1960. The State's gold production of 6,305,000 grams in 1975-76 was the lowest recorded since 1894; however, the 1979-80 production of 11,598,000 grams was 84 per cent higher than the 1975-76 figure.

Increases in the price of gold during the latter part of the 1970s, and particularly in the last half of 1979, resulted in increased exploration for new gold deposits, as well as the reassessment of old gold mines which had previously been closed. From the low level of \$83 per fine ounce in August 1976, the Australian gold price rose steadily to reach the high figures of \$132, \$150 and \$207 in 1976, 1977 and 1978 respectively. After further steady increases in the first half of 1979, the price accelerated rapidly, reaching \$467 in December 1979 and \$752 in January 1980. During the remainder of 1980, the price fluctuated considerably, but remained within the range \$500 - \$600 per fine ounce for most of the year.



By early 1981, several new mines (including previously abandoned ones, which had been redeveloped) had commenced production of gold, while a number of other projects were still in the evaluation or developmental phase. In addition, the increases in the gold price, combined with improved metallurgical technology, has enabled the profitable retreatment of tailings and residues from earlier gold mining operations.

In the mid-1960s the importance of gold in Western Australia (in terms of value of production) was surpassed by the production of iron ore from the major deposits in the north-west of the State; and by the mid-1970s the value of gold had also fallen behind nickel, petroleum, bauxite and mineral sands. However, subsequent increases in both production and prices resulted in the value of production of gold in 1979-80 being exceeded only by that for iron ore and nickel.

*Iron ore* in the form of hematite has been mined at Cockatoo Island, in Yampi Sound in the north of the State, since 1951 and limonitic ore was mined at Wundowie in the Darling Range east of Perth for some years from 1948. It was not until the early 1960s, however, following the Australian Government's decision to modify its embargo on overseas exports of iron ore, which had been in force since 1938, that widespread interest in developing the State's iron ore resources occurred. The ensuing activity has resulted in iron ore becoming the major Western Australian mineral with production (including pellets) of 91,519,000 tonnes containing 57,896,000 tonnes of iron, valued at \$993 million in 1979-80. This represents a 16 per cent increase over the previous year's production and is the highest production to date.

The State's measured, indicated and inferred iron ore reserves with an iron content of more than 55 per cent were assessed by the State Department of Mines as 33,000 million tonnes at May 1978. The deposits occur mainly in the Pilbara, in the north-west of the State, where major production commenced in 1966 and expanded each year up to 1975-76, when a fall in production was recorded. Since then, production has fluctuated, but had generally tended to decrease, until 1979-80, when a significant increase was recorded. All of the production from this area is exported, mainly to Japan. Ore from Mount Goldsworthy and Shay Gap, east of Port Hedland, is railed to a deepwater port at Finucane Island, just off Port Hedland. Output from Mount Tom Price and Paraburdoo, in the Hamersley Range area south-west of Port Hedland, is railed to Dampier for shipping through loading facilities at Parker Point and East Intercourse Island. From Mount Whaleback in the Ophthalmia Range near Newman, ore is railed to Port Hedland and limonitic ore from Pannawonica in the Robe River valley is railed to Cape Lambert where it is shipped as fines.

Iron ore is also mined at Koolyanobbing, some 450 kilometres east of Perth, where production commenced in 1950. This ore is used mainly for pig-iron production at Kwinana; production of pig-iron at Wundowie, which also utilised Koolyanobbing ore, ceased in early 1981. The first shipment of ore from the deposits on Koolan Island, adjacent to Cockatoo Island in Yampi Sound, was made in January 1965.

At the end of 1980, a number of new mines were in the planning stage, as were expansion programmes for some of the existing mines. In addition, concentrating plants had been constructed at Mount Whaleback and Tom Price, to treat low grade ores which are currently unsaleable. However, iron ore pelletising plants located at Dampier and Cape Lambert closed during 1980, largely because of cost increases caused by the continued escalation in crude oil prices.

*Nickel* was discovered in 1966 at Kambalda to the south of Kalgoorlie and there followed a period of rapid expansion in the nickel industry accompanied by a very high level of exploration activity. At the end of 1980 mines were operating at Kambalda and Nepean, south of Kalgoorlie, and at Agnew, some 350 kilometres north of Kalgoorlie. Weakness in the world market for nickel led to some reduction in production during 1978-79, which continued into 1979-80. Nickel concentrates are exported from Esperance or processed in a smelter at

Hampton, near Kalgoorlie, and a refinery at Kwinana for subsequent export in processed form. In 1979-80 production of concentrates was 347,039 tonnes, containing 43,182 tonnes of nickel.

In May 1966 Barrow Island, about 100 kilometres north-east of Onslow, was declared a commercial oilfield. The first shipment of *crude oil* from this field was made on 25 April 1967. Production in 1979-80 (including a small amount produced at Dongara) was 1,504,000 cubic metres valued at \$106.6 million. In July 1970 a *natural gas* field at Dongara, about 100 kilometres south-east of Geraldton, was declared commercially viable and subsequently a 410-kilometre underground pipeline was constructed to supply gas to domestic and industrial users in Perth and heavy industry in Kwinana and Pinjarra. This supply commenced on 1 December 1971. Production of natural gas in 1979-80 (including a small amount produced at Barrow Island) was 862 million cubic metres. Developmental activities for the exploitation of the North West Shelf natural gas deposits, about 130 kilometres off-shore from Dampier, commenced late in 1980. Initially, natural gas will be supplied to industrial users in the Pilbara, and transported by pipeline to Perth and some industrial users to the south of Perth. The second stage of the project involves the overseas export of *liquefied natural gas* in specially constructed tankers. Significant amounts of *condensate* and *liquefied petroleum gas* will also be produced. When the formal 'go-ahead' for the project was announced on 30 September 1980, the capital cost of the project (in terms of January 1980 prices) was estimated at about \$5,000 million. Initial sales of gas are expected to be made in 1984.

*Bauxite* deposits at Jarrahdale in the Darling Range near Perth were first mined in 1959, and in 1963 the mine began supplying ore to an alumina refinery at Kwinana. Mining commenced further south in the Darling Range in 1972 to supply a new refinery near Pinjarra which began operations in April 1972. Bauxite production from both areas amounted to 13,309,000 tonnes in 1979-80. Bauxite/alumina projects are currently under construction at Wagerup and Worsley, in the southern region of the Darling Range.

Ilmenite, leucoxene, rutile, zircon, monazite and xenotime concentrates are being produced from *mineral sands* mined near Capel and treated there and nearby at Bunbury. The ilmenite content is of particular importance because it is virtually chrome-free and little difficulty is experienced in producing a concentrate of high quality. Production of ilmenite concentrates commenced in 1956, when recorded production was 3,346 tonnes. Since 1974, various operators have commenced mining and treatment of mineral sands in the Eneabba-Jurien Bay area north of Perth. However, operations at Jurien Bay ceased during 1977. Some treatment is also carried out at Geraldton. Rutile and zircon are the major products from the Eneabba area, whereas in the Capel area, ilmenite accounts for most of the value of mineral sands production. In 1979-80, ilmenite production was 1,284,863 tonnes, valued at \$26.7 million. Production of rutile was 106,047 tonnes valued at \$24.1 million, zircon 263,367 tonnes valued at \$14.3 million, while the total value of mineral sands produced was \$73.2 million.

The only commercial production of *coal* in Western Australia occurs at Collie in the south-west of the State. The coal is sub-bituminous and identified resources in the area were estimated in 1978 at 1,915 million tonnes. Underground mining commenced in the 1890s and surface mining was introduced in 1943. In 1979-80 production from surface and underground mines totalled 3,039,000 tonnes valued at \$54.5 million. Large increases in the price of imported petroleum have resulted in a growth in the demand for coal and coal output has increased considerably since 1974, after having been fairly stable at around one million tonnes per annum for a number of years. During the same period, the value of coal per tonne has also increased significantly.

In 1968 large-scale production of *common salt* (sodium chloride) commenced at Lake Lefroy near Kambalda and subsequently production of salt by the solar evaporation of sea water began

at Port Hedland, Lake MacLeod near Carnarvon, Useless Loop in Shark Bay and at Dampier. Most of the salt produced is exported. Production in 1979-80 was 4,248,000 tonnes valued at \$32.2 million. *Gypsum* is also extracted in certain areas associated with salt production.

Among other minerals produced in Western Australia are *tin* and *tantalite-columbite* which were discovered at Greenbushes, in the south-west, in 1888. Deposits of these minerals are also mined in the Pilbara region, in the north-west of the State. Production of 599 tonnes of tin concentrate valued at \$6.79 million was recorded in 1979-80, while output of tantalite-columbite concentrate was 166,000 kilograms, valued at \$12.34 million. *Talc* is produced from deposits at Three Springs, south-east of Geraldton, and at Mount Seabrook near the upper Murchison River. Production in 1979-80 totalled 160,767 tonnes. *Copper*, *lead* and *manganese* have been mined in significant quantities in the past but activity has declined in recent years, although significant amounts of copper, together with cobalt and precious metals, are contained in nickel concentrates produced. *Silver* in Western Australia is produced only as a by-product of processing other minerals, mainly gold.

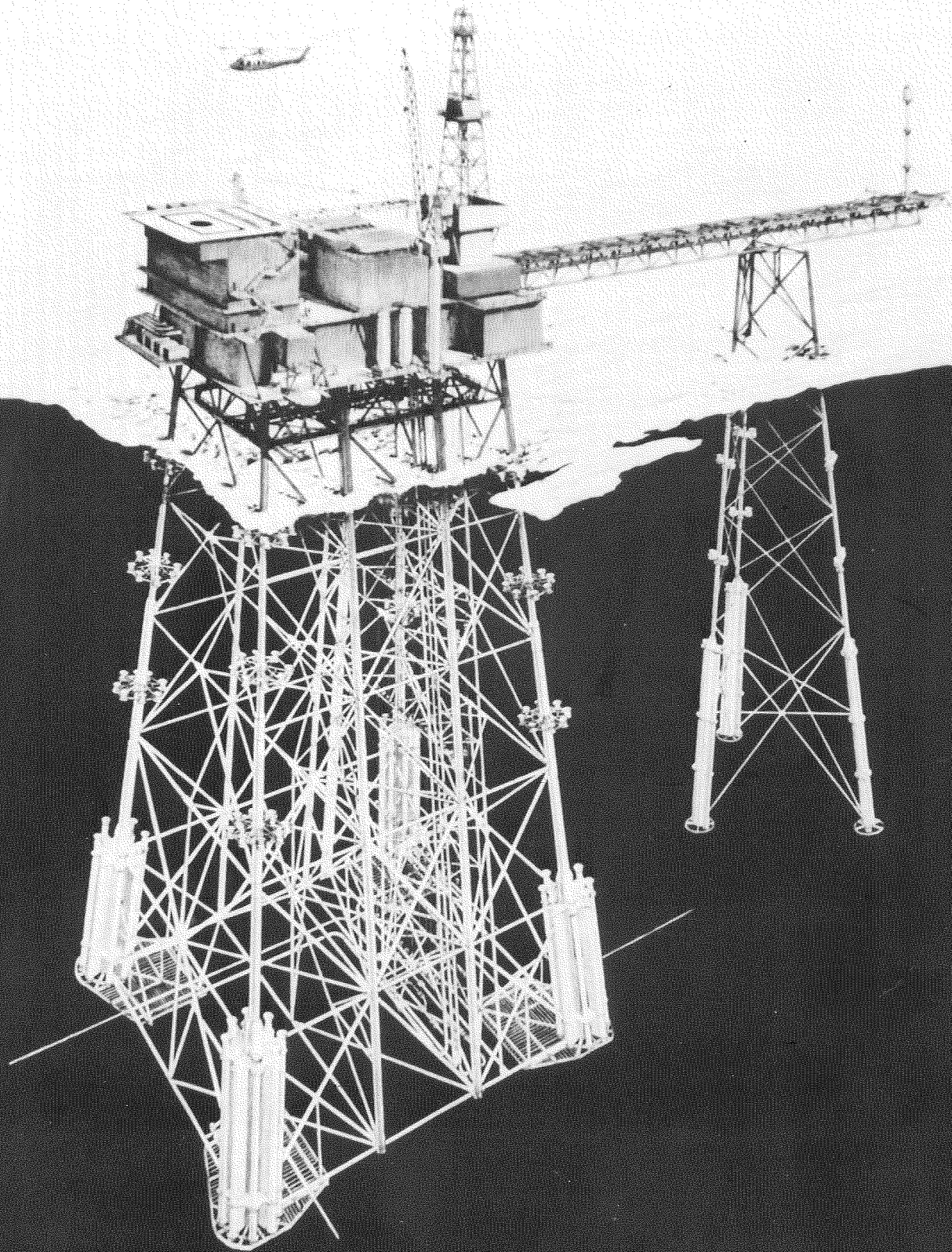
The quarrying of *construction materials* in Western Australia is an important part of the mining industry. However, materials such as sand and gravel, which are in very plentiful supply, are not included in mining statistics because of difficulties in compiling reliable data. In 1979-80 the value of recorded production of building and monumental stone (mainly limestone, granite and sandstone), crushed and broken stone (used mainly for roads, concrete and rail ballast) and crushed and broken limestone, was \$28.7 million. A further 1,248,000 tonnes of *limestone* valued at \$4.89 million was produced for other purposes, including agriculture, cement making, glass making, lime burning and iron ore pelletising.

Apart from the minerals mentioned above, a number of deposits of other minerals are expected to be in production in Western Australia in the near future. At Teutonic Bore, 250 kilometres north of Kalgoorlie, the development of a *zinc/copper* mine commenced during 1980 and production commenced in mid-1981. A further 150 kilometres north-west, at Yeelirrie, a deposit of *uranium* ore has been discovered. Since late 1980 a metallurgical research plant has been in operation at Kalgoorlie to investigate the treatment requirements of the ore. *Diamonds* have been discovered at various locations in the Kimberley region in the far north of the State and a number of pilot treatment plants are in operation to enable detailed evaluations of the deposits to be made. Initial testing indicates that some individual occurrences may be very rich by world standards. Mining of a *vanadium* deposit at Coates, some seventy kilometres east of Perth, commenced in early 1981. The ore is being processed nearby at Wundowie, at facilities installed adjacent to the recently closed pig-iron works.

### MINING STATISTICS

In the Australian Standard Industrial Classification, 'mining' is used in the broad sense to include the extraction of minerals occurring naturally as solids such as coal and ores, liquids such as crude petroleum, or gases such as natural gas, by such processes as underground mining, open-cut extraction, quarrying, operating of wells or evaporation pans, dredging or recovering from ore dumps or tailings. Establishments engaged mainly in dressing or beneficiating ores or other minerals by crushing, milling, screening, washing, flotation, other (including chemical) beneficiation processes and natural gas absorption and purifying are included. Excluded are establishments engaged mainly in the refining or smelting of ores (other than the preliminary smelting of gold) and in the manufacture of such products of mineral origin as coke, cement or fertilisers.

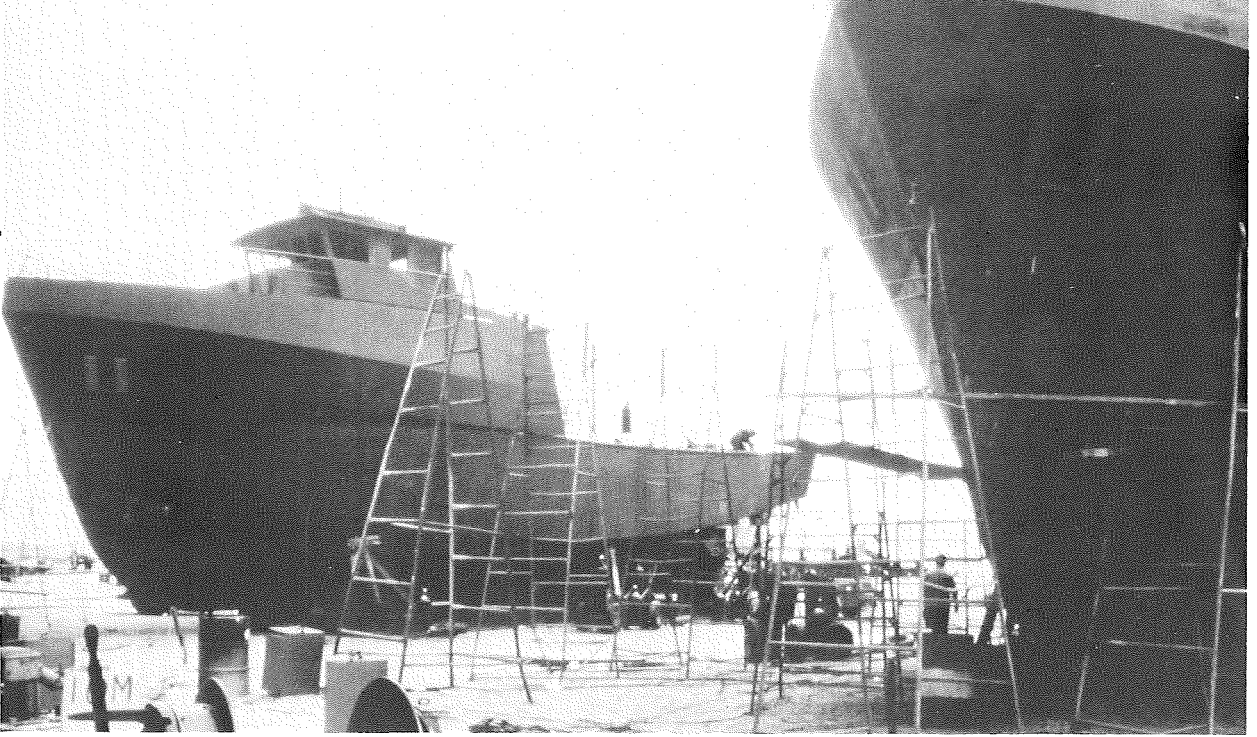
Mining statistics presented in the following tables are derived from the integrated economic censuses of mining described in the introduction to this Chapter. Definitions of the items in these tables are also given in the introduction. It should be noted that the tables relate only to



*Woodside Offshore Petroleum Pty Ltd*

PLATE 8 — An isometric diagram of the North Rankin 'A' production platform that will be used in the North West Shelf Natural Gas Project.



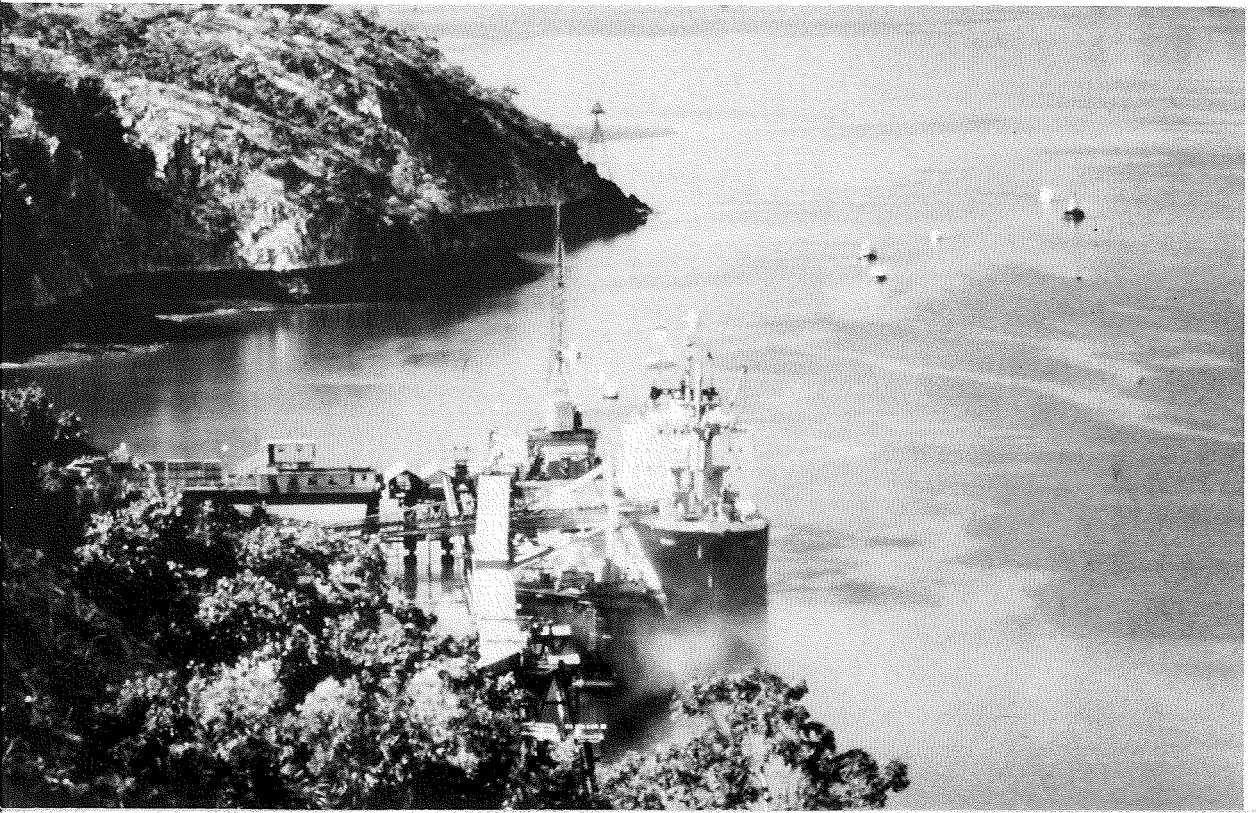


*Department of Industrial, Commercial and Regional Development*

PLATE 9 — SHIPBUILDING, FREMANTLE

PLATE 10 — STATESHIP BOOGALA AT KOOLAN ISLAND

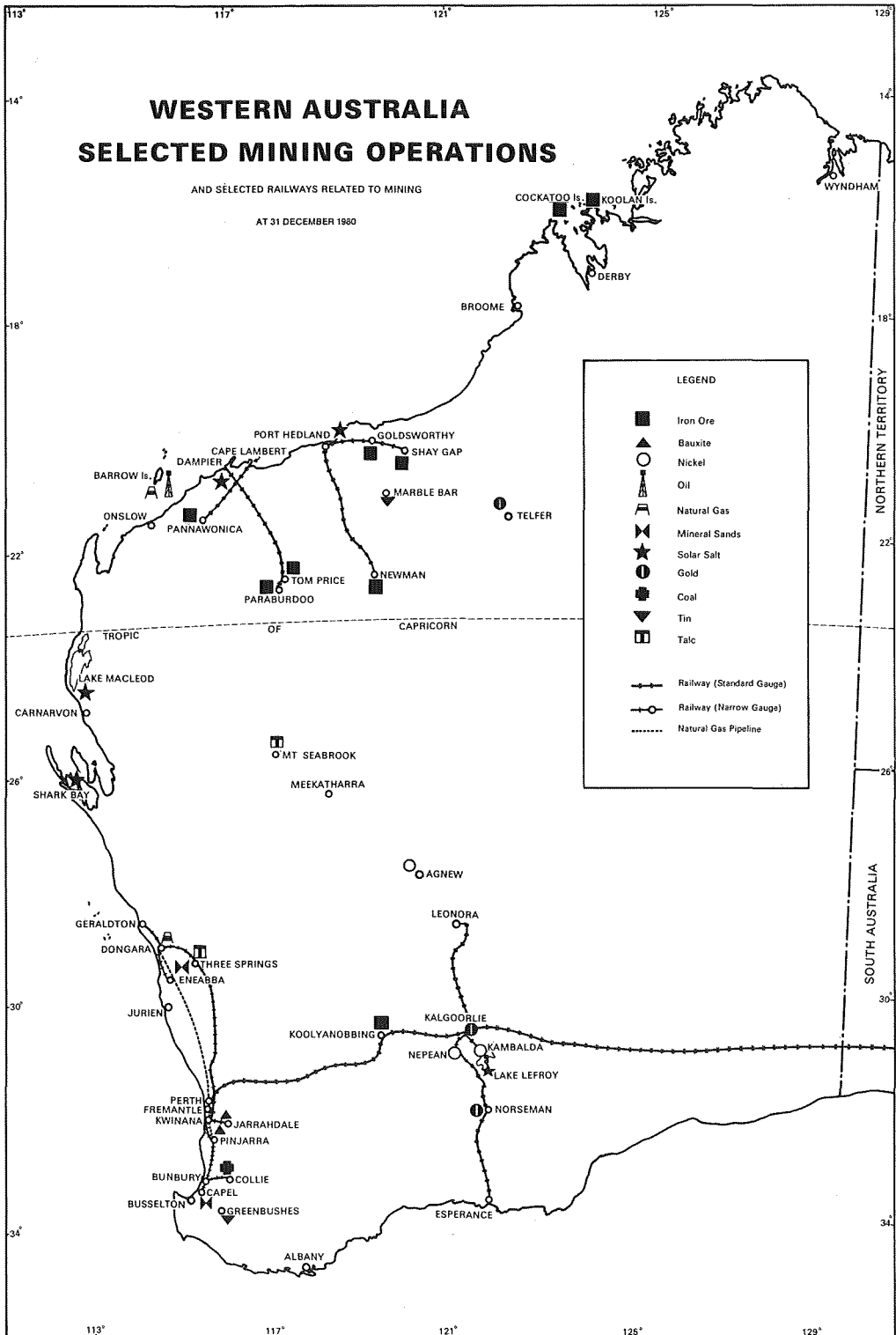
*Department of Industrial, Commercial and Regional Development*



# WESTERN AUSTRALIA SELECTED MINING OPERATIONS

AND SELECTED RAILWAYS RELATED TO MINING

AT 31 DECEMBER 1980



mining establishments (i.e. establishments at which mine development has commenced) and exclude mining leases at which only exploration is being carried out. The statistics, however, cover all exploration which continues on leases on which development or production has commenced. Separate details of exploration expenditure both on and off production leases are given in tables at the end of this Part.

The year-by-year comparisons in these tables indicate an increased growth rate in the mining industry in 1979-80, compared with the two preceding years. Employment increased for the first time since 1976-77, and apart from capital expenditure, the monetary indicators also showed significant increases. The decrease in capital expenditure resulted from the completion of construction of beneficiation plants in the iron ore industry — construction of these projects had resulted in the high levels of capital expenditure in the two preceding years.

#### MINING ESTABLISHMENTS — SUMMARY OF OPERATIONS BY INDUSTRY SUB-DIVISION: 1979-80

Industry sub-division		Number of establishments operating at 30 June	Persons employed (a)			Wages and salaries \$'000
ASIC code (b)	Description		Males	Females	Total	
11	Metallic minerals	73	11,123	1,303	12,426	229,535
12 - 13	Coal and crude petroleum	5	1,078	15	1,093	17,964
14	Construction materials	35	407	60	467	7,128
15	Other non-metallic minerals	40	519	78	597	10,751
Total mining		153	13,127	1,456	14,583	265,378

Industry sub-division		Stocks		Purchases, transfers in and selected expenses	Value added	Fixed capital expenditure
ASIC code (b)	Description	Turnover	Opening	Closing		
		\$'000	\$'000	\$'000	\$'000	\$'000
11	Metallic minerals	1,658,140	138,832	170,401	737,852	951,857
12 - 13	Coal and crude petroleum	185,316	9,385	12,090	25,080	162,941
14	Construction materials	35,723	2,539	2,863	18,316	17,730
15	Other non-metallic minerals	55,256	6,892	6,467	22,076	32,755
Total mining		1,934,435	157,649	191,821	803,324	1,165,283

(a) Average over whole year. (b) Australian Standard Industrial Classification.

#### MINING ESTABLISHMENTS — SUMMARY OF OPERATIONS

Item	Unit	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Number of establishments operating at 30 June	No.	134	129	134	126	135	153
Persons employed (a)							
Males	No.	13,630	13,302	13,608	12,999	12,594	13,127
Females	No.	1,301	1,402	1,328	1,248	1,202	1,456
Total	No.	14,931	14,704	14,936	14,247	13,796	14,583
Wages and salaries	\$'000	136,802	163,734	199,013	226,101	220,015	265,378
Turnover	\$'000	1,010,661	1,167,698	1,387,274	1,602,262	1,650,015	1,934,435
Closing stocks	\$'000	93,799	124,667	140,489	162,125	155,949	191,821
Purchases, transfers in and selected expenses	\$'000	370,552	403,240	505,570	668,049	687,298	803,324
Value added	\$'000	668,698	795,585	901,674	942,851	949,865	1,165,283
Fixed capital expenditure	\$'000	151,872	161,770	131,981	314,794	337,736	166,050

(a) Prior to 1977-78 at 30 June; from 1977-78 average over whole year.

The relative importance of metallic mineral mining in Western Australia compared with Australia is clearly illustrated in the table below. This table also reflects the greater importance of coal and petroleum mining in some other States compared with Western Australia. The relatively low contribution by construction materials in Western Australia, by comparison with Australia, is partly the result of sand and gravel not being included in the Western Australian figures.

**MINING ESTABLISHMENTS — PERSONS EMPLOYED AND VALUE ADDED BY INDUSTRY  
SUB-DIVISION: WESTERN AUSTRALIA AND AUSTRALIA, 1979-80**

Sub-division		Persons employed (a)				Value added			
		Western Australia		Australia		Western Australia		Australia	
ASIC code (b)	Description	No.	Per cent	No.	Per cent	\$'000	Per cent	\$'000	Per cent
11	Metallic minerals	12,426	85.2	32,908	45.8	951,857	81.7	2,532,857	45.2
12 - 13	Coal and crude petroleum	1,093	7.5	29,888	41.6	162,941	14.0	2,728,653	48.7
14	Construction materials	467	3.2	6,125	8.5	17,730	1.5	254,348	4.5
15	Other non-metallic minerals	597	4.1	2,895	4.0	32,755	2.8	92,728	1.7
Total mining		14,583	100.0	71,816	100.00	1,165,283	100.0	5,608,586	100.0

(a) Average over whole year.

(b) Australian Standard Industrial Classification.

**MINING ESTABLISHMENTS — SUMMARY OF OPERATIONS  
WESTERN AUSTRALIA AND AUSTRALIA**

Particulars	Year	Number of establishments operating at 30 June	Persons employed (a)	Wages and salaries	Turnover	Value added
Western Australia	1974-75	134	14,931	\$'000 136,802	\$'000 1,010,661	\$'000 668,698
	1975-76	129	14,704	163,734	1,167,698	795,585
	1976-77	134	14,936	199,013	1,387,274	901,674
	1977-78	126	14,247	226,101	1,602,262	942,851
	1978-79	135	13,796	220,015	1,650,015	949,865
	1979-80	153	14,583	265,378	1,934,435	1,165,283
Australia	1974-75	1,306	69,122	675,442	3,725,629	2,645,948
	1975-76	1,271	67,609	782,522	4,257,029	3,021,375
	1976-77	1,277	67,888	927,563	5,062,142	3,514,744
	1977-78	1,352	66,795	1,018,407	5,776,807	3,839,981
	1978-79	1,368	67,792	1,094,855	6,547,468	4,445,084
	1979-80	1,444	71,816	1,284,146	8,039,133	5,608,586
Western Australia as a percentage of Australia		Per cent	Per cent	Per cent	Per cent	Per cent
	1974-75	10.26	21.60	20.25	27.13	25.27
	1975-76	10.15	21.75	20.92	27.43	26.33
	1976-77	10.49	22.00	21.46	27.40	25.65
	1977-78	9.32	21.33	22.20	27.74	24.55
	1978-79	9.87	20.35	20.10	25.20	21.37
	1979-80	10.60	20.31	20.67	24.06	20.78

(a) Prior to 1977-78 at 30 June; from 1977-78 average over whole year.

The preceding tables indicate that mining establishments in Western Australia are generally larger than those in the rest of Australia and output per worker is generally higher, mainly because of the comparative magnitude and capital-intensive nature of the mining projects in Western Australia.

The importance of iron ore to Western Australia is also shown in the following table. Iron ore surpassed gold as the mineral with the highest annual value of production in 1966 and, since 1967, has accounted for more than half the annual value of minerals produced in this State despite production decreases in recent years. Other noteworthy features are the significant increases in the value of crude oil and gold production because of large increases in the prices of these commodities.



## MINERAL PRODUCTION — QUANTITY AND EX-MINE VALUE

Mineral	Unit	1977-78		1978-79		1979-80	
		Quantity	Value	Quantity	Value	Quantity	Value
			\$'000		\$'000		\$'000
Bauxite	'000 tonnes	10.891	n.p.	12.919	n.p.	13.309	n.p.
Clays — all kinds (a)	'000 tonnes	2.193	3.156	2.472	3.764	2.048	4.088
Coal	'000 tonnes	2.435	24.846	2.406	34.484	3.039	54.464
Construction materials —							
Building and monumental stone	'000 tonnes	19	253	85	779	38	335
Crushed and broken stone	'000 tonnes	4.134	18.399	4.173	21.035	3.833	23.334
Crushed and broken limestone	'000 tonnes	1.366	2.372	2.064	3.646	1.338	5.026
Crude oil (b)	'000 cu m	1.799	64.042	1.706	73.324	1.504	106.577
Felspar	tonne	740	15	1.132	28	2.430	113
Gold bullion	'000 grams	16.698	64.175	15.096	78.709	13.668	154.977
Gypsum	tonne	151.042	747	196.752	1.075	243.451	1.901
Iron ore and pellets (c)	'000 tonnes	84.942	797.323	78.845	823.780	91.519	992.868
Limestone for industrial purposes (d)	'000 tonnes	1.310	5.351	1.184	5.261	1.248	4.891
Mineral sands —							
Ilmenite	tonne	1,029.794	21.340	1,140.898	23.215	1,284.863	26.719
Leucoxene	tonne	17.423	2.265	18.994	2.497	26.584	4.471
Monazite	tonne	9.294	1.621	18.164	4.049	13.051	3.611
Rutile	tonne	112.222	21.543	90.070	16.828	106.047	24.098
Xenotime	tonne	16	15	20	19	24	29
Zircon	tonne	191.900	13.932	257.452	12.796	263.367	14.310
Natural gas	'000 cu m	816.950	n.p.	834.503	n.p.	861.797	n.p.
Nickel concentrate	tonne	466.638	n.p.	352.988	n.p.	347.039	n.p.
Ochre	tonne	173	3	135	2	222	4
Salt	'000 tonnes	4.468	31.348	4.493	31.639	4.248	32.184
Semi-precious stones	..	..	25	..	23	..	66
Talc	tonne	108.549	n.p.	127.382	n.p.	160.767	n.p.
Tantalite-columbite concentrate	kilogram	207.331	3.670	127.472	5.202	166.171	12.339
Tin concentrate	tonne	703	5.161	604	5.494	599	6.786
Other (value only) (e)	..	..	250.894	..	221.732	..	299.163
Total value	..	..	1,332.496	..	1,369.381	..	1,772.353

(a) Includes bentonite. (b) Value based on price per barrel published by Ampol Petroleum Limited. (c) Excludes ore used for pellet production. (d) Comprises limestone for agriculture, cement making, flux, glass making, lime burning and iron ore pelletising. (e) Includes those minerals for which values are not available for publication.

The following table sets out the contents of selected metallic minerals produced. Variations in the contents data shown in this table are, by and large, reflections of variations in production of the parent mineral.

### MINERAL PRODUCTION CONTENTS OF SELECTED METALLIC MINERALS

Mineral in which contained	1977-78	1978-79	1979-80
COPPER (tonnes)			
Nickel concentrate	4.839	3.474	3.117
Total, Copper	4.839	3.474	3.117
GOLD ('000 grams)			
Gold bullion	13.529	12.265	11.310
Nickel concentrate	123	56	287
Total, Gold	13.653	12.321	11.597
IRON ('000 tonnes)			
Iron ore and pellets (a)	53.768	49.755	57.896
Total, Iron	53.768	49.755	57.896
MONAZITE (b) (tonnes)			
Monazite concentrate	8.646	16.901	12.138
Total, Monazite (b)	8.646	16.901	12.138
NICKEL (tonnes)			
Nickel concentrate	56.850	43.944	43.182
Total, Nickel	56.850	43.944	43.182

**MINERAL PRODUCTION**  
**CONTENTS OF SELECTED METALLIC MINERALS**  
*continued*

Mineral in which contained	1977-78	1978-79	1979-80
<b>SILVER ('000 grams)</b>			
Gold bullion	1,406	1,577	1,504
Nickel concentrate	467	57	211
Total, Silver	1,873	1,634	1,715
<b>TANTALITE-COLUMBITE (kilograms)</b>			
Tantalite-columbite concentrate	89,040	(c) 63,771	(c) 69,113
Total, Tantalite-columbite	89,040	(c) 63,771	(c) 69,113
<b>TIN (tonnes)</b>			
Tin concentrate	507	432	417
Total, Tin	507	432	417
<b>TITANIUM DIOXIDE (tonnes)</b>			
Ilmenite concentrate	601,346	663,284	703,303
Leucoxene concentrate	16,284	16,873	24,156
Rutile concentrate	107,669	86,459	101,757
Total, Titanium dioxide	725,299	766,616	829,216
<b>ZIRCONIUM OXIDE (tonnes)</b>			
Zircon concentrate	126,753	170,499	174,792
Total, Zirconium oxide	126,753	170,499	174,792

(a) Excludes iron in ore for pellets. (b) Phosphate of rare earth metals. (c) Includes a small amount contained in tin concentrate.

## EXPLORATION FOR MINERALS

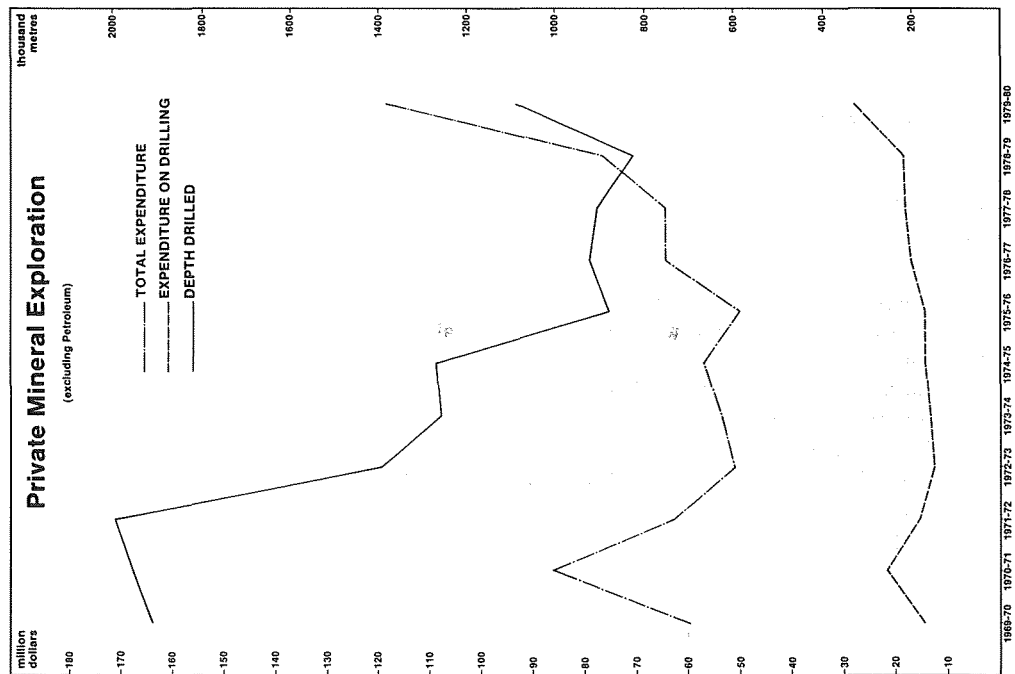
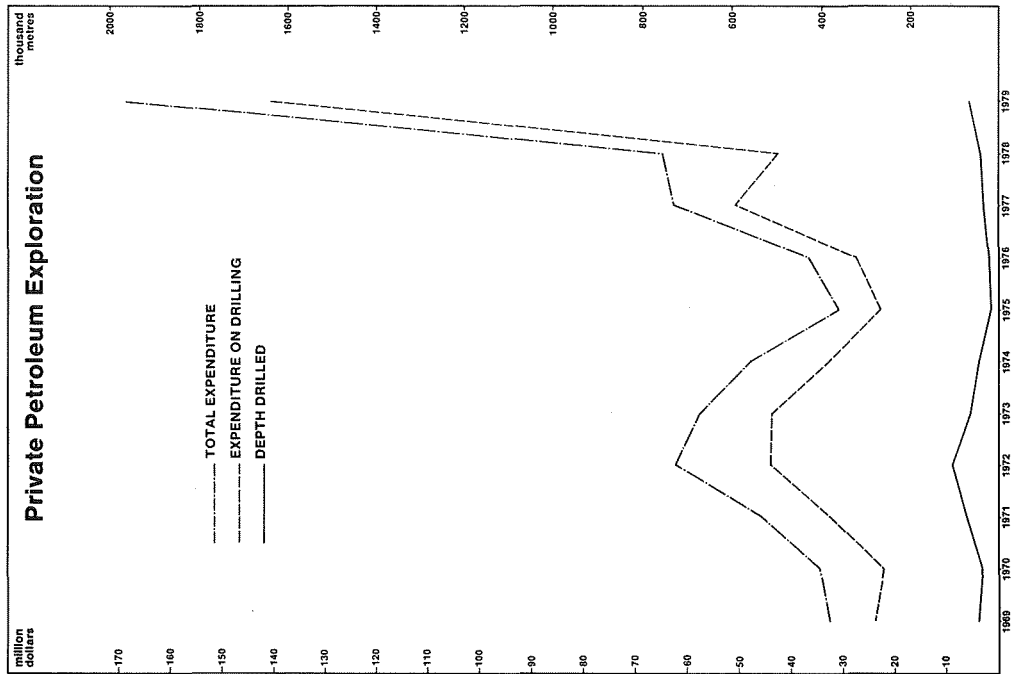
### Mineral Exploration (other than for Petroleum)

The data in this section have been derived from the annual Mineral Exploration Census (excluding Petroleum Exploration) which is carried out by the Australian Bureau of Statistics. The first census was conducted in respect of the year 1965 and for further information and statistics in greater detail, the reader is referred to the publication *Mineral Exploration* (Catalogue No. 8407.0) issued by the Australian Statistician, Canberra.

For the purposes of the census, mineral exploration consists of the search for and appraisal of new ore occurrences and known deposits of minerals (including extensions to deposits being worked) by geological, geophysical, geochemical, and other methods, including drilling. Exploration for water is excluded. The construction of shafts and adits is included if primarily for exploration purposes. Excluded are mine development activities (which include the construction of drives, shafts, winzes, etc.) in underground mines and the preparation of quarrying sites for open-cut extraction (including overburden removal) carried out primarily for the purpose of commencing or extending mining and quarrying operations.

Mineral exploration (other than for petroleum), covers a major portion of the State and is concerned chiefly with exploration for iron, nickel, copper, gold, lead, tin, bauxite, mineral sands, uranium, diamonds and coal.

In the next two tables, details are given of private and State Government exploration in Western Australia over the period 1974-75 to 1979-80.



**MINERAL EXPLORATION (OTHER THAN FOR PETROLEUM)  
EXPENDITURE AND DRILLING: 1979-80**

Particulars	Private exploration			State Government exploration (a)	Total (incl. State Government)
	On produc- tion leases	On other areas	Total		
Exploration expenditure (\$'000) —					
Wages and salaries	2,266	22,065	24,331	840	25,171
Stores, materials and fuels purchased	1,505	14,351	15,856	52	15,908
Payments to contractors, consultants, etc.	8,993	34,173	43,166	—	43,166
Other current expenses	1,685	26,219	27,903	—	27,903
Net capital expenditure	151	7,167	7,318	26	7,344
Total	14,600	103,974	118,574	919	119,493
Drilling expenditure (b) (\$'000) —					
On core drilling	5,408	11,982	17,390	—	17,390
On non-core drilling	2,168	8,810	10,978	—	10,978
Total	7,576	20,792	28,368	—	28,368
Drilling operations ('000 metres) —					
Core drilling	97	255	352	—	352
Non-core drilling	155	584	739	—	739
Total	251	840	1,091	—	1,091

(a) Exploration by the Western Australian Department of Mines. (b) Included in 'Exploration expenditure' above.

From 1965, expenditure on private exploration in Western Australia rose from \$3,948,000 to a peak of \$86,082,000 in 1970-71. This peak came as the culmination of a period of activity which commenced with the discovery of nickel at Kambalda in 1966 and during which there was a significant increase in expenditure on mineral exploration. This period, which became known as the 'nickel boom', was followed by a period of declining exploration activity, and by 1975-76 private exploration expenditure had fallen to \$50,123,000. Notwithstanding the rate of inflation throughout the 1970s, it was not until 1979-80, when private expenditure on exploration reached \$118,574,000, that the peak of 1970-71 was exceeded. Expenditure on drilling has fluctuated similarly, with the 1970-71 expenditure of \$21,507,000 remaining as the highest on record until 1979-80, when drilling expenditure of \$28,368,000 was recorded. However, actual drilling activity, as measured in terms of metres drilled, shows an almost continuous decline from 1971-72 to 1978-79. The 1,091,000 metres of drilling carried out in 1979-80, while representing a 32 per cent increase over the 1978-79 figure, was still only a little over half the level recorded in 1971-72.

These fluctuations in expenditure and depth drilled are clearly evident in the graph on the previous page.

**MINERAL EXPLORATION (OTHER THAN FOR PETROLEUM) (a)  
EXPENDITURE AND DRILLING**

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Exploration expenditure (\$'000) —						
Wages and salaries	15,515	13,789	15,639	16,478	17,693	25,171
Stores, materials and fuels purchased	6,473	5,656	6,315	7,768	8,151	15,908
Payments to contractors, consultants, etc.	19,991	16,763	22,346	21,651	25,943	43,166
Other current expenses	12,442	12,400	16,624	17,039	21,875	27,903
Net capital expenditure	3,296	2,180	4,377	2,611	3,880	7,344
Total	57,718	50,788	65,301	65,548	77,541	119,493
Drilling expenditure (b) (\$'000) —						
On core drilling	8,307	8,022	10,859	10,075	11,052	17,390
On non-core drilling	5,812	6,216	6,143	8,055	7,618	10,978
Total	14,119	14,238	17,002	18,130	18,671	28,368
Drilling operations ('000 metres) —						
Core drilling	253	196	168	176	187	352
Non-core drilling	1,012	681	754	728	637	739
Total	1,266	877	922	904	824	1,091

(a) Includes exploration by the Western Australian Department of Mines. (b) Included in 'Exploration expenditure' above.

The two tables that follow show details of private exploration classified by the type of mineral sought and by the size of the enterprise group involved in the exploration. From the first table it can be seen that, until recently, nearly all mineral exploration activity (apart from petroleum exploration) was directed to seeking metallic minerals. More recently, an increasing proportion of exploration expenditure is being directed to the search for diamonds, and to a lesser extent coal.

The most notable feature of the second table is the predominance of the larger enterprise groups in mineral exploration. Expenditure on exploration by enterprise groups spending in excess of one million dollars was over 70 per cent of total expenditure in 1979-80, although such groups accounted for only 8.2 per cent of the number of explorers.

PRIVATE MINERAL EXPLORATION (OTHER THAN FOR PETROLEUM)  
EXPENDITURE BY TYPE OF MINERAL SOUGHT  
(\$'000)

Type of mineral sought	Total private exploration					
	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Mineral sands	2,149	2,496	1,631	290	183	425
Uranium	2,502	2,291	5,191	6,157	10,058	11,489
Iron ore			13,942	10,418	7,991	10,379
Copper, lead, zinc, silver, nickel, cobalt	50,210	42,032	37,724	42,245	40,943	35,826
Gold						21,520
Tin, tungsten						2,418
Other metallic minerals						3,317
Coal	733	394	385	988	1,438	4,709
Construction materials				15	12	82
Diamonds	1,548	2,910	5,696	4,665	16,144	26,886
Other non-metallic minerals						1,523
Total	57,143	50,123	64,569	64,778	76,769	118,574

PRIVATE MINERAL EXPLORATION (OTHER THAN FOR PETROLEUM)  
ENTERPRISE GROUPS (a) CLASSIFIED BY SIZE OF EXPENDITURE

Size of total expenditure of enterprise groups on mineral exploration	Expenditure						Enterprise groups	
	On production leases		On other areas		Total exploration			
	\$'000	Per cent	\$'000	Per cent	\$'000	Per cent	No.	Per cent
1978-79								
\$10,000 and under	8	—	220	0.3	228	0.3	62	29.4
\$10,001 to \$25,000	41	0.1	410	0.5	450	0.6	28	13.3
\$25,001 to \$50,000	45	0.1	602	0.8	646	0.8	19	9.0
\$50,001 to \$100,000	149	0.2	1,606	2.1	1,755	2.3	26	12.3
\$100,001 to \$250,000	229	0.3	3,451	4.5	3,680	4.8	23	10.9
\$250,001 to \$500,000	250	0.3	9,098	11.9	9,348	12.2	25	11.8
\$500,001 to \$1,000,000	775	1.0	8,319	10.8	9,093	11.8	14	6.6
\$1,000,001 to \$2,500,000	991	1.3	12,312	16.0	13,303	17.3	8	3.8
Over \$2,500,000	7,655	10.0	30,608	39.9	38,264	49.8	6	2.8
Total 1978-79	10,143	13.2	66,626	86.8	76,769	100.0	211	100.0
1979-80								
\$10,000 and under	48	—	185	0.2	234	0.2	68	28.0
\$10,001 to \$25,000	122	0.1	512	0.4	634	0.5	38	15.6
\$25,001 to \$50,000	100	0.1	632	0.5	723	0.6	20	8.2
\$50,001 to \$100,000	211	0.2	1,274	1.1	1,485	1.3	19	7.8
\$100,001 to \$250,000	189	0.2	4,484	3.8	4,673	3.9	29	11.9
\$250,001 to \$500,000	434	0.4	9,720	8.2	10,154	8.6	27	11.1
\$500,001 to \$1,000,000	2,045	1.7	14,478	12.2	16,523	13.9	22	9.1
\$1,000,001 to \$2,500,000	2,530	2.1	17,678	14.9	20,207	17.0	13	5.3
Over \$2,500,000	8,921	7.5	55,020	46.4	63,941	53.9	7	2.9
Total 1979-80	14,600	12.3	103,974	87.7	118,574	100.0	243	100.0

(a) For the purposes of this table, the total exploration activities of an enterprise group (i.e. a group of companies which are related in terms of the Companies Act) are considered to relate to a single unit, irrespective of the number of returns completed or the number of types of activity in which it engaged.

### Petroleum Exploration

Petroleum exploration is defined as consisting of the search for, and appraisal of, deposits of crude oil and gas by geological, geophysical, geochemical and other means, including drilling. Included in the expenditure are the costs of drilling and testing exploratory oil and gas wells. Also included are the costs of access roads, site construction, permits, licences and similar fees, relevant office buildings and furniture, transportation equipment, storage facilities, plant and equipment and review work if primarily for the purposes of exploration for deposits of crude oil or natural gas. Details of drilling developmental wells and expenditure on production facilities, and pipelines, and production costs, etc. are excluded.

An extensive programme of oil exploration commenced in 1952 and resulted in the discovery of flow oil in the Exmouth Gulf area of the Carnarvon Basin in 1953. The discovery proved to be of non-commercial significance, but it stimulated further exploration for oil in Western Australia. A large area of the State has now been scientifically examined and geophysical and geological surveys are still being carried out. Discoveries of petroleum have been made at Barrow Island and Yardarino (1964), at Gingin (1965), at Dongara (1966), at Pascoe Island (1967) and at Mondarra (1968).

In recent years, exploration off the coast of Western Australia has resulted in the discovery of considerable reserves of natural gas over an area of the north-west continental shelf, north of 21° S latitude. Further details on this exploration appear at the beginning of this Part and in Chapter II, Part 1.

Information on petroleum exploration expenditure and on drilling in Western Australia for the six years 1974 to 1979 is given in the tables below. These figures have been compiled from data published by the Bureau of Mineral Resources, Geology and Geophysics.

The tables show a significant increase in exploration expenditure in recent years, and particularly in 1979, when expenditure was 160 per cent higher than in the previous year. This partly reflects the high cost of drilling in the off-shore waters of the North West Shelf and the Exmouth Plateau where a significant proportion of the State's exploration is being carried out. The amount of drilling carried out has also increased, although not to the same extent as expenditure.

#### PRIVATE PETROLEUM EXPLORATION EXPENDITURE AND SOURCE OF FUNDS (\$'000)

Particulars	1974	1975	1976	1977	1978	1979
Private expenditure (a) —						
Geological	855	801	329	536	1,187	1,163
Geophysical	5,365	3,307	6,323	3,724	16,306	14,247
Drilling	32,579	22,646	27,396	50,810	42,669	140,284
Other	9,124	4,122	2,794	7,375	4,697	12,972
Total	47,923	30,875	36,842	62,445	64,859	168,666
Source of funds —						
Private sources	45,281	29,527	36,842	62,445	64,859	168,666
Government subsidy (b)	2,642	1,348	—	—	—	—

(a) Includes expenditure financed by payments under the *Petroleum Search Subsidy Act 1959* (Commonwealth). (b) Comprises payments under the *Petroleum Search Subsidy Act 1959*.

## PRIVATE PETROLEUM EXPLORATION — WELLS AND DEPTH DRILLED

Particulars	Unit	1974	1975	1976	1977	1978	1979
<b>Wells —</b>							
Drilled (i.e. those which reached final depth) —							
As oil producers	No.	—	—	—	—	2	1
As gas producers	No.	1	1	1	—	—	—
As oil and gas producers	No.	1	1	—	—	—	—
Plugged and abandoned	No.	19	7	4	9	17	17
<b>Total</b>	<b>No.</b>	<b>21</b>	<b>9</b>	<b>5</b>	<b>9</b>	<b>19</b>	<b>18</b>
Average final depth of wells drilled	metre	2,365	1,939	2,922	3,024	2,511	3,401
Drilling still in progress at 31 December (uncompleted holes)	No.	—	1	2	3	1	3
Drilled or drilling over 3,000 metres	No.	8	3	4	8	9	14
<b>Depth drilled —</b>							
Completed wells	metre	46,203	17,501	17,534	23,307	37,538	58,623
Uncompleted holes	metre	—	620	4,017	10,176	2,917	7,850
<b>Total</b>	<b>metre</b>	<b>46,203</b>	<b>18,121</b>	<b>21,551</b>	<b>33,483</b>	<b>40,455</b>	<b>66,473</b>

## *Chapter VIII—continued*

### **Part 3 — Manufacturing**

Manufacturing in Western Australia does not have the relative importance to manufacturing in Australia which applies to the State's mining industry. Nevertheless, value added (see definition at the beginning of this Chapter) by manufacturing establishments in Western Australia in 1978-79 was \$1,322 million, or \$372 million more than value added by the State's mining establishments. This value added, however, was only 5.9 per cent of all value added by manufacturing establishments in Australia and was \$1,073 per head of mean population compared with the national average of \$1,551.

Owing to the inclusion of manufacturing in the system of integrated economic censuses in 1968-69 it is not possible to compare the statistics in this Part with manufacturing statistics for years prior to 1968-69. The statistics up to 1967-68, however, which are available in the Statistical Summary following Chapter X and in earlier issues of the Year Book, provide a consistent historical record back to the year 1900. At that time 632 factories employing 11,166 persons were recorded, compared with 5,404 factories in 1967-68, employing 67,335 persons.

Up to the early 1950s, manufacturing in Western Australia had grown steadily with some surge in growth during each of the World Wars and a pronounced down-turn during the depression of the early 1930s. Most of the factories were small and medium-sized establishments supplying the small local market and carrying out some processing of the State's primary products for export. The long-established industries such as slaughtering, dairy products processing, brewing, baking, wool scouring, sawmilling, printing, building materials production and the various types of metal fabrication and engineering remain as important components of manufacturing in the State.

Heavy industry and large-scale operations have been a more recent development, although it could be said that heavy industry commenced with the establishment in 1948 of the State Government's wood distillation, charcoal, iron and steel plant at Wundowie, east of Perth in the Shire of Northam. This plant, which was sold by the Government in 1974, was converted to the treatment of vanadium ores in early 1981. Perhaps the most significant change, however, came when the basis for an integrated industrial complex was established with the opening in 1954 of a large oil refinery at Kwinana, on Cockburn Sound south of Perth. This was followed soon after by a steel rolling mill and later by a series of large plants which have made Kwinana the State's major industrial centre. The interrelated complex of metals, fuels and chemicals plants is served by a fine harbour, a standard gauge railway line linked with mining centres and the other States, and a pipeline from the natural gasfields north of Perth.

The major part of the more recent development of heavy industry in Western Australia has been associated with mineral development (see Part 2 of this Chapter). Three of the plants in the Kwinana complex are directly concerned with metals processing. A blast furnace, which began operating in 1968, uses iron ore from Koolyanobbing, some 480 kilometres to the east. An alumina refinery, which commenced operations in 1964, processes bauxite mined in the Darling Range and railed about forty-eight kilometres from a crushing plant at Jarrahdale. A nickel refinery, which commenced operations in 1970, processes nickel concentrates and matte transported from Kambalda and Kalgoorlie. Major mineral-processing



plants outside Kwinana also contribute to Western Australia's manufacturing industry. A nickel smelter, to produce nickel matte from concentrates, commenced operations at Kalgoorlie in 1973 and another alumina refinery, at Pinjarra, began operating in 1972. A plant at Australind, near Bunbury, which extracts titanium dioxide from ilmenite mined in the surrounding districts, has been in operation since 1963.

Besides providing for heavy industry directly associated with minerals processing, the mining developments of recent years have also given impetus to other manufacturing activity, particularly to industries associated with the provision of capital equipment and other manufactured goods for the major mining projects.

## MANUFACTURING STATISTICS

In the Australian Standard Industrial Classification manufacturing is used in the broad sense to relate to the physical or chemical transformation of materials or components into new products. Certain activities, however, which do not fit easily into this definition are included or excluded from manufacturing according to other criteria. Activities which are *included* as manufacturing are grading, testing, filtering, cooling and bulk handling of milk; cotton ginning; publishing, electrotyping, signwriting and bookbinding; installation of lifts and escalators; repair activity usually associated with manufacturing (e.g. engine reconditioning, repair of industrial machinery, ship repair and major repair of aircraft and railway rolling stock); and blending, assembly, bottling and repacking except where otherwise stated. Activities which are *excluded* from manufacturing are washing, packing and dehydrating of fresh fruit; sun-drying of fruit; cleaning or filleting of fish on commission or freezing of whole fish; pulping of eggs; bottling of wine and spirits; repacking of flour, cereal food products and dried fruits; blending or repacking of tea; the making or installation of curtains; custom tailoring and dressmaking; boot and shoe repairs; hewing or rough-shaping of railway sleepers, posts, etc. in the forests; installation of joinery and erection of prefabricated wooden buildings; screening, crushing, dressing or other rudimentary treatment of minerals and construction materials; purification of natural gas; blending of lubricating oils and greases; glazing; motor vehicle repair (except engine reconditioning); repair of household appliances, sporting and photographic equipment, watches, clocks and jewellery, etc.; repair of tractors, and farm and construction machinery; and installation of structural steel, air-conditioning and heating equipment, industrial furnaces or shop fittings.

Production and distribution of electricity and gas are not regarded as manufacturing in the Australian Standard Industrial Classification (ASIC) but are included in a separate Industry Division (Division D: Electricity, Gas and Water). Further details of electricity and gas appear at the end of this Part.

The following tables summarise the results for Western Australia of the Census of Manufacturing Establishments conducted annually since 1972-73. Definitions of the data items used are contained in the introduction to this Chapter. While the statistics that follow relate mainly to ASIC Industry Sub-divisions, most data items presented are also available at Industry Group and Industry Class levels.

As from the 1975-76 Census, only a limited range of data — employment, and wages and salaries — is being collected from single establishment manufacturing enterprises with less than four persons employed. To facilitate comparisons with previous years, the 1974-75 Census data were published in such a way that a link was provided between past and future series.

The table below relates to manufacturing establishments from which the full range of data is collected under the new collection criteria (i.e. all manufacturing establishments owned by multi-establishment enterprises and single establishment manufacturing enterprises with four or more

persons employed). The succeeding table relates to single establishment manufacturing enterprises with less than four persons employed (i.e. enterprises from which only employment, and wages and salaries data are being collected). As can be readily seen, enterprises in this category contribute only marginally to statistical aggregates other than number of establishments. Data in respect of the larger manufacturers therefore provide reliable information for the evaluation of trends in the manufacturing sector of the economy. All other manufacturing census data presented in this Part relate to manufacturing establishments owned by multi-establishment enterprises and single establishment manufacturing enterprises with four or more persons employed.

### MANUFACTURING ESTABLISHMENTS SUMMARY OF OPERATIONS ACCORDING TO INDUSTRY SUB-DIVISION: 1978-79

(Manufacturing establishments of multi-establishment enterprises, and single establishment manufacturing enterprises employing four or more persons.)

Industry sub-division		Number of establishments operating at 30 June	Persons employed (average over whole year) (a)			Wages and salaries (b)
ASIC code (c)	Description		Males	Females	Persons	
						\$'000
21	Food, beverages and tobacco	333	9,121	3,839	12,960	129,789
23	Textiles	29	505	296	801	7,494
24	Clothing and footwear	49	277	1,151	1,428	9,790
25	Wood, wood products and furniture	411	6,214	1,167	7,381	62,241
26	Paper, paper products, printing and publishing	169	4,395	1,738	6,133	60,589
27	Chemical, petroleum and coal products	65	2,794	397	3,191	42,436
28	Non-metallic mineral products	194	4,678	381	5,059	58,384
29	Basic metal products	35	5,197	351	5,548	75,749
31	Fabricated metal products	375	7,157	1,226	8,383	81,616
32	Transport equipment	151	5,202	246	5,448	53,317
33	Other machinery and equipment	240	5,967	890	6,857	71,259
34	Miscellaneous manufacturing	151	1,494	549	2,043	18,107
Total manufacturing		2,202	53,001	12,231	65,232	670,772

Industry sub-division		Stocks		Purchases, transfers in and selected expenses	Value added	Fixed capital expenditure
ASIC code (c)	Description	Turnover	Opening	Closing		
		\$'000	\$'000	\$'000	\$'000	\$'000
21	Food, beverages and tobacco	883,276	54,718	68,585	630,330	266,814
23	Textiles	30,672	4,666	5,452	18,909	12,550
24	Clothing and footwear	22,456	2,122	2,734	9,809	13,259
25	Wood, wood products and furniture	242,513	33,629	38,211	131,820	115,275
26	Paper, paper products, printing and publishing	193,217	18,926	19,489	87,318	106,462
27	Chemical, petroleum and coal products	260,095	36,356	36,003	154,741	105,001
28	Non-metallic mineral products	266,161	41,163	45,658	149,894	120,762
29	Basic metal products	782,339	202,336	165,376	530,947	214,431
31	Fabricated metal products	340,313	44,626	47,407	204,298	138,796
32	Transport equipment	134,343	13,851	16,365	63,744	73,114
33	Other machinery and equipment	255,293	49,996	52,845	138,736	119,407
34	Miscellaneous manufacturing	88,149	9,569	12,267	55,036	35,812
Total manufacturing		3,498,828	511,959	510,393	2,175,579	1,321,683

(a) Includes working proprietors. (b) Excludes amounts drawn by working proprietors. (c) Australian Standard Industrial Classification.

**MANUFACTURING ESTABLISHMENTS**  
**SUMMARY OF OPERATIONS ACCORDING TO INDUSTRY SUB-DIVISION: 1978-79**  
 (Single establishment manufacturing enterprises with less than four persons employed.)

Industry sub-division		Number of establishments operating at 30 June	Persons employed (average over whole year) (a)			Wages and salaries (b)
ASIC code (c)	Description		Males	Females	Persons	
21	Food, beverages and tobacco	84	117	60	177	\$'000 347
23	Textiles	26	29	22	51	118
24	Clothing and footwear	23	13	30	43	79
25	Wood, wood products and furniture	332	525	134	659	1,191
26	Paper, paper products, printing and publishing	108	145	64	209	387
27	Chemical, petroleum and coal products	24	34	9	43	145
28	Non-metallic mineral products	55	92	14	106	291
29	Basic metal products	11	16	4	20	40
31	Fabricated metal products	224	360	92	452	1,132
32	Transport equipment	81	134	26	160	315
33	Other machinery and equipment	135	188	59	247	558
34	Miscellaneous manufacturing	167	231	79	310	521
Total manufacturing		1,270	1,884	593	2,477	5,123

(a) Includes working proprietors. (b) Excludes amounts drawn by working proprietors. (c) Australian Standard Industrial Classification.

The remaining tables show data for the restricted scope of establishments for 1974-75 to 1978-79, but data for 1973-74 relates to all establishments regardless of size.

**MANUFACTURING ESTABLISHMENTS — SUMMARY OF OPERATIONS**

Item	Unit	1973-74	1974-75 (a)	1975-76 (a)	1976-77 (a)	1977-78 (a)	1978-79 (a)
Number of establishments operating at 30 June	No.	2,818	1,974	2,054	2,035	2,037	2,202
Persons employed (including working proprietors) —							
Average over whole year —							
Males	No.	54,402	53,207	53,696	54,337	53,336	53,001
Females	No.	13,482	12,645	12,257	12,413	12,404	12,231
Total	No.	67,884	65,852	65,953	66,750	65,740	65,232
Wages and salaries (excluding amounts drawn by working proprietors)	\$'000	346,942	434,272	508,931	594,514	629,095	670,772
Turnover	\$'000	1,741,029	2,034,274	2,435,754	2,886,221	3,031,505	3,498,828
Stocks —							
Opening	\$'000	190,532	217,754	298,226	351,782	411,253	511,959
Closing	\$'000	223,638	297,031	353,762	430,140	533,319	510,393
Purchases, transfers in, and selected expenses r	\$'000	1,129,997	1,350,359	1,565,878	1,835,492	1,971,617	2,175,579
Value added r	\$'000	644,139	763,192	925,412	1,129,089	1,181,953	1,321,683
Fixed capital expenditure	\$'000	86,995	102,849	157,779	133,923	173,685	214,316

(a) All manufacturing establishments owned by multi-establishment enterprises, and single establishment manufacturing enterprises with four or more persons employed. Excludes single establishment manufacturing enterprises with less than four persons employed.

**MANUFACTURING ESTABLISHMENTS — WESTERN AUSTRALIA AND AUSTRALIA  
PERSONS EMPLOYED AND VALUE ADDED BY INDUSTRY SUB-DIVISION: 1978-79**

Industry sub-division		Persons employed (average over whole year) (a)				Value added			
ASIC code (b)	Description	Western Australia		Australia		Western Australia		Australia	
		No.	per cent of total	No.	per cent of total	\$'000	per cent of total	\$'000	per cent of total
21	Food, beverages and tobacco	12,960	19.87	189,655	16.58	266,814	20.19	4,035,499	18.15
23	Textiles	801	1.23	36,528	3.19	12,550	0.95	641,521	2.89
24	Clothing and footwear	1,428	2.19	80,880	7.07	13,259	1.00	1,049,425	4.72
25	Wood, wood products and furniture	7,381	11.31	74,458	6.51	115,275	8.72	1,194,015	5.37
26	Paper, paper products, printing and publishing	6,133	9.40	98,042	8.57	106,462	8.06	1,960,833	8.82
27	Chemical, petroleum and coal products	3,191	4.89	61,777	5.40	105,001	7.94	1,898,820	8.54
28	Non-metallic mineral products	5,059	7.76	44,987	3.93	120,762	9.14	1,088,532	4.90
29	Basic metal products	5,548	8.51	90,001	7.87	214,431	16.22	2,357,657	10.61
31	Fabricated metal products	8,383	12.85	105,852	9.25	138,796	10.50	1,853,335	8.34
32	Transport equipment	5,448	8.35	136,797	11.96	73,114	5.53	2,199,601	9.89
33	Other machinery and equipment	6,857	10.51	160,406	14.02	119,407	9.03	2,769,654	12.46
34	Miscellaneous manufacturing	2,043	3.13	64,508	5.64	35,812	2.71	1,181,230	5.31
Total manufacturing		65,232	100.00	1,143,891	100.00	1,321,683	100.00	22,230,122	100.00

(a) Includes working proprietors.

(b) Australian Standard Industrial Classification.

Most of the manufacturing establishments in Western Australia are located in the Perth Statistical Division (see map inside back cover). The accompanying table shows that in 1978-79 this Division had 81 per cent of the State's manufacturing establishments with 76 per cent of value added in all manufacturing establishments. While manufacturing is carried out in most local government areas within the Perth Statistical Division, major concentrations of establishments are found in certain localities. The large industrial complex at Kwinana has already been mentioned. The City of Stirling, however, had the largest number of establishments of all local government areas in the Division at 30 June 1979 including a major industrial area located at Osborne Park producing a wide range of products.

The City of Fremantle contains a major industrial area at O'Connor, east of the city centre, as well as a number of major factories north and south of Fremantle. Included in the City of Perth are a cement works, a variety of food and clothing factories, and numerous printing and publishing establishments. The City of Canning contains a major industrial area located at Welshpool and a brewery in the locality of Canning Vale. The localities of Coogee and Spearwood in the City of Cockburn have a number of the larger factories, including wool scouring and meat products establishments. The Midland locality in the Shire of Swan contains large Government railway workshops, which contribute significantly to employment in the area. Other local government areas with large manufacturing establishments are the Shire of Bayswater, the Town of Bassendean and the Cities of Subiaco and Belmont.

Measured in terms of employment (average over whole year), the most important concentrations of manufacturing activity outside the Perth Statistical Division were in the City of Bunbury and the Shires of Manjimup and Harvey in the South-West Statistical Division, the Town of Albany in the Lower Great Southern Statistical Division and the Shire of Roebourne in the Pilbara Statistical Division.

# MANUFACTURING ESTABLISHMENTS — WESTERN AUSTRALIA SUMMARY OF OPERATIONS BY STATISTICAL DIVISION: 1978-79

(Manufacturing establishments of multi-establishment enterprises and single establishment manufacturing enterprises employing four or more persons.)

Statistical division (a)	Number of establishments operating at 30 June	Persons employed (average over whole year) (b)	Wages and salaries (c)	Turnover	Closing stocks	Value added
			\$'000	\$'000	\$'000	\$'000
Perth Statistical Division	1,777	55,001	562,809	2,650,268	424,570	1,005,799
Other divisions —						
South-West	172	n.p.	n.p.	n.p.	n.p.	n.p.
Lower Great Southern	51	1,664	15,964	84,753	11,695	28,360
Upper Great Southern	24	214	1,515	6,702	410	2,956
Midlands	50	761	7,423	46,528	7,245	12,433
South-Eastern	38	813	9,167	140,031	8,514	45,271
Central	50	870	8,335	73,901	12,347	20,882
Pilbara	32	539	7,480	19,694	1,647	11,355
Kimberley	8	n.p.	n.p.	n.p.	n.p.	n.p.
Total	425	10,231	107,963	848,560	85,823	315,884
WESTERN AUSTRALIA	2,202	65,232	670,772	3,498,828	510,393	1,321,683

(a) For component local government areas, see lists at the end of the Chapter III. (b) Includes working proprietors. (c) Excludes amounts drawn by working proprietors.

The relationship between manufacturing in this State and manufacturing in Australia over recent years may be seen from the data in the following table. Western Australia is not a major manufacturing State and although, in recent years, there has been continuous development and expansion in this sector in Western Australia, the rate of expansion and development is only marginally greater than the rate for Australia as a whole.

## MANUFACTURING ESTABLISHMENTS — WESTERN AUSTRALIA AND AUSTRALIA SUMMARY OF OPERATIONS

Area	Year	Number of establishments operating at 30 June	Persons employed (average over whole year) (a)	Wages and salaries (b)	Turnover	Value added r
				\$m	\$m	\$m
Western Australia	1973-74 (c)	2,818	67,884	346.9	1,741.0	644.1
	1974-75 (c) (d)	1,974	65,852	434.3	2,034.3	763.2
	1975-76 (c) (d)	2,054	65,953	508.9	2,435.8	925.4
	1976-77 (c) (d)	2,035	66,750	594.5	2,886.2	1,129.1
	1977-78 (c) (d)	2,016	65,800	639.0	3,079.6	1,170.7
	1977-78 (d) (e)	2,037	65,740	629.1	3,031.5	1,182.0
	1978-79 (d) (e)	2,202	65,232	670.8	3,498.8	1,321.7
Australia	1973-74 (c)	37,143	1,338,379	7,176.4	31,246.7	12,886.4
	1974-75 (c) (d)	26,973	1,245,237	8,533.5	35,135.6	14,912.9
	1975-76 (c) (d)	27,507	1,200,440	9,472.4	39,488.4	16,555.8
	1976-77 (c) (d)	26,780	1,175,831	10,535.8	44,816.2	18,814.2
	1977-78 (c) (d)	25,998	1,146,028	11,152.8	48,198.9	19,753.6
	1977-78 (d) (e)	26,065	1,144,549	11,137.6	48,097.4	19,754.4
	1978-79 (d) (e)	26,312	1,143,891	11,966.4	55,211.3	22,230.1
Western Australia as a percentage of Australia	1973-74 (c)	7.59	5.07	4.83	5.57	5.00
	1974-75 (c) (d)	7.32	5.29	5.09	5.79	5.12
	1975-76 (c) (d)	7.47	5.49	5.37	6.17	5.59
	1976-77 (c) (d)	7.60	5.68	5.64	6.44	6.00
	1977-78 (c) (d)	7.75	5.74	5.73	6.39	5.93
	1977-78 (d) (e)	7.82	5.74	5.65	6.30	5.98
	1978-79 (d) (e)	8.37	5.70	5.61	6.34	5.95

(a) Includes working proprietors. (b) Excludes amounts drawn by working proprietors. (c) Based on 1969 edition of ASIC. (d) Excludes single establishment manufacturing enterprises with less than four persons employed at the end of June. (e) Based on 1978 edition of ASIC.



*Department of Tourism*  
 PLATE 11 — City of Bunbury — Western  
 Australia's first city outside the Perth  
 Statistical Division.

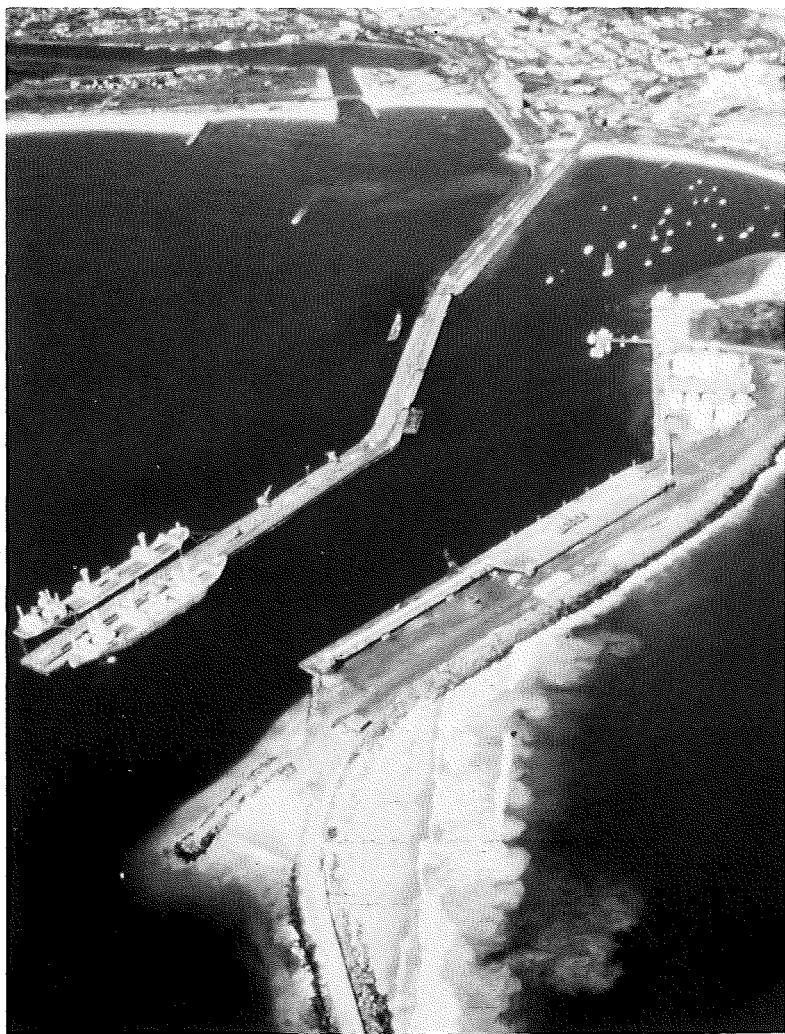
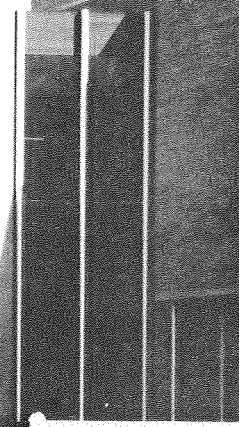
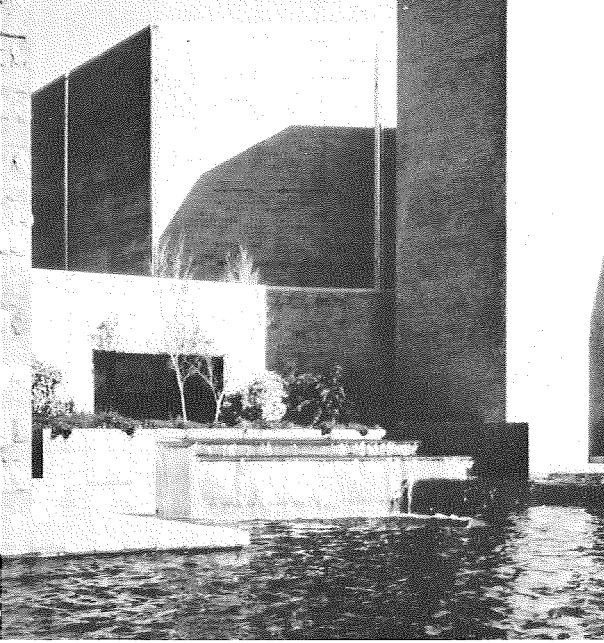


PLATE 12 — Port of Bunbury — Bunbury  
 Outer Harbour  
*Department of Industrial, Commercial and Regional  
 Development.*



Main Entrance.

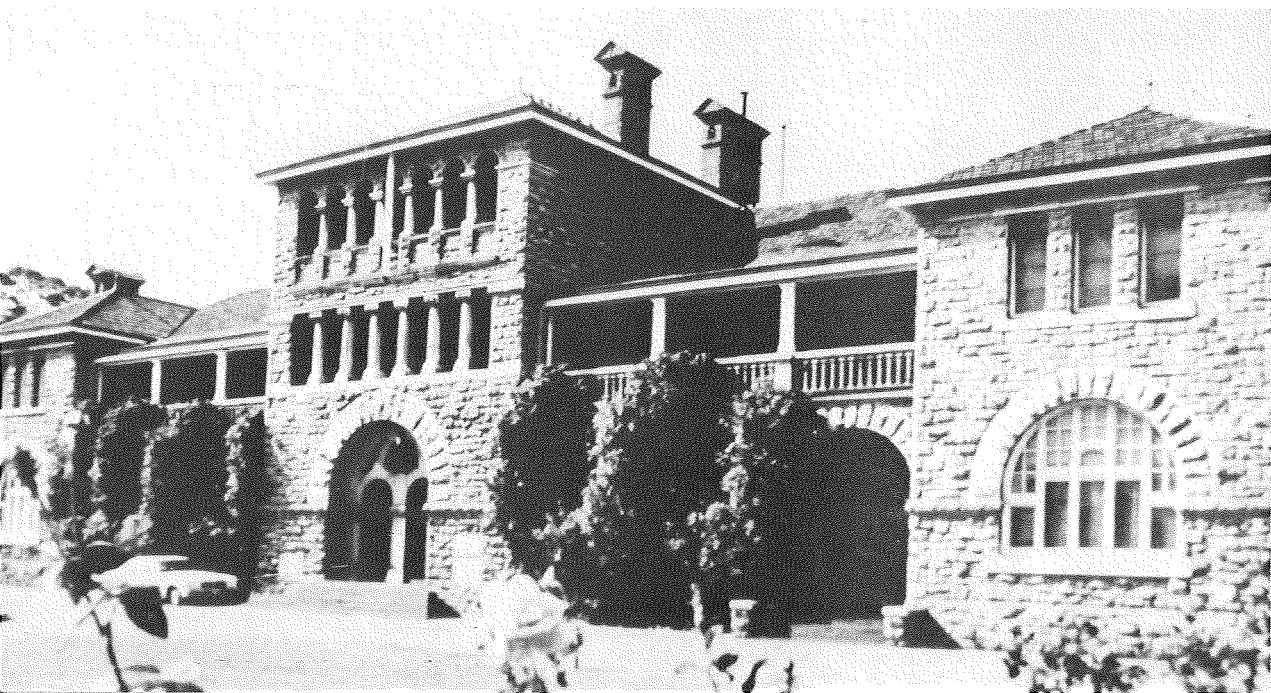
PLATE 14 — One of the seven major galleries.

*Art Gallery of Western Australia.*



PLATE 15 — The Perth Mint — Opened as a Branch of the Royal Mint, London on 20 June 1899, The Perth Mint was established as a Statutory Authority on 1 July 1970.

*Photo Index*





The following table shows the principal products of manufacturing activity in the State. Owing to the confidentiality provisions of the *Census and Statistics Act 1905*, data for some important commodities including petroleum products, alumina, refined nickel, pig iron, beer and superphosphate are not available for publication.

### PRODUCTION, SALES AND TRANSFERS OUT OF SELECTED COMMODITIES

(Manufacturing establishments of multi-establishment enterprises, and single establishment manufacturing enterprises employing four or more persons.)

Commodity	Unit	1977-78			1978-79		
		Production	Sales and transfers out		Production	Sales and transfers out	
		Quantity	Quantity	Value	Quantity	Quantity	Value
				\$'000			\$'000
Aerated waters, canned and bottled	'000 litres	94,234	93,401	31,697	97,662	101,715	37,700
Automotive batteries (new and rebuilt) —							
6 volt	number	4,948	4,910	142	7,284	7,253	216
12 volt	number	14,752	14,646	566	22,011	21,843	869
Bacon and ham, not canned	tonne	5,666	5,699	20,440	5,516	5,453	22,033
Blocks, concrete (a), in terms of 400mm x 200mm x 200mm blocks	'000	5,220	5,230	6,082	5,472	5,411	6,293
Boats and ships, total amount received during the year —							
On vessels 5 tonnes gross and less than 50 tonnes	..	(b)	(b)	5,075	(b)	(b)	8,253
On vessels 50 tonnes gross and over	..	(b)	(b)	4,947	(b)	(b)	6,164
Boats, small (less than 5 tonnes) —							
Fibreglass	number	n.p.	1,905	6,691	1,516	1,573	5,479
Aluminium	number	n.p.	1,101	1,145	n.p.	n.p.	n.p.
Boots, shoes, sandals and slippers (c)	pair	319,223	317,207	3,929	352,883	315,289	4,526
Bread, total value	..	..	..	35,210	..	..	40,613
Bricks, clay (all sizes)	'000	357,391	339,170	40,202	381,092	362,615	48,301
Butter (d)	tonne	2,212	n.p.	n.p.	1,373	n.p.	n.p.
Cheese (d)	tonne	1,812	n.p.	n.p.	2,364	n.p.	n.p.
Constructional steel, fabricated	tonne	65,524	67,228	63,521	69,623	67,275	75,837
Containers, bags and packets —							
Of paperboard	..	(b)	(b)	17,002	(b)	(b)	18,831
Of paper	..	(b)	(b)	6,179	(b)	(b)	7,355
Cordials and syrups	'000 litres	7,589	7,343	3,711	n.p.	n.p.	n.p.
Furniture —							
Metal or partly metal	..	(b)	(b)	14,914	(b)	(b)	16,449
Wooden (e)	..	(b)	(b)	43,277	(b)	(b)	45,609
Other (excluding seagrass, wicker or cane)	..	(b)	(b)	1,083	(b)	(b)	555
Hoists, cranes and lifting machinery (f)	..	(b)	(b)	8,617	(b)	(b)	9,513
Ice cream (g)	'000 litres	19,815	19,633	10,465	19,329	19,280	9,025
Jewellery and silverware	..	(b)	(b)	1,911	(b)	(b)	4,160
Mattresses, other than inner spring	number	43,042	43,008	593	43,118	43,024	593
Meat, fresh (for human consumption) —							
Carcases, whole or butchered	..	(b)	(b)	71,152	(b)	(b)	88,174
Boned	..	(b)	(b)	89,878	(b)	(b)	113,856
Metal window frames, aluminium	..	(b)	(b)	19,243	(b)	(b)	18,261
Mining and drilling machinery and parts	..	(b)	(b)	12,146	(b)	(b)	20,277
Offal, bones, etc. —							
Edible (heart, liver, brains, etc.)	..	(b)	(b)	6,237	(b)	(b)	7,204
Inedible (welts, horns, hides, etc.)	..	(b)	(b)	12,705	(b)	(b)	17,247
Paints, enamels and clears (h)	'000 litres	5,727	5,754	11,386	6,372	6,340	13,580
Plaster sheets, non-acoustic	'000 sq m	3,496	3,538	6,229	n.p.	3,247	5,650
Prefabricated steel garages, carports and sheds, etc.	..	(b)	(b)	14,255	(b)	(b)	18,056
Ready-mixed concrete	'000 cu m	1,051	1,051	50,003	1,025	1,025	47,018
Roofing tiles — number	'000	34,121	32,693	17,502	33,260	32,956	18,313
area	'000 sq m	3,046	(i)	(i)	2,784	(i)	(i)
Signs and advertising displays (excl. neon)	..	(b)	(b)	2,902	(b)	(b)	3,666
Small goods	..	(b)	(b)	16,554	(b)	(b)	19,290
Solar absorber units for hot water systems (effective area)	sq m	55,506	55,486	9,344	91,903	88,721	11,018
Stock and poultry foods —							
Meat and bone meal	tonne	41,338	40,987	7,955	38,631	40,682	8,312
Other prepared stock and poultry food (j)	tonne	172,928	178,533	28,323	185,167	189,097	31,555
Tallow, rendered — edible	tonne	1,502	1,414	754	2,375	2,460	1,308
inedible	tonne	29,882	29,741	9,761	28,845	29,028	11,874



**PRODUCTION, SALES AND TRANSFERS OUT OF SELECTED COMMODITIES — *continued***  
 (Manufacturing establishments of multi-establishment enterprises, and single establishment manufacturing enterprises employing four or more persons.)

Commodity	Unit	1977-78			1978-79		
		Production	Sales and transfers out		Production	Sales and transfers out	
		Quantity	Quantity	Value	Quantity	Quantity	Value
				\$'000			\$'000
Timber —							
Undressed (k) —							
Sleepers	cu m	55,706	52,850	6,362	56,624	52,526	7,017
All other (excl. palings) obtained from logs sawn in the mill	cu m	287,119	262,665	35,369	279,436	271,751	37,558
Kiln dried	cu m	30,819	(i)	(i)	20,615	(i)	(i)
Wool, scoured (from greasy, shorn wool)	tonne	13,308	—	—	16,129	—	—
Woven or linked wire fabric (l)	..	(b)	(b)	4,006	(b)	(b)	n.p.

(a) Basic building and paving blocks for walks, partitions, foundations, flooring, paths, etc. and decorative blocks, lintels and sill blocks. Excludes architectural screen and similar fancy blocks. (b) Only value of sales and transfers out is collected. (c) Excludes footwear solely of rubber. (d) Source — production only: Department of Agriculture. (e) Includes prefabricated wooden furniture but excludes in-built furniture. (f) Includes electric hoists. Excludes hydraulic hoists for trucks. (g) Includes ice cream combined with other confections including those aerated, milk-based confections which contain 10 per cent or more butterfat. (h) Includes architectural, decorative and industrial paints. Excludes water paints in powder form. (i) Only quantity produced is collected. (j) Includes poultry pellets, crumbles and mash. Excludes cereal grain and oilseed cakes and meals. (k) Includes preserved timber. (l) Steel and non-ferrous (including chain, wire, link mesh, fencing wire, crimped fabric and fine wire mesh).

### ELECTRICITY AND GAS PRODUCTION AND DISTRIBUTION IN WESTERN AUSTRALIA

On 1 July 1975 the Government of Western Australia combined the State Electricity Commission and the Fuel and Power Commission to form a new organisation known as The State Energy Commission of Western Australia under the provisions of the *Acts Amendment (State Energy Commission) Act 1975*. The new Commission is specifically charged with the responsibility for ensuring the effective and efficient utilisation of this State's energy resources and for providing its people with economical and reliable supplies of electricity and gas.

Prior to the formation of the State Energy Commission the production and distribution of electricity and gas was the sole responsibility of The State Electricity Commission of Western Australia, established in 1946.

#### Electricity

Before the establishment of the State Electricity Commission, electricity was generated and distributed by a large number of independent authorities operating numerous power stations, while a government-owned steam power station at East Perth supplied much of what was then the metropolitan area. Small units, of similar type but privately owned, operated in the major mining centres of Collie and Kalgoorlie. With other minor exceptions, all country areas were dependent on internal combustion equipment from which the local operating authorities supplied either alternating or direct current at various voltages.

Since 1946 numerous districts and towns have been connected to the Commission's grid system and many small independent power stations from which supply was previously drawn have been closed. The Commission also owns and operates diesel power stations at Esperance, Fitzroy Crossing, Halls Creek, Kondinin, Kununurra, Onslow, Port Hedland and Roebourne. Small systems too remote to be connected to the grid system or supplied from the Commission-owned diesel stations, and still controlled by local government authorities, are being absorbed in a leasing arrangement whereby the local distribution system and generating plant is operated by the Commission under an arrangement known as the Country Towns' Assistance Scheme. Under the scheme the Commission undertakes to operate, maintain, replace or upgrade plant and supply equipment as necessary. The benefits of the scheme, which include bulk purchase of fuel and lubricants, rationalisation of spare parts requirements for generation and distribution, centralised billing and administration, the availability of plant from the

Commission's pool and the Commission's technical expertise, have enabled tariffs in country areas to be reduced so that the price of all metered units of electricity throughout the State is now uniform. At the present time there are twenty-nine country towns supplied under the provisions of the Country Towns' Assistance Scheme.

The Commission supplies most of the electricity sold throughout Western Australia and all electricity sold in the metropolitan area. In addition, significant amounts are generated by large mining and minerals processing enterprises for their own use. At 30 June 1981 the Commission was operating coal-burning power stations at East Perth (55 MW), South Fremantle (100 MW), Bunbury (120 MW), Muja (640 MW), and a coal-burning and oil-burning power station at Kwinana capable of producing 900 MW from four oil-burning units (4 x 120 MW), two dual coal-burning and oil-burning units (each capable of 120 MW when burning coal and 200 MW when burning oil) and a 20 MW gas turbine. A small hydro-electric station of 2 MW capacity is situated near Collie at Wellington Dam, and at Geraldton in the mid-west a 20 MW gas turbine is also connected into the grid system.

The main interconnections with the grid system are two 330,000 volt transmission lines from the Kwinana Power Station, two 132,000 volt transmission lines from the Bunbury Power Station and two 132,000 volt transmission lines from the Muja Power Station. An additional 132,000 volt line connects the Muja and Bunbury Power Stations. Construction has commenced on the first of two 330,000 volt transmission lines to connect the Muja Power Station additions with the metropolitan area. Transmission lines of 132,000 volt or 66,000 volt connect major outlying centres such as Merredin, Geraldton and Albany to the grid system.

In December 1959, an amendment to the then State Electricity Commission Act was passed to enable consumers to contribute towards the extension of mains beyond the distance which can be supplied economically by the Commission. At 30 June 1980 approximately 19,793 consumers had been connected in country and metropolitan areas under the Contributory Extension Scheme. At the same date there was a total of 425,456 electricity consumers served by the Commission.

## Gas

Town gas production in Western Australia ceased in December 1972 with the conversion of town gas appliances to burn natural gas from the gasfields in the region of Dongara, south of Geraldton. These natural gasfields are relatively small but are estimated to have sufficient reserves to supply the domestic market and a limited industrial market until the mid 1980s. By then, however, gas supplies from the North West Shelf are expected to be available (see Part 2 of this Chapter).

The State Energy Commission supplies natural gas to much of the metropolitan area and to the towns of Pinjarra and North Pinjarra some eighty-five kilometres to the south of the capital. In the Commission's supply area the total length of mains installed for the distribution of natural gas was 4,228 kilometres and the maximum daily output was 18.72 million MJ in the year ended 30 June 1980. At the same date there were 94,424 natural gas consumers served by the Commission.

Simulated natural gas is produced and supplied in the Bunbury area and tempered liquid petroleum gas is supplied to the Albany area by the State Energy Commission. The Fremantle Gas and Coke Company Limited, a private gas supply company, supplies natural gas to customers within its franchise area which extends eight kilometres from the centre of Fremantle.

The State Energy Commission maintains an advisory service to assist its customers in such things as the selection and economical operation of both gas and electric appliances.

## ELECTRICITY AND GAS STATISTICS

The electricity and gas industries, which are not included with manufacturing in the Australian Standard Industrial Classification, are the subject of a separate census which is conducted periodically. The results of the Census of Electricity and Gas Establishments for the year ended 30 June 1978 appear in the table below.

## ELECTRICITY AND GAS ESTABLISHMENTS — SUMMARY OF OPERATIONS: 1977-78

Number of establishments operating at 30 June	Persons employed (average over whole year) (a)			Wages and salaries	Turnover	Stocks		Purchases, transfers in and selected expenses	Value added
	Males	Females	Total			Opening	Closing		
				\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
13	5,232	392	5,624	68,933	259,546	21,271	22,402	100,071	160,606

(a) Includes working proprietors.

Production of electricity and gas in Western Australia over the six years ended 1979-80 is shown in the following table. Electricity generated by Government establishments has increased steadily over the period from 3,570 to 5,231 million kilowatt hours.

## PRODUCTION OF ELECTRICITY AND GAS

Item	Unit	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Electricity generated — Government	million kWh	3,570	3,904	4,240	4,556	4,815	5,231
Gas available for issue through mains	million MJ	30,699	31,261	31,767	30,426	31,259	32,280

## CHAPTER IX — TRADE, TRANSPORT AND COMMUNICATION

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## CHAPTER IX — TRADE, TRANSPORT AND COMMUNICATION

### Part 1 — External Trade

Overseas trade statistics are compiled from information contained in documents prepared by importers and exporters or their agents in accordance with the Customs Act. Particulars of Western Australia's overseas trade, as presented in this Part, have been derived from data supplied by the Australian Bureau of Statistics, Canberra.

Statistics of Western Australia's trade with other Australian States are compiled by the Western Australian Office from information contained in documents collected under authority of the *Census and Statistics Act* 1905 from importers, exporters and other persons concerned with the distribution of goods.

#### Classification of Commodities

Overseas imports and exports are classified according to the Australian Import and Export Commodity Classifications of some 6,600 import items and 2,500 export items. These classifications are based on the *United Nations Standard International Trade Classification, Revision 2*, which is closely related to the Customs Co-operation Council Nomenclature (previously known as the Brussels Tariff Nomenclature) used in the Australian Customs Tariff. The Standard International Trade Classification consists of 10 broad commodity categories designated 'Sections' and comprising 62 commodity 'Divisions' which are further divided into 233 commodity 'Groups'. The structure of the classification serves to provide a summary of data relating to 1,826 basic items of international trade. Because of changes to the Classifications, figures for periods prior to 1 July 1978 may not be strictly comparable with those for later periods.

Interstate imports and exports are classified according to Interstate Trade Commodity Classifications which are based on the Australian Commodity Classifications. The basic items of the Australian classifications are compressed or expanded according to their significance in Western Australia's trade. The Interstate Trade Commodity Classifications comprise some 506 items of import and 217 items of export within the structure of commodity Sections, Divisions and Groups of the Standard International Trade Classification.

#### Valuation of Items of Trade

All values in overseas trade statistics are determined on a 'free on board (f.o.b.) port of shipment' basis. This means that all charges (in particular the cost of freight and insurance) incurred after the goods have been exported from the port of shipment are excluded. Only transport and service charges incurred, or usually incurred, prior to export are included in the determination of trade values.

The procedure adopted to value overseas imports and exports is as follows:

*Imports.* Up to 30 June 1976 the recorded value of goods imported was the 'value for duty' as laid down for Customs purposes i.e. the sum of:

- (a) (i) the actual money price paid or to be paid for the goods by the Australian importer plus any special deduction, or
- (ii) the current domestic value of the goods, whichever was the higher; and
- (b) all charges payable or ordinarily payable for placing the goods free on board at the port of export.

In the case of goods consigned for sale in Australia the value for duty was the amount which would be the value for duty if the goods were, at the date of exportation, sold to an Australian importer instead of being consigned for sale in Australia.

'Current domestic value' was defined as 'the amount for which the seller of the goods to the purchaser in Australia was selling or would be prepared to sell for cash, at the date of exportation of those goods, the same quantity of identically similar goods to any and every purchaser in the country of export for consumption in that country'.

From 1 July 1976 a system of valuation based on the Brussels Definition of Value was introduced, the value for duty being based on the normal price, i.e. the price the goods would fetch at the time when the duty becomes payable on a sale in the open market between a buyer and a seller independent of each other. The goods are valued in the country of exportation, that is freight and insurance are excluded.

*Exports.* The recorded value of goods exported includes the cost of the outside packages and is determined as follows.

- (a) Goods sold to overseas buyers before export are valued at the Australian f.o.b. port of shipment equivalent of the actual price at which the goods were sold.
- (b) Goods shipped on consignment are valued at the Australian f.o.b. port of shipment equivalent of the price paid for similar goods of Australian origin in the principal markets of the country to which they are dispatched for sale.

The basis of valuation for exports to other Australian States is f.o.b., or its equivalent, at the point of final shipment. Statistics of imports from other Australian States are recorded in terms of landed cost.

### Direction of Trade

The term *Country of Origin*, as used in recording the statistics of overseas trade, means the country of production; *Country of Destination* means the country to which goods were consigned at the time of export. In compiling statistics of Western Australia's interstate imports and exports, goods are classified according to the State or Territory from which or to which they were consigned.

### Summary of Trade

Statistics of Western Australia's external trade are presented in the following series of tables. Particulars relate, in all cases, to the year ended 30 June. The figures shown for exports do not include ships' stores, details of which are given in a table near the end of this Part.

VALUE OF INTERSTATE AND OVERSEAS TRADE OF WESTERN AUSTRALIA  
(\$'000)

Direction of trade	1974-75	1975-76	1976-77	1977-78	1978-79 r	1979-80
INTERSTATE (a) —						
Imports	1,134,510	1,418,726	1,641,545	1,828,510	2,044,447	2,337,808
Exports	253,424	290,733	305,836	355,151	446,208	635,388
Excess of —						
Imports over exports	881,086	1,127,993	1,335,709	1,473,360	1,598,238	1,702,420
OVERSEAS —						
Imports	577,416	637,439	829,411	937,350	1,161,164	1,449,683
Exports	1,880,082	2,117,898	2,596,107	2,588,954	2,820,134	3,854,092
Excess of —						
Exports over imports	1,302,666	1,480,460	1,766,697	1,651,605	1,658,970	2,404,409
TOTAL (a) —						
Imports	1,711,926	2,056,165	2,470,955	2,765,860	3,205,611	3,787,491
Exports	2,133,506	2,408,631	2,901,943	2,944,105	3,266,343	4,489,480
Excess of —						
Exports over imports	421,580	352,466	430,987	178,245	60,732	701,989

(a) From 1975-76, excludes interstate value of horses.

Details are not available for publication.

## IMPORTS AND EXPORTS

VALUE OF IMPORTS INTO AND EXPORTS FROM WESTERN AUSTRALIA  
CLASSIFIED ACCORDING TO ORIGIN OR DESTINATION  
(\$'000)

Origin or destination	Imports			Exports		
	1977-78	1978-79	1979-80	1977-78	1978-79	1979-80
<b>INTERSTATE (a) —</b>						
New South Wales (b)	737,301	838,141	909,066	150,003	194,016	281,438
Victoria	808,449	858,776	1,037,935	112,869	123,803	168,894
Queensland	54,177	73,419	86,975	18,298	24,680	42,490
South Australia	205,328	238,841	262,613	50,484	80,796	109,948
Tasmania	19,534	28,719	34,244	2,577	4,173	5,336
Northern Territory	3,722	6,550	6,974	20,920	18,740	27,281
Total, Interstate	1,828,510	2,044,447	2,337,808	355,151	446,208	635,388
<b>OVERSEAS —</b>						
Argentina	169	146	160	15,107	38,595	70,502
Bahrain	19,445	21,370	30,654	26,207	29,360	37,234
Bangladesh	574	584	1,865	12,255	3,122	10,146
Belgium-Luxembourg	9,061	8,276	3,987	15,219	20,613	13,413
Burma, Socialist Republic of the Union of	14	78	16	167	10	3,607
Canada	26,105	72,885	30,024	29,879	24,978	27,061
China — excluding Taiwan Province	2,539	2,856	9,991	175,954	186,279	242,912
— Taiwan Province only	13,077	11,606	16,338	39,866	56,841	62,568
Christmas Island	4,568	4,668	6,030	4,141	3,433	3,308
Egypt, Arab Republic of	—	15	9	36,746	16,255	34,816
Fiji	—	—	3	10,927	8,470	8,799
Finland	2,122	3,726	3,471	90	178	791
France	14,268	13,326	27,366	47,523	45,811	51,977
German Democratic Republic	114	150	358	733	1,019	5,817
Germany, Federal Republic of	46,197	73,441	58,795	87,811	105,320	134,314
Ghana	—	—	4	574	—	4,771
Hong Kong	8,319	9,416	11,610	41,953	60,086	21,329
India	4,671	4,739	5,667	9,735	10,240	12,876
Indonesia	6,195	26,779	106,190	43,424	58,307	78,590
Iran	48,400	11,593	15,459	38,785	17,837	132,725
Iraq	81,201	94,525	129,828	9,468	3,834	41,410
Italy	19,937	20,558	19,533	40,753	52,916	63,767
Japan	126,110	124,171	173,737	1,109,269	1,118,298	1,391,727
Korea, Republic of	2,389	3,358	4,491	30,857	49,486	80,604
Kuwait	101,667	89,597	192,743	18,517	21,302	25,993
Libyan Jamahiriya	—	—	—	1,932	4,614	17,792
Malaysia	10,843	7,954	10,688	44,815	51,648	49,486
Mauritius	36	1	3	6,175	8,630	4,155
Mexico	73	187	112	1,547	3,736	5,500
Nauru, Republic of	13,269	14,350	17,273	10	12	7
Netherlands	3,639	11,912	8,744	46,751	42,517	77,434
New Zealand	4,903	9,970	16,429	31,416	30,834	48,868
Norway	2,341	2,066	2,587	20,061	10,341	15,066
Pakistan, Islamic Republic of	284	472	1,293	20,169	30,857	24,227
Papua New Guinea	909	1,090	1,342	3,571	4,163	2,892
Philippines, Republic of	2,058	2,126	3,213	4,055	12,331	16,214
Poland	306	396	1,144	7,423	9,272	15,251
Qatar	14,936	1,197	—	1,709	4,498	6,216
Saudi Arabia	2,337	11,281	13,466	13,330	23,207	33,240
Singapore, Republic of	79,510	64,604	93,965	55,923	41,185	65,636
South Africa, Republic of	5,355	23,886	14,007	18,925	19,667	29,083
Spain	3,031	3,692	3,364	8,560	11,125	7,781
Sweden	8,334	6,463	6,713	3,826	11,058	11,462
Switzerland	8,928	6,826	2,720	802	550	1,725
Thailand	3,712	2,818	6,474	1,717	6,389	9,469
Union of Soviet Socialist Republics	190	114	53	43,231	67,161	136,551
United Arab Emirates	24,968	61,905	117,195	4,661	6,357	22,217
United Kingdom	75,443	81,237	77,986	45,567	49,466	83,887
United States of America	118,922	217,672	182,805	284,060	374,162	515,681
Yemen Arab Republic	—	—	—	25,918	10,700	39,183
Yugoslavia	389	383	299	5,498	2,010	7,522
Zambia	31	6	—	2,184	2,179	4,678
Total, Overseas (c)	937,350	1,161,164	1,449,683	2,588,954	2,820,134	3,854,092
<b>GRAND TOTAL (a)(c)</b>	<b>2,765,860</b>	<b>3,205,611</b>	<b>3,787,491</b>	<b>2,944,105</b>	<b>3,266,343</b>	<b>4,489,480</b>

(a) Excludes interstate value of horses. Details are not available for publication. (b) Includes the value of trade with the Australian Capital Territory. (c) Includes figures for 'Other countries' and 'Other' (Origin not known, Destination unknown, etc.).

VALUE OF TRADE OF WESTERN AUSTRALIA  
SELECTED DIVISIONS: 1979-80  
(\$'000)

Division	Description	Imports			Exports		
		Interstate	Overseas	Total	Interstate	Overseas	Total
00	Live animals, chiefly for food	(a)7,948	489	(a) 8,437	(a) 591	93,560	(a) 94,151
01	Meat and meat preparations	16,230	404	16,634	2,677	157,700	160,377
03	Fish, crustaceans and molluscs, and preparations thereof	4,531	11,247	15,777	10,558	90,444	101,002
04	Cereals and cereal preparations	23,802	1,076	24,878	1,143	699,353	700,496
05	Vegetables and fruit	51,995	5,543	57,538	2,923	15,921	18,844
07	Coffee, tea, cocoa, spices, and manufactures thereof	34,341	751	35,092	n.p.	75	(b)
09	Miscellaneous edible products and preparations	31,825	952	32,777	685	438	1,124
11	Beverages	40,603	4,115	44,719	3,656	335	4,032
12	Tobacco and tobacco manufactures	29,210	980	30,190		43	
21	Hides, skins and furskins, raw	n.p.	53	(b)		34,716	(b)
26	Textile fibres (other than wool tops) and their wastes (not manufactured into yarn or fabric)	n.p.	2,515	(b)	n.p.	379,255	(b)
27	Crude fertilisers and crude minerals (excluding coal, petroleum and precious stones)	1,108	42,913	44,021	1,154	48,360	49,513
28	Metalliferous ores and metal scrap	n.p.	1,295	(b)	09,317	1,122,904	1,232,221
32	Coal, coke and briquettes	126,359	582	820,147	n.p.	128	(b)
33	Petroleum, petroleum products and related materials		693,191		n.p.	77,171	(b)
34	Gas, natural and manufactured		15		n.p.	n.p.	(b)
52	Inorganic chemicals	12,052	8,094	20,146	14,341	17,652	31,992
54	Medicinal and pharmaceutical products	48,168	503	48,671	n.p.	77	(b)
55	Essential oils and perfume materials; toilet, polishing and cleansing preparations	56,018	1,553	57,571	765	134	898
58	Artificial resins and plastic materials, and cellulose esters and ethers	36,086	9,797	45,882	n.p.	148	(b)
59	Chemical materials and products, n.e.s.	39,924	8,830	48,754	12,248	1,582	13,830
62	Rubber manufactures, n.e.s.	42,685	20,510	63,195	189	54	244
64	Paper, paperboard, and articles of paper pulp, of paper or of paperboard	52,743	19,795	72,538	6,014	1,067	7,081
65	Textile yarn, fabrics, made-up articles, n.e.s. and related products	76,464	30,685	107,149	n.p.	556	(b)
66	Non-metallic mineral manufactures, n.e.s.	29,969	18,772	48,741	12,135	4,098	16,234
67	Iron and steel	177,470	27,575	205,045	15,230	68,195	83,426
68	Non-ferrous metals	44,718	4,573	49,291	n.p.	2,381	(b)
69	Manufactures of metal, n.e.s.	107,199	18,587	125,786	48,356	5,896	54,253
71	Power generating machinery and equipment	26,199	36,536	62,735	4,395	1,069	5,464
72	Machinery specialised for particular industries	99,557	78,707	178,265	46,946	8,403	55,349
74	General industrial machinery and equipment, n.e.s. and machinery parts, n.e.s.	103,187	47,116	150,303	17,417	1,312	18,729
75	Office machines and automatic data processing equipment	36,553	4,938	41,491	1,357	377	1,734
76	Telecommunications and sound recording and reproducing apparatus and equipment	50,107	13,081	63,187	1,243	1,168	2,411
77	Electrical machinery, apparatus and appliances, n.e.s. and electrical parts thereof	126,184	22,442	148,626	9,950	442	10,391
78	Road vehicles (including air cushion vehicles)	317,632	85,016	402,648	n.p.	1,139	(b)
79	Other transport equipment	20,273	58,572	78,845	19,712	30,079	49,791
84	Articles of apparel and clothing accessories	134,614	5,893	140,507	16,518	254	16,772
87	Professional, scientific and controlling instruments and apparatus, n.e.s.	24,482	13,195	37,677	542	1,142	1,684
TOTAL (c)		2,337,808	1,449,683	3,787,491	635,388	3,854,092	4,489,480
		(a)		(a)	(a)		(a)

(a) Excludes interstate value of horses. Details are not available for publication. (b) Owing to the exclusion of confidential details, a total value is not available. (c) Includes details not available for publication and divisions not shown separately.



VALUE OF OVERSEAS TRADE WITH SELECTED COUNTRIES BY  
SELECTED DIVISIONS: 1979-80  
(\$'000)

Division	Description	Imports				Exports			
		United States of America	Japan	United Kingdom	Germany, Federal Republic of	Japan	United States of America	Germany, Federal Republic of	United Kingdom
01	Meat and meat preparations	—	—	271	1	13,972	63,088	468	2,683
03	Fish, crustaceans and molluscs, and preparations thereof	451	2,129	626	95	30,624	54,000	—	171
04	Cereals and cereal preparations	62	42	320	80	124,776	—	3,869	227
05	Vegetables and fruit	601	72	241	48	26	—	819	1,454
08	Feeding stuff for animals (excluding unmilled cereals)	2,005	8	7	15	860	—	—	—
11	Beverages	113	31	2,210	253	—	52	—	1
21	Hides, skins and furskins, raw	—	—	—	—	1,823	48	1,975	307
24	Cork and wood	518	1	1	—	—	205	129	2,965
26	Textile fibres (other than wool tops) and their wastes (not manufactured into yarn or fabric)	240	77	837	—	128,684	10,057	41,246	8,959
27	Crude fertilisers and crude minerals (excluding coal, petroleum and precious stones)	5,639	373	299	36	35,294	330	—	429
28	Metalliferous ores and metal scrap	1	39	62	509	785,789	36,543	69,358	15,613
29	Crude animal and vegetable materials, n.e.s.	95	224	152	7	560	411	480	552
51	Organic chemicals	5,271	1,559	6,801	3,684	—	1	—	—
52	Inorganic chemicals	246	278	659	891	545	6,347	—	171
56	Fertilisers, manufactured	7,655	25	—	228	—	19	—	—
58	Artificial resins and plastic materials and cellulose esters and ethers	1,956	1,216	2,619	504	—	—	—	36
59	Chemical materials and products, n.e.s.	3,654	390	2,462	311	236	1,220	—	—
62	Rubber manufactures, n.e.s.	2,003	12,098	2,080	795	2	—	6	8
64	Paper, paperboard, and articles of paper pulp, of paper or of paperboard	695	1,563	702	1,000	32	—	—	—
65	Textile yarn, fabrics, made-up articles, n.e.s. and related products	2,592	2,273	2,418	344	1	6	6	3
66	Non-metallic mineral manufactures, n.e.s.	1,352	5,037	2,072	1,201	987	140	102	100
67	Iron and steel	4,241	13,723	1,362	1,189	4,802	3,978	531	606
68	Non-ferrous metals	370	73	311	99	48	15	5	2,236
69	Manufactures of metal, n.e.s.	6,254	2,022	2,244	1,906	240	1,456	9	77
71	Power generating machinery and equipment	11,716	2,893	9,801	3,880	4	104	19	48
72	Machinery specialised for particular industries	46,504	5,569	6,836	7,737	4	1,850	7	721
73	Metalworking machinery	575	765	605	413	—	6	1	19
74	General industrial machinery and equipment, n.e.s. and machine parts, n.e.s.	22,115	6,879	4,977	3,994	13	30	28	54
75	Office machines and automatic data processing equipment	2,584	381	1,535	19	—	26	65	60
76	Telecommunications and sound recording and reproducing apparatus and equipment	1,941	7,434	655	45	4	69	3	6
77	Electrical machinery, apparatus and appliances, n.e.s. and electrical parts	5,107	5,428	2,377	2,347	1	18	—	21
78	Road vehicles (including air cushion vehicles)	13,405	53,614	3,854	10,040	2	53	28	15
79	Other transport equipment	3,010	37,486	649	4,932	9,321	444	6	251
87	Professional, scientific and controlling instruments and apparatus, n.e.s.	5,424	1,499	1,584	1,554	—	198	16	145
88	Photographic apparatus, equipment and supplies and optical goods, n.e.s.; watches and clocks	670	391	246	372	—	11	—	6
TOTAL (a)		182,805	173,737	77,986	58,795	1,391,726	515,681	134,314	83,887

(a) Includes details not available for publication and divisions not shown separately.

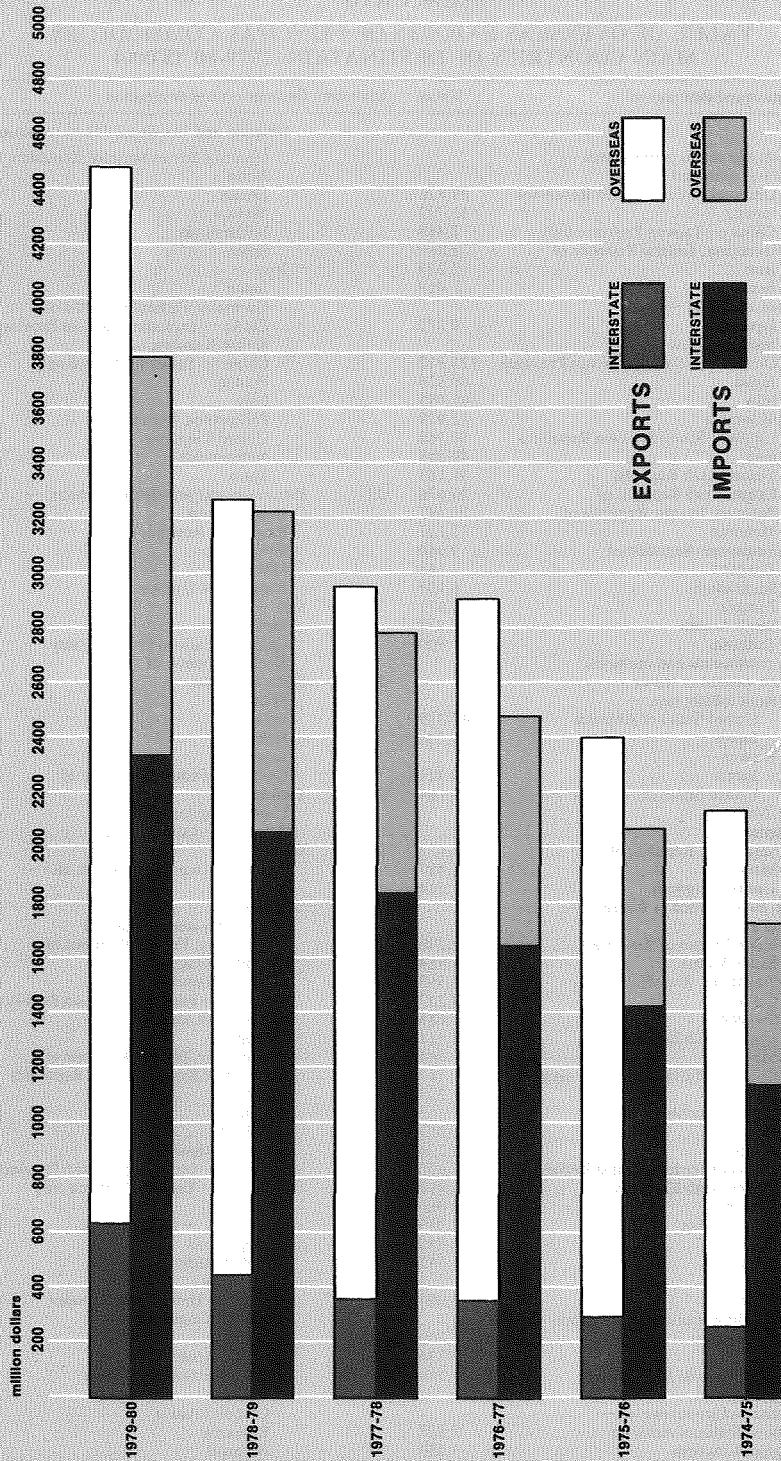
In the table below, details are given of the value of the principal commodities imported from and exported to other Australian States and Territories.

VALUE OF INTERSTATE IMPORTS AND EXPORTS — SELECTED DIVISIONS  
(\$'000)

Division	Description	Imports			Exports		
		1977-78	1978-79	1979-80	1977-78	1978-79	1979-80
01	Meat and meat preparations	12,201	15,259	16,230	8,375	1,440	2,677
02	Dairy products and birds' eggs	20,132	21,618	24,764	n.p.	n.p.	n.p.
03	Fish, crustaceans and molluscs, and preparations thereof	3,720	3,365	4,531	7,641	7,252	10,558
04	Cereal grains and cereal preparations	20,273	21,832	23,802	540	789	1,143
05	Vegetables and fruit	37,061	43,015	51,995	2,055	2,818	2,923
06	Sugar, sugar preparations and honey	17,110	23,391	24,451	n.p.	n.p.	n.p.
07	Coffee, tea, cocoa, spices and manufactures thereof	29,151	33,541	34,341	n.p.	n.p.	n.p.
08	Feeding stuff for animals (excluding unmilled cereals)	13,209	14,773	15,663	n.p.	n.p.	n.p.
09	Miscellaneous edible products and preparations	21,986	24,939	31,825	2,006	611	685
11	Beverages	27,018	33,829	40,603	3,113	3,835	3,656
12	Tobacco and tobacco manufactures	23,964	31,870	29,210			
28	Metalliferous ores and metal scrap	n.p.	n.p.	n.p.	69,627	76,820	109,317
32	Coal, coke and briquettes						
33	Petroleum, petroleum products and related materials	86,219	78,743	126,359	n.p.	n.p.	n.p.
34	Gas, natural and manufactured						
53	Dyeing, tanning and colouring materials	11,872	12,083	13,963	850	843	793
54	Medicinal and pharmaceutical products	39,994	42,590	48,168	n.p.	n.p.	n.p.
55	Essential oils and perfume materials; toilet, polishing and cleansing preparations	43,225	47,740	56,018	590	550	765
58	Artificial resins and plastic materials, and cellulose esters and ethers	26,081	30,429	36,086	n.p.	n.p.	n.p.
59	Chemical materials and products, n.e.s.	24,738	32,133	39,924	3,126	6,237	12,248
62	Rubber manufactures, n.e.s.	35,252	38,463	42,685	230	191	189
64	Paper, paperboard, and articles of paper pulp, of paper or of paperboard	39,399	46,976	52,743	4,472	5,207	6,014
65	Textile yarn, fabrics, made-up articles n.e.s. and related products	60,852	66,823	76,464	n.p.	n.p.	n.p.
66	Non-metallic mineral manufactures, n.e.s.	24,814	26,148	29,969	9,279	13,387	12,135
67	Iron and steel	109,423	126,782	177,470	12,937	11,791	15,230
68	Non-ferrous metals	25,253	29,048	44,718	n.p.	n.p.	n.p.
69	Manufactures of metal, n.e.s.	84,059	93,591	107,199	21,693	34,501	48,356
71	Power generating machinery and equipment	28,047	28,064	26,199	3,896	3,630	4,395
72	Machinery specialised for particular industries	62,302	70,544	99,557	35,614	46,226	46,946
74	General industrial machinery and equipment, n.e.s. and machine parts, n.e.s.	74,949	87,425	103,187	12,470	12,069	17,417
75	Office machines and automatic data processing equipment	34,644	32,361	36,553	3,575	1,995	1,357
76	Telecommunications and sound recording and reproducing apparatus and equipment	58,321	58,082	50,107	1,640	1,125	1,243
77	Electrical machinery, apparatus and appliances, n.e.s. and electrical parts thereof	104,467	107,144	126,184	3,476	2,830	9,950
78	Road vehicles (including air cushion vehicles)	268,716	324,651	317,632	n.p.	n.p.	n.p.
79	Other transport equipment	22,154	18,219	20,273	8,265	7,675	19,712
82	Furniture and parts thereof	10,999	12,055	11,811	11,378	11,781	13,822
84	Articles of apparel and clothing accessories	115,159	126,777	134,614	6,595	9,824	16,518
85	Footwear	19,533	24,122	24,323	1,162	2,396	2,867
87	Professional, scientific and controlling instruments and apparatus, n.e.s.	22,072	22,834	24,482	295	480	542
88	Photographic apparatus, equipment and supplies and optical goods, n.e.s.; watches and clocks	18,026	19,334	21,185	177	191	140
TOTAL (a)		1,828,510	2,044,447	2,337,808	355,151	446,208	635,388

(a) Includes divisions not shown separately. Excludes the value of horses; details are not available for publication.

## Imports and Exports, 1974-75 to 1979-80



## EXPORTS

VALUE OF OVERSEAS EXPORTS OF PRINCIPAL COMMODITIES  
MAIN COUNTRIES OF DESTINATION: 1979-80 (\$'000)

Division	Description and destination	Value	Division	Description and destination	Value
	Food —			Ilmenite and leucoxene (b) — (continued) —	
04	Cereals and cereal preparations —			Union of Soviet Socialist Republics	3,112
	Barley, unmilled —			Japan	1,550
	Union of Soviet Socialist Republics	28,826		France	1,397
	Japan	16,727		Mexico	1,350
	China — Taiwan Province only	7,488		Netherlands	1,266
	Germany, Federal Republic of	3,869		Spain	1,229
	Iran	2,224		Iron —	
	Brazil	1,419		Japan	770,420
	Oats, unmilled —			Germany, Federal Republic of	67,310
	Japan	9,372		China — excluding Taiwan Province	51,146
	Wheat, unmilled —			Korea, Republic of	50,846
	China — excluding Taiwan Province	123,312		China — Taiwan Province only	24,314
	Japan	90,526		France	14,819
	Iran	89,495		Italy	12,815
	Indonesia	72,979		Philippines, Republic of	11,990
	Union of Soviet Socialist Republics	50,360		United Kingdom	9,865
	Iraq	40,288		Netherlands	5,882
	Yemen Arab Republic	39,183		Spain	2,862
	Egypt, Arab Republic of	30,476	33	Petroleum and petroleum products —	
	Pakistan, Islamic Republic of	23,381		New Zealand	45,053
	Malaysia	22,127		Singapore, Republic of	11,718
	Singapore, Republic of	9,960		Fiji	8,483
	Thailand	7,168		Malaysia	4,095
	Bangladesh	6,139		Papua-New Guinea	2,294
	Zambia	4,671	27	Salt —	
	Saudi Arabia	3,978		Japan	28,850
	Tanzania	1,900		China — Taiwan Province only	4,791
03	Fish, crustaceans and molluscs,			Korea, Republic of	3,837
	fresh, chilled or frozen —		21	Skins and hides —	
	Rock lobster tails —			France	12,133
	United States of America	47,339		Italy	10,500
	Japan	1,733		Hungary	2,443
	Prawns —			Japan	2,425
	Japan	19,321		Germany, Federal Republic of	1,975
	United States of America	3,164	24	Timber —	
05	Fruit, fresh —			United Kingdom	2,965
	Apples —			Belgium — Luxembourg	2,534
	Singapore, Republic of	1,972	26	Wool —	
	Malaysia	1,487		Degreased (washed, scoured, etc) —	
	United Kingdom	1,314		Japan	21,208
01	Meat, fresh, chilled or frozen —			Italy	12,462
	Beef and veal —			United States of America	7,029
	United States of America	62,230		Germany, Federal Republic of	5,866
	Saudi Arabia	4,954		United Kingdom	4,835
	Singapore, Republic of	4,563		Korea, Republic of	2,098
	Canada	3,237		China — excluding Taiwan Province	2,054
	Sweden	2,486		Greasy (incl. skips) —	
	United Arab Emirates	1,811		Japan	107,425
	Malaysia	1,784		Germany, Federal Republic of	35,360
	China — Taiwan Province only	1,344		Union of Soviet Socialist Republics	28,421
	Kuwait	1,227		Italy	19,295
	Mutton and lamb —			France	16,573
	Iran	11,807		Poland	14,716
	Japan	10,724		Korea, Republic of	14,480
	Union of Soviet Socialist Republics	6,930		China — excluding Taiwan Province	10,876
	United Arab Emirates	4,693		— Taiwan Province only	9,544
	Kuwait	3,063		India	8,464
	Saudi Arabia	2,289		Belgium — Luxembourg	7,889
	Oman	2,050		Yugoslavia	6,217
	Malaysia	1,551		Netherlands	5,429
	Other (a) —			Malaysia	4,946
	Japan	2,090		German Democratic Republic	4,832
97, 99	Gold, excluding ores and concentrates —			United Kingdom	3,867
	United Kingdom	31,806		Mexico	3,683
	Hong Kong	12,733		Egypt, Arab Republic of	3,247
	Germany, Federal Republic of	11,314		United States of America	2,961
28	Ores, metalliferous —			Spain	2,045
	Ilmenite and leucoxene (b) —			Czechoslovakia	2,035
	United States of America	7,827		Romania	1,598
	United Kingdom	3,650		Portugal	1,226

(a) Comprises pigmeat, edible offals, poultry, rabbits, goat, buffalo and kangaroo meats.

(b) Excludes beneficiated ilmenite.

## AVERAGE EXPORT VALUES

The following table shows the annual average export values, during the six years ended 30 June 1980, of a number of Western Australia's principal overseas export commodities. The figures are based on the value f.o.b., or its equivalent, at the port of final shipment.

ANNUAL AVERAGE OVERSEAS EXPORT VALUES OF SPECIFIED COMMODITIES  
(\$)

Description	Unit	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Cattle hides	kg	0.44	0.39	0.70	0.74	1.32	1.49
Cereals, unmilled —							
Barley	tonne	97.14	108.65	111.34	91.23	93.32	108.62
Oats	tonne	85.11	92.59	91.14	85.13	87.10	85.72
Wheat	tonne	126.39	116.89	105.10	92.52	116.53	146.45
Crustaceans, fresh, chilled or frozen —							
Prawns and shrimps	kg	3.65	5.12	6.67	7.37	9.23	9.61
Rock lobster tails	kg	7.59	8.88	11.60	12.22	12.24	13.96
Meat, fresh, chilled or frozen —							
Beef	kg	0.84	0.91	1.00	1.12	1.73	2.26
Lamb	kg	0.70	0.81	0.89	1.02	1.24	1.11
Mutton	kg	0.65	0.61	0.78	0.92	1.16	1.17
Ores, metalliferous —							
Ilmenite (a)	tonne	12.25	13.64	15.62	16.39	16.55	17.99
Iron	tonne	8.09	9.54	10.85	12.01	11.86	13.37
Rutile	tonne	137.32	170.60	213.89	197.32	184.11	228.07
Zirconium	tonne	116.66	150.64	113.33	75.18	56.96	59.44
Petroleum and related products —							
Automotive spirit	'000 litres	55.55	86.01	105.85	103.93	134.26	233.47
Aviation kerosene	'000 litres	58.70	85.70	100.83	104.35	109.71	195.48
Lubricating oil	'000 litres	125.57	132.37	148.68	155.09	164.66	263.77
Pig and cast iron (including spiegeleisen)	tonne	108.73	68.02	74.27	75.51	90.61	125.04
Salt	tonne	4.16	5.53	6.88	7.09	6.99	7.92
Sheep and lambs, live	each	13.01	11.04	14.99	23.41	23.61	28.58
Wool —							
Degreased	kg	1.70	1.87	2.68	2.93	3.10	3.75
Greasy (including stipe)	kg	1.45	1.48	1.88	1.96	2.08	2.54

(a) Excludes beneficiated ilmenite.

## SHIPS' STORES

The following table shows the quantity and value of ships' stores loaded on board vessels at Western Australian ports during the years 1977-78 to 1979-80. The value of ships' stores is excluded from all tables appearing elsewhere in this Part.

## EXPORTS IN THE FORM OF SHIPS' STORES (a)

Description	Unit	1977-78		1978-79		1979-80	
		Quantity	Value	Quantity	Value	Quantity	Value
			\$'000		\$'000		\$'000
Beverages, alcoholic	'000 litres	1,246	1,042	1,205	1,206	1,106	1,874
Foodstuffs —							
Fresh, chilled or frozen —							
Eggs in shell	'000 doz.	182	228	124	169	208	312
Fish	tonne	193	478	125	361	270	960
Fruit and vegetables	..	..	1,102	..	1,033	..	1,369
Meat	tonne	890	1,678	671	1,507	1,022	2,816
All other foodstuffs	..	..	2,526	..	458	..	3,433
Fuel for ships and aircraft (bunker oil, etc.)	..	..	59,114	..	61,684	..	104,881
Lubricants	..	..	1,511	..	1,622	..	1,924
All other ships' stores (b)	..	..	3,329	..	4,572	..	8,607
Total	..	..	71,009	..	72,611	..	126,176

(a) Includes interstate ships' stores valued at \$1,431,233 in 1977-78, \$2,448,018 in 1978-79 and \$2,309,776 in 1979-80. When the value of overseas ships' stores recorded in any one entry is less than \$250, the stores concerned are not allocated according to commodity, but are included in the item *All other ships' stores*. (b) See footnote (a).

## OVERSEAS IMPORTS AND EXPORTS

The following table shows the total value of Australia's overseas imports and exports, together with the proportion handled at Western Australian ports, during each of the years 1974-75 to 1979-80.

OVERSEAS TRADE OF AUSTRALIA — TOTAL VALUE AND PROPORTION  
HANDLED AT WESTERN AUSTRALIAN PORTS

Year	Value of Australian trade (\$'000)			Proportion handled at Western Australian ports (per cent)		
	Imports	Exports	Total	Imports	Exports	Total
1974-75	8,079,853	8,725,774	16,805,627	7.15	21.55	14.62
1975-76	8,240,593	9,639,583	17,880,176	7.74	21.97	15.41
1976-77	10,410,645	11,651,591	22,062,236	7.97	22.28	15.53
1977-78	11,166,553	12,269,530	23,436,082	8.39	21.10	15.05
1978-79	13,752,254	14,241,167	27,993,421	8.44	19.80	14.22
1979-80	16,217,494	18,870,125	35,087,619	8.94	20.42	15.12

## CUSTOMS AND EXCISE

**The Customs Tariff**

The first Commonwealth Customs Tariff was introduced on 8 October 1901, from which date uniform duties came into effect throughout Australia. The Australian Customs Tariff has been developed in conformity with the policy of protecting economic and efficient Australian industries and of granting preferential treatment to imports from certain countries. Duties are imposed on some goods, generally of a luxury nature, for revenue purposes. Customs collections are a major source of revenue, but in its protective character the tariff has an important influence on the Australian economy.

The Australian Customs Tariff currently in use was introduced on 1 July 1965. The nomenclature used in the Tariff is that of the Convention on Nomenclature for the Classification of Goods in Customs Tariffs, an international agreement signed at Brussels on 15 December 1950. The system of naming established by the Convention is known as the 'Customs Co-operation Council Nomenclature' (previously the Brussels Tariff Nomenclature).

## *Chapter IX—continued*

### **Part 2 — Internal Trade**

#### **CENSUSES OF WHOLESALE, RETAIL AND SELECTED SERVICE ESTABLISHMENTS**

Statistics of internal trade in Western Australia are derived mainly from the programme of integrated economic censuses which was introduced in 1968-69 and is described in more detail in the introduction to Chapter VIII.

Wholesale and retail trade comprises Division F of the Australian Standard Industrial Classification (ASIC) which is also described in Chapter VIII. Wholesale trade is described in ASIC as the re-sale (as agent or principal) of new or used goods to retailers or other wholesalers, or to institutional, government, professional or business users. Retail trade is described as the re-sale of new or used goods to final consumers for personal or household consumption. The selected service industries surveyed in the programme are included in Division L of ASIC, 'Entertainment, Recreation, Restaurants, Hotels and Personal Services'.

#### **CENSUS OF WHOLESALE ESTABLISHMENTS**

The first Census of Wholesale Establishments was conducted in 1968-69 and detailed statistics for Western Australia were published in the bulletin *Economic Censuses 1968-69: Wholesale Establishments (Final), Western Australia*. Bulletins relating to each of the other States and Territories and Australia as a whole were also published. The data items were classified variously to each industry class within Sub-division 46-47 'Wholesale Trade' of ASIC; to broad types of operation (i.e. primary produce dealers or agents, wholesale merchants, manufacturers' sales branches holding stocks, commission agents or brokers, petroleum distributors, or repairers and lessors of machinery and equipment); to area (i.e. local government area and statistical division) and to size of establishment, based on wholesale sales.

A summary of the data of the 1968-69 Wholesale Census appeared in the *Western Australian Year Book*, issues No. 11 — 1972 to No. 15 — 1976.

#### **CENSUSES OF RETAIL AND SELECTED SERVICE ESTABLISHMENTS**

Five retail censuses had been conducted prior to the inclusion of a Census of Retail and Selected Service Establishments in the system of integrated economic censuses in 1968-69. These earlier censuses related to the years 1947-48, 1948-49, 1952-53, 1956-57 and 1961-62 and covered (i) the retail trading activities of all establishments selling to the general public from fixed premises such as shops, rooms, kiosks and yards and (ii) the service activities of establishments such as motor repair workshops, hairdressers, boot repairers, cafes and restaurants. Licensed clubs and laundries and dry cleaners were included in collections supplementary to retail censuses from 1952-53 onwards and motion picture theatres were included in collections supplementary to the 1956-57 and 1961-62 Retail Censuses. Statistics from these censuses were published in bulletins for each State and Territory and for Australia as a whole. The censuses were also used to provide a framework for conducting quarterly sample surveys of retail sales.

The 1968-69 Census of Retail and Selected Service Establishments included all establishments in Sub-division 48: 'Retail Trade' of ASIC and establishments from selected industry classes in Division L: 'Entertainment, Recreation, Restaurants, Hotels and Personal Services'. The selected industry classes were 9113 Motion Picture Theatres; 9211 Cafes and

Restaurants; 9212 Licensed Hotels, Motels and Wine Saloons; 9221 Licensed Bowling Clubs; 9222 Licensed Golf Clubs; 9223 Licensed Clubs n.e.c.; 9310 Laundry and Dry Cleaning Services; 9321 Men's Hairdressing; and 9322 Women's Hairdressing and Beauty Salons.

Since the 1968-69 Census was based on definitions from the ASIC it differed from previous censuses in that it was restricted to establishments primarily engaged in retailing or the selected services and excluded the retailing or service activities of other types of establishments (e.g. wholesalers, manufacturers). The use of ASIC also involved another change in that all the activities of each establishment included in the census were measured, including non-retail or non-service activities, whereas in previous censuses only the retail or service activities were included. For example, for a retail establishment also engaged in wholesaling, all employees were included in the 1968-69 Census whereas in previous censuses the employees engaged in wholesaling would have been excluded.

A further retail census also based on ASIC principles was conducted for the year 1973-74.

The 1973-74 Retail Census differed from the previous censuses in scope, coverage and data content. It was conducted primarily to provide the basic data needed to enable a new sample of retail establishments to be selected for the quarterly Survey of Retail Establishments following the 1973-74 Retail Census. For this reason, bread and milk vendors, footwear repairers, motion picture theatres and laundries and dry cleaners were excluded from the 1973-74 Retail Census although they were included in the scope of the previous census taken in 1968-69. Similarly, questions relating to purchases, stocks, capital expenditure, etc. which were included on the 1968-69 Census forms were not included on the 1973-74 Census forms.

In the 1968-69 Census, where ownership of an establishment changed hands during the census year and separate returns were received from the current and previous proprietors, both returns were included in the census. In the 1973-74 Retail Census, however, establishments which operated for part of the census year were included in the census only if they had operated for at least two months of the census year and were still operating at 30 June 1974.

Detailed results for each census have been published for each State and Territory and for Australia as a whole. Results of the 1968-69 Census were published in *Economic Censuses: 1968-69, Retail Establishments and Selected Service Establishments* in four parts as follows: *Details of Operations by Industry Class and Area*, *Industry and Commodity Details for Statistical Retail Areas*, *Industry and Commodity Details by Size of Establishment*, and *Commodity Sales*. Results of the 1973-74 Census were published in *Census of Retail Establishments and Selected Service Establishments, Final Bulletin, 1973-74*. A summary of the data of the 1973-74 Retail Census appeared in the *Western Australian Year Book*, issues No. 14 — 1975 to No. 17 — 1979.

The retail census undertaken for the year ended 30 June 1980 will provide data similar to that published for 1968-69. The first available tables relating to the 1979-80 Retail Census can be found in the *Appendix*.

### **Commodity Statistics**

Details of retail sales of groups of commodities were collected in the 1973-74 Census of Retail Establishments and Selected Service Establishments. Retail sales were defined as the sale to final consumers of new or used goods of a type used mainly for household and personal purposes. Sales by retailers of commodities such as basic building materials, builders' hardware and builders' supplies, timber, commercial refrigerators and freezers, agricultural tractors, farm machinery and implements, construction and earthmoving equipment, grain, feed, fertilisers and agricultural supplies, and business machines and equipment, were treated as wholesale sales since the goods are of a type used mainly for commercial purposes.

A table showing retail sales made by retail and selected service establishments which were in operation at 30 June 1974 appeared in the *Western Australian Year Book*, issues No. 14 — 1975 to No. 17 — 1979.



## SURVEY OF RETAIL ESTABLISHMENTS

During the periods between retail censuses, quarterly estimates of the value of retail sales by commodity groupings are derived from a sample of retailers throughout the six States of Australia. The sample is drawn from the population of retail establishments enumerated in the censuses which is maintained by the addition of new businesses and the deletion of businesses which cease trading.

Statistics for the current series of estimates are available for quarters from September quarter 1975 onwards and are based on the 1973-74 Census of Retail and Selected Service Establishments.

The table below shows estimates of retail sales by commodity groups for the years 1975-76 to 1979-80.

RETAIL SALES — COMMODITY GROUPS  
(\$ million)

Commodity group	Year				
	1975-76	1976-77 r	1977-78 r	1978-79 r	1979-80
Groceries	314.3	374.8	459.9	522.0	588.3
Butchers' meat	73.4	93.2	110.1	128.6	155.5
Other food (a)	161.8	194.2	224.9	252.4	282.3
Beer, wine and spirits	229.5	268.3	297.4	347.2	363.9
Clothing, drapery, etc.	240.1	273.4	302.8	321.3	346.0
Footwear	37.0	42.9	48.7	55.3	61.9
Hardware, china and glassware (b)	66.9	75.9	85.4	96.1	107.4
Electrical goods and musical instruments	160.5	184.6	176.8	180.2	194.2
Furniture, floor coverings, mattresses	96.3	113.8	116.3	121.4	133.8
Chemists' goods	80.9	83.9	93.4	99.7	107.4
Newspapers, books, stationery	48.3	58.6	66.8	74.2	87.4
Other goods (c)	137.0	153.1	164.1	191.3	202.9
Total	1,646.0	1,916.7	2,146.6	2,389.7	2,631.0

(a) Includes fresh fruit and vegetables, confectionery, soft drinks, ice cream, cakes, pastry, cooked provisions, fish and wrapped lunches. (b) Excludes basic building materials, builders' hardware and supplies, such as tools of trade, paint, etc. (c) Includes tobacco, cigarettes, sporting goods etc. but excludes grain and produce and business machines.

Seasonally adjusted retail sales statistics, estimates of the value of retail sales of goods at constant (average 1974-75) prices and further information regarding quarterly estimates of retail sales, together with comparable data for each State and Australia are published by the Australian Statistician in *Retail Sales of Goods* (Catalogue No. 8503.0). Preliminary quarterly estimates of total retail sales for each State and estimates of retail sales for three major commodity groupings for Australia are released in *Retail Sales of Goods, Australia* (Preliminary) (Catalogue No. 8502.0) and monthly estimates of total retail sales in Australia based on a sub-sample of those establishments included in the quarterly sample appear in *Retail Sales of Goods, Australia* (Catalogue No. 8501.0).

## RETAIL FLOOR SPACE STATISTICS

During the period covered by the 1973-74 Census of Retail Establishments and Selected Service Establishments, the Metropolitan Region Planning Authority (M.R.P.A.) commissioned a firm of consultants to prepare a report which involved, among other things, the collection of statistics on floor space used for retailing. The title of this report is 'Perth Metropolitan Region Retail Shopping Survey 1973'. As the floor space data collected for this report related in general to establishments which were operating at 31 December 1973, the mid-point of the 1973-74 Census of Retail Establishments and Selected Service Establishments, the opportunity was taken by the Bureau to match the two sources of data and produce statistics relating turnover to floor space for the Perth Statistical Division.

In compiling the floor space statistics some adjustments were necessary because of differences in scope and coverage between the two data sources. Statistics by floor space therefore, differ from those previously published in the Bureau publication *Census of Retail Establishments and Selected Service Establishments, Final Bulletin, Western Australia, 1973-74* (Catalogue No. 8601.5) and the report 'Perth Metropolitan Region Retail Shopping Survey 1973'. Details of the adjustments necessary to reconcile the data sources are outlined in the bulletin *Western Australia, Retail Floor Space, 1973-74* (Catalogue No. 8605.5).

### CENSUS OF TOURIST ACCOMMODATION ESTABLISHMENTS

A Census of Tourist Accommodation Establishments covering aspects such as the amount, type, and geographical location of tourist accommodation available throughout Australia was conducted for the year ended 30 June 1974.

Tourist accommodation establishments, for the purpose of this census, have been defined as: (i) hotels, motels and guest houses, which provide short-term (i.e. for periods of less than two months) accommodation available to the general public and which provide breakfast; (ii) caravan parks and holiday flats which provide short-term accommodation available to the general public.

The census covered, in general, tourist accommodation establishments which were in operation at 30 June 1974 but excluded those establishments at which the number of guest rooms usually occupied by short-term guests was less than 40 per cent of the total number of guest rooms usually occupied and, also, establishments which have provision for tourist accommodation but which had nil takings from accommodation for the census period. Details for holiday flats were collected for the State of Queensland only.

Establishments included in the census were classified to a type of establishment dependent on the method of operation and the facilities available at the establishment. The establishments were classified as follows.

Licensed hotel — an establishment which provides tourist accommodation and is licensed to operate a public bar.

Licensed motel — an establishment which provides tourist accommodation and, in general, provides bath or shower and toilet in most guest rooms as well as vehicle parking for guests and is licensed to serve liquor with meals.

Unlicensed motel — an establishment which provides tourist accommodation and which provides bath or shower and toilet in most guest rooms as well as vehicle parking for guests but is not licensed to serve liquor. It should be noted that this category included establishments which had a licensed restaurant located at the establishment but which was leased to and operated by a separate enterprise.

Private hotel or guest house — an establishment which provides tourist accommodation but which does not provide both vehicle parking for guests and facilities (i.e. bath or shower and toilet) in most guest rooms and which is not licensed to served liquor.

Caravan park — an establishment which provides tourist accommodation and is registered as a caravan park with a local government authority. Where an enterprise operated both a caravan park and a motel at the same location, separate details were collected for each and they were treated as two establishments.

Detailed information on the Census of Tourist Accommodation is available from the publication *Census of Tourist Accommodation Establishments, Western Australia, 1973-74* (Catalogue No. 8604.5) which includes items of data by type and size of establishment and by local government area and statistical division. A summary table showing details of operations by type of establishment for Western Australia appeared in the *Western Australian Year Book*, issues No. 14 — 1975 to No. 17 — 1979.

## TOURIST ACCOMMODATION SURVEY

Following the Census of Tourist Accommodation Establishments, the Australian Bureau of Statistics introduced a series of quarterly Tourist Accommodation Surveys, commencing with the September quarter 1975.

The scope of the survey is the same as the census but the various types of establishment have been regrouped as follows:

Licensed hotels with facilities — establishments which provide tourist accommodation, are licensed to operate a public bar and provide bath or shower and toilet facilities in most guest rooms.

Motels, private hotels, etc. with facilities — licensed or unlicensed motels, private hotels or guest houses which provide bath or shower and toilet facilities in most guest rooms, but are not licensed to operate a public bar. Motels which are licensed to serve liquor with meals are included in this category.

Establishments without facilities — licensed hotels, private hotels or guest houses which provide tourist accommodation but which do not provide bath or shower and toilet facilities in most guest rooms.

TOURIST ACCOMMODATION SURVEY  
HOTELS, MOTELS AND GUEST HOUSES

Year	At 31 December, number of —			Arrivals '000 persons	Occupancy rates (per cent) of —		Takings from accom- modation \$'000
	Establish- ments	Guest rooms	Bed spaces		Rooms	Beds	
LICENSED HOTELS WITH FACILITIES							
1976	123	3,038	5,866	412.8	54	40	10,012
1977	120	2,966	5,853	431.6	57	41	11,816
1978	122	3,097	6,106	441.4	54	39	13,818
1979	123	3,090	6,219	425.0	54	38	15,945
1980	130	3,274	6,669	421.2	53	36	17,460
MOTELS, PRIVATE HOTELS, ETC. WITH FACILITIES							
1976	96	4,087	10,031	653.1	59	40	14,381
1977	102	4,183	10,419	688.4	58	40	17,259
1978	110	4,645	11,535	676.7	53	36	18,650
1979	115	4,815	12,186	712.0	52	35	22,282
1980	114	4,834	12,178	712.5	50	33	23,231
ESTABLISHMENTS WITHOUT FACILITIES							
1976	259	4,165	6,699	270.8	39	32	4,656
1977	249	4,256	6,997	265.4	39	30	4,920
1978	238	4,009	6,590	226.6	36	28	4,870
1979	237	4,011	6,690	207.6	34	26	5,047
1980	225	3,693	6,295	195.7	32	24	4,960
TOTAL							
1976	478	11,290	22,596	1,336.7	50	37	29,048
1977	471	11,405	23,269	1,385.4	51	37	33,994
1978	470	11,751	24,231	1,344.7	48	35	37,338
1979	475	11,916	25,095	1,344.6	47	33	43,274
1980	469	11,801	25,142	1,329.4	45	32	45,651

Caravan parks have been included in the Western Australian survey from September quarter 1975 and in other States' surveys from September quarter 1977.

Detailed information (including monthly items of data by type of establishment and area) on the Tourist Accommodation Survey is available from the quarterly publication *Tourist Accommodation* (Catalogue No. 8603.5), issued by this Office.

### TOURIST ACCOMMODATION SURVEY CARAVAN PARKS

Particulars	1976	1977	1978	1979	1980	
Number of establishments at 31 December	176	197	200	218	229	
Capacity —						
Powered sites	9,015	10,356	11,206	12,342	12,751	
Unpowered sites	2,190	2,447	2,730	3,705	3,765	
Cabins, flats, etc.	419	433	440	467	484	
Total capacity at 31 December	11,624	13,236	14,376	16,514	17,000	
Site occupancy rate	per cent	33	37	36	32	28
Guest nights	'000	4,007.8	4,864.4	5,197.7	5,060.2	(a)
Arrivals	'000 persons	663.4	763.5	771.7	756.1	754.0
Takings from accommodation	\$'000	4,367	5,773	7,265	7,879	8,254

(a) Data not collected.

### CONSUMER PROTECTION

The *Consumer Protection Act 1971* provided for the formation of a Consumer Affairs Council and a Consumer Protection Bureau. The legislation was introduced to protect and advance the interests of consumers, as buyers, in their relationships with sellers. The Bureau commenced operations on 11 August 1972 and the inaugural meeting of the Council was held on 21 February 1973. In 1975 the title of the Consumer Protection Bureau was changed to the Bureau of Consumer Affairs by an amendment to the Act which then became the *Consumer Affairs Act 1971-1975*. In November 1978, the *Consumer Affairs Act Amendment Act 1978* established a Consumer Products Safety Committee to advise the Commissioner on the restriction or banning of dangerous consumer products.

The Consumer Affairs Council consists of twelve members representative of a wide cross-section of business and community interests. Broadly, the functions of the Council are to: recommend legislative and administrative action considered necessary in the interests of consumers; advise the Minister on any matters he may refer to the Council; and make recommendations to the Minister on the means by which matters affecting consumers and others interested in the supply of goods or services may receive adequate consideration and to supply information about such matters.

The Bureau of Consumer Affairs is headed by a Commissioner for Consumer Affairs and broadly its functions are to: promote the interests of consumers; collect, collate and disseminate information on matters of interest to consumers; receive and investigate complaints from consumers and if necessary take appropriate remedial action; advise and assist consumers who seek information; assist the Council as required; and disseminate information concerning consumer affairs to producers, manufacturers and suppliers of goods or services.

In conjunction with the Department of Labour and Industry the Bureau also administers directly the following Acts: Motor Vehicle Dealers Act, Door to Door (Sales) Act, Pyramid Sales Schemes Act, Trade Descriptions and False Advertisements Act, Hire-Purchase Act, Unsolicited Goods and Services Act, and Clothes and Fabrics (Labelling) Act.

In addition to the Acts directly administered by the Bureau there are a number of others administered by other authorities which safeguard the interests of consumers. The Bureau works closely with these authorities when handling complaints involving Acts administered by them and in many cases refers complainants directly to them.

Before taking action on a complaint the Bureau requires written advice about the matter from the consumer and evidence that he has made a reasonable attempt to resolve the problem before approaching the Bureau. Subsequent to receiving an apparently justifiable complaint the Bureau contacts the firm or company involved (usually by letter) outlining the complaint and requesting information which will resolve or clarify the situation. If the firm does not co-operate the Bureau has three direct courses of action open to it. The Commissioner may, under

threat of prosecution, demand information from any party able to assist the investigation, or he may, under warrant, enter the premises and take or copy any document useful to his investigation, or he may take or defend civil actions on behalf of the consumer if the matter is considered to be in the public interest and he has the approval of the Minister. Apart from direct action as outlined above the Commissioner may arrange for prosecution to be undertaken under an Act not administered by him or he may recommend to the State Government that specific legislation be enacted in broad areas that affect the consumer.

Since 1 July 1977, the Bureau, in association with the other State Bureaus and the Trade Practices Commission, has been participating in the production of a national computerised index of consumer complaints. The system enables each agency to readily assess and compare trends on a State by State and national basis. The system provides for each formal complaint to be coded in accordance with the product or service classification and the practice classification as detailed in the table below. Provision is made for formal complaints to be classified once under the product or service classification and once or twice under the practice classification depending on the nature of the complaint. For example, a complaint alleging that a manufacturer refused to repair under warranty a newly-purchased washing machine would be recorded once under the product or service classification (to Consumer durables) and twice under the practice classification (to Quality of product or service and Guarantees and warranties).

BUREAU OF CONSUMER AFFAIRS COMPLAINTS ANALYSIS: 1979-80  
(Source: Bureau of Consumer Affairs)

Product classification	Practice classification										Total (a)
	Com-plaints	Advertis-ing rep-resent-ations	Pack-aging and label-ling	Sales methods	Prices or charges	Quality of product or service	Credit prac-tices	Contracts	Guaran-tees and warran-ties	Offers of redress	
Food, beverages, tobacco	44	11	8	1	3	18	—	2	—	1	44
Clothing, footwear, drapery	235	7	5	12	5	161	4	31	2	27	254
Consumer durables	835	21	2	34	36	487	8	106	155	9	858
Motor vehicles and transport equipment	1,912	25	—	6	81	560	31	277	940	6	1,926
Building and construction	1,004	9	—	7	85	690	1	152	67	7	1,018
Miscellaneous products	509	16	1	115	17	211	5	170	39	11	585
Transport and energy services	161	5	—	—	36	48	2	62	—	8	161
Insurance and finance	396	—	—	2	3	16	165	209	1	—	396
Real estate and accommodation	264	7	—	—	9	9	5	233	—	1	264
Miscellaneous services	453	16	—	14	56	197	5	162	1	2	453
Total	5,813	117	16	191	331	2,397	226	1,404	1,205	72	5,959

(a) Some complaints have been recorded twice under the practice classification.

## Chapter IX—continued

### Part 3 — Transport

Western Australia's main transport systems are based generally on Perth, the capital, and on Fremantle, the principal port. Subsidiary systems are centred on a number of outports north and south of Fremantle and on some inland towns.

The following table shows distances by road, rail, sea and air between Perth and selected towns and localities in Western Australia.

DISTANCES BETWEEN PERTH AND SELECTED TOWNS AND LOCALITIES  
IN WESTERN AUSTRALIA

Town or locality	Road r	Rail	Sea (a)	Air (b) r	Town or locality	Road r	Rail	Air (b) r
North of 26°S latitude —	kilo-	kilo-	nautical	route	South of 26°S latitude —	kilo-	kilo-	route
Coastal —	metres	metres	miles	metres	Inland — <i>continued</i>	metres	metres	kilo-
Broome	2,204	..	1,193	1,687	Bruce Rock	242	308	..
Carnarvon	898	..	484	833	Collie	202	198	..
Dampier	1,556	..	..	..	Coolgardie	557	..	..
Denham (Shark Bay)	832	..	479	737	Donnybrook	205	209	..
Derby	2,358	..	1,358	1,813	Forrest	1,492	1,300	1,176
Exmouth	1,260	..	683	(c)1,130	Harvey	140	138	..
Karratha	1,537	..	(d)857	1,296	Hyden	339	554	..
Onslow	1,389	..	733	..	Kalgoorlie	596	655	539
Port Hedland	(e)1,658	..	957	1,330	Kambalda	632	704	..
Roebourne	1,562	..	(f)885	..	Katanning	278	393	..
Wyndham	3,203	..	1,761	..	Koolyanobbing	422	455	..
Inland —					Leonora	833	914	622
Fitzroy Crossing	2,538	..	..	2,033	Madura	1,254	..	..
Goldsworthy	1,701	..	..	1,423	Manjimup	299	313	..
Halls Creek	2,829	..	..	2,257	Meekatharra	765	..	654
Kununurra	3,188	..	..	2,382	Merredin	260	284	..
Marble Bar	1,477	..	..	1,299	Moora	172	174	..
Newman	1,187	..	..	1,030	Mount Barker	359	517	..
Nullagine	1,365	..	..	1,206	Mukinbudin	293	358	..
Paraburdoo	1,538	..	..	1,004	Mullewa	450	544	..
Tom Price	1,555	..	..	1,052	Nannup	277	289	..
Wittenoom	(e)1,449	..	..	1,126	Narrogin	192	292	..
South of 26°S latitude —					Newdegate	399	523	..
Coastal —					Norseman	724	833	552
Albany	409	578	353	400	Northam	99	120	..
Augusta	315	..	..	..	Pinjarra	87	86	..
Bunbury	175	184	104	172	Ravensthorpe	541	..	..
Busselton	224	236	..	..	Southern Cross	369	403	332
Esperance	730	1,033	560	587	Wagin	229	341	..
Eucla	1,436	..	..	..	Wiluna	948	..	761
Fremantle	18	19	..	..	Wyalkatchem	191	237	..
Geraldton	424	493	215	389	York	97	156	..
Inland —								
Bridgetown	262	277	..	..				

(a) From Fremantle. (b) Shortest regular route. (c) Distance to Learmonth. (d) Distance to Dampier. (e) Inland route. (f) Distance to Port Walcott.

The railway system extends from Fremantle, Perth and Midland for hundreds of kilometres into the mining, agricultural, pastoral and forest areas in the southern half of the State. There is also a well-developed road system in this area, and the coastal towns in the north-west and the north are connected by the road with the south and with the pastoral and mining areas of the

hinterland. The Western Australian Coastal Shipping Commission operates a shipping service which connects Fremantle with the north of the State, the Eastern States and the Northern Territory. International flights operate through the airport at Perth, which is also the centre of a comprehensive network of airline services to towns in Western Australia and to the capital cities of other States.

In recent years important mineral developments in the north-west have led to the provision of deep-water port facilities and the construction of railways and roads connecting them with the extensive iron ore deposits now being exploited.

### SHIPPING

Western Australia's sea-borne trade is conducted through the Port of Fremantle and a number of outports. Of these, Geraldton, Bunbury, Albany and Esperance are situated in the more highly developed south-western and southern parts of the State. The less closely-settled areas of the north-west and the north are served by ports and other landing points at Useless Loop (Shark Bay), Carnarvon, Cape Cuvier, Exmouth, Barrow Island, Dampier, Port Walcott (Cape Lambert), Port Hedland, Broome, Derby, Yampi and Wyndham.

The following table shows the number of entrances into and clearances from each port by vessels coming direct from or going direct to overseas ports during the years 1977-78 to 1979-80. The figures exclude particulars of naval vessels; yachts and other craft used for pleasure; foreign fishing vessels that neither load nor discharge cargo; geophysical and oceanographic research vessels; oil-drilling rigs and vessels servicing them; and vessels of 200 registered net tons and under.

The importance of mineral developments in the north-west of the State is evident from the numbers of entrances and clearances in the ports of Dampier, Port Hedland and Port Walcott. They are surpassed only by the Port of Fremantle, the principal port of Western Australia.

NUMBERS OF OVERSEAS DIRECT VESSELS ENTERED AND CLEARED AT EACH PORT

Port	Entrances			Clearances		
	1977-78	1978-79	1979-80	1977-78	1978-79	1979-80
Port of Fremantle	692	610	685	840	753	836
Other ports —						
Albany	52	47	55	62	58	76
Broome	9	9	9	2	3	1
Bunbury	91	85	105	94	86	88
Carnarvon (a)	51	61	50	58	62	49
Dampier	426	471	410	430	471	434
Derby	7	13	15	—	9	11
Esperance	40	34	26	35	36	30
Exmouth	3	3	3	—	—	—
Geraldton	88	77	94	28	35	47
Port Hedland	382	449	376	357	408	351
Port Walcott (b)	118	117	136	116	114	133
Wyndham	14	16	19	16	18	25
Yampi	58	48	37	55	51	41
Total	1,339	1,430	1,335	1,253	1,351	1,286
All ports	2,031	2,040	2,020	2,093	2,104	2,122

(a) Includes Cape Cuvier and Useless Loop.

(b) Includes Cape Lambert.

**NUMBERS OF OVERSEAS DIRECT VESSELS ENTERED AND CLEARED AT EACH PORT  
CLASSIFIED BY TYPE OF VESSEL: 1979-80**

	Type of vessel						
Port	Bulkship	Tanker	Container	Roll-on, roll-off	Conventional cargo	Other	Total
ENTRANCES							
Port of Fremantle	327	75	76	20	37	150	685
Other ports —							
Albany	44	1	1	—	8	1	55
Broome	—	—	—	—	6	3	9
Bunbury	102	—	—	—	3	—	105
Carnarvon (a)	42	5	—	—	3	—	50
Dampier	408	—	—	—	—	2	410
Derby	—	15	—	—	—	—	15
Esperance	25	—	—	—	—	1	26
Exmouth	—	—	—	—	—	3	3
Geraldton	86	—	—	—	5	3	94
Port Hedland	337	12	—	—	10	17	376
Port Walcott (b)	129	5	—	—	1	1	136
Wyndham	—	2	2	—	6	9	19
Yampi	35	1	—	—	—	1	37
Total	1,208	41	3	—	42	41	1,335
All ports	1,535	116	79	20	79	191	2,020
CLEARANCES							
Port of Fremantle	385	74	87	38	114	138	836
Other ports —							
Albany	60	4	—	—	8	4	76
Broome	—	1	—	—	—	—	1
Bunbury	85	—	—	—	3	—	88
Carnarvon (a)	46	—	—	—	3	—	49
Dampier	422	11	—	—	—	1	434
Derby	—	11	—	—	—	—	11
Esperance	18	—	—	—	—	12	30
Exmouth	—	—	—	—	—	—	—
Geraldton	41	—	—	—	4	2	47
Port Hedland	348	1	—	—	—	2	351
Port Walcott (b)	131	2	—	—	—	—	133
Wyndham	1	8	7	—	—	9	25
Yampi	39	1	—	—	—	1	41
Total	1,191	39	7	—	18	31	1,286
All ports	1,576	113	94	38	132	169	2,122

(a) Includes Cape Cuvier and Useless Loop.

(b) Includes Cape Lambert.

Cargo is recorded on returns either in terms of tonnes or of cubic metres depending on the basis on which freight is charged. In the following table the statistics for cargo recorded in tonnes are shown separately from cargo recorded in cubic metres. A figure for gross weight, that is the total weight of cargo excluding the weight of containers, irrespective of the basis on which freight is charged, is also shown.

Apart from general cargo, overseas consignments discharged were principally petroleum and petroleum products, rock phosphate, caustic soda, limestone, sands and sulphur. Outward cargoes from Fremantle consisted largely of alumina, cereal grains, iron and steel, refined petroleum and mineral sands. Cargo loaded at Esperance comprised mainly cereal grains, salt and sheep; and at Albany cereal grains, sheep and tallow. At Bunbury the principal cargoes loaded were alumina, mineral sands, woodchips and cereal grains. Cereal grains and mineral sands were the main items loaded at Geraldton. In the northern part of the State, Dampier, Port Hedland, Port Walcott and Yampi are the major ports for the loading of iron ore. From other ports in the area, cargoes loaded consisted mainly of salt, gypsum and meat.



## OVERSEAS CARGO LOADED AND DISCHARGED AT EACH PORT: 1979-80

Port	Loaded			Discharged		
	Tonnes	Cubic metres	Gross weight (tonnes) (a)	Tonnes	Cubic metres	Gross weight (tonnes) (a)
Port of Fremantle	6,544,962	121,388	6,638,406	5,127,426	449,888	5,355,317
Other ports —						
Albany	1,042,828	—	1,042,828	154,017	107	154,066
Broome	5,240	—	5,240	4,226	1,438	4,922
Bunbury	2,955,344	496	2,955,840	181,641	—	181,641
Carnarvon (b)	723,663	—	723,663	29,009	—	29,009
Dampier	38,889,978	102	38,890,029	236,399	—	236,399
Derby	4,000	—	4,000	18,260	1,102	18,811
Esperance	439,788	—	439,788	53,485	—	53,485
Exmouth	380	—	380	115	4,689	1,432
Geraldton	1,514,918	254	1,515,172	90,555	1,098	91,226
Port Hedland	29,304,934	—	29,304,934	113,995	6,764	116,748
Port Walcott (c)	14,708,917	—	14,708,917	271,047	—	271,047
Wyndham	27,253	—	27,253	22,398	—	22,398
Yampi	2,340,151	—	2,340,151	2,000	—	2,000
Total	91,957,394	852	91,958,195	1,177,147	15,198	1,183,184
All ports	98,502,356	122,240	98,596,601	6,304,573	465,086	6,538,501

(a) See text preceding table. (b) Includes Cape Cuvier and Useless Loop. (c) Includes Cape Lambert.

The Western Australian Coastal Shipping Commission was established in 1965 to carry on the services formerly maintained by the State Shipping Service. The Commission's ships operate along the north-west and northern coasts, calling regularly at ports between Fremantle and Darwin (Northern Territory). Besides general cargo, the freight discharged at north-west and northern ports consists mainly of refined petroleum products, bulk cement and other building and construction materials, refrigerated cargo, vehicles and drilling equipment. Cargoes carried south to Fremantle are mainly primary products (such as meat, grains and prawns) and vehicles.

The Commission also maintains a regular link between Fremantle, Bunbury and Melbourne and Tasmanian ports, bringing a range of general cargo including newsprint, other paper products and steel into the State and carrying Western Australian goods (mainly ilmenite and wheat) eastward.

### Administration of Ports

The State Government, through the Harbour and Light Department, controls the ports at Broome, Carnarvon, Derby, Port Walcott (Cape Lambert) and Wyndham. The ports at Albany, Bunbury, Esperance, Fremantle, Geraldton and Port Hedland are controlled by separately-constituted authorities established by Act of Parliament. Private operators control the ports (or landing points) at Barrow Island, Cape Cuvier, Dampier, Exmouth, Useless Loop and Yampi.

### Description of Principal Ports

A brief description of the principal ports, at 30 June 1980, is given below. Reference to previous articles on ports appears in the *Appendix*.

**Albany.** The port of Albany (35°S latitude) is the most southerly port in Western Australia and comprises the waters of Princess Royal Harbour and King George Sound. The effect of tidal movements is negligible and as there is little trouble from fog or storm it is an all-weather port. It embraces an area of 11,800 hectares having an abundance of natural deep water and affording excellent protection to shipping and shore works. Access to Princess Royal Harbour from King George Sound is by means of a channel of 12.2 metres minimum depth and 145 metres wide. Wharfage consists of five berths situated on the northern side of the harbour. A timber jetty, adjacent to the entrance channel, provides two berths, one of which is 244 metres in length with a depth alongside of 10.0 metres, and the other 152 metres in length with a depth

alongside of 7.6 metres. The remaining berths consist of three land-backed berths with a continuous length of 609 metres and a depth alongside of 10.4 metres at No. 1 and No. 2 berths and a depth alongside of 12.2 metres at No. 3 berth.

**Bunbury.** The port of Bunbury (33°S latitude) is situated in Koombana Bay, 104 nautical miles south of Fremantle, and comprises an inner and outer harbour. It is an all-weather port with a tidal rise and fall of 0.8 metres influenced by weather conditions.

Access to the inner harbour is by means of a dredged channel approximately 2.4 kilometres in length, 12.2 metres in depth and 121 metres wide. The maximum loaded draft permitted in the inner harbour is 11.6 metres. Separate berths, linked by conveyor to shipside storage, provide for the loading of alumina and woodchips at the rate of 2,000 tonnes and 1,000 tonnes per hour, respectively. There is a general purpose berth, 240 metres in length capable of handling roll on/roll off cargo.

The deepest permissible loaded draft of the outer harbour, 8.7 metres, is subject to a small increase at the harbour master's discretion. Wharf berth accommodation consists of two jetty berths with rail access only, each 183 metres in length and two land-backed berths each 184 metres in length. There is a conveyor with a capacity of 900 tonnes per hour used for loading mineral sands and a bulk grain loading facility with a capacity of some 400 tonnes per hour. The cargo transit shed has a cool storage capacity of some 2,300 cubic metres.

**Esperance.** The port of Esperance (33°S latitude) is situated in Esperance Bay on the south coast of Western Australia. The port has two land-backed berths of concrete and steel construction. Together, they provide a continuous structure 457 metres long, dredged to a depth alongside of 11.0 metres, with a land area backing of approximately forty-seven hectares.

The approach channel to the land-backed berths is 244 metres wide and is dredged to a depth of 11.0 metres. The deepest permissible loading draft is ten metres. Two privately-owned ship loaders are available; one with a loading capacity rate of 860 tonnes per hour, handles salt and bulk grains, the latter product being drawn from a 133,000 tonne capacity storage terminal. The other conveyor, which has a capacity of some 200 tonnes per hour, is used for the loading of minerals. An underground pipeline enables petroleum discharged at No. 2 berth to be conveyed three kilometres to inland storage tanks.

**Fremantle.** The port of Fremantle (32°S latitude) is the principal port of Western Australia. It is an all-weather port, virtually tideless and little troubled by storm or fog. The port provides modern facilities for the handling of ships, passengers and cargo and is connected to the road and rail systems of Western Australia and Australia generally. It has an area of 44,700 hectares and comprises an Inner Harbour and an Outer Harbour.

The Inner Harbour is constructed within the mouth of the Swan River, about nineteen kilometres from Perth. It is protected by two breakwaters, one 1,474 metres in length and the other 620 metres. The harbour is approached through a short entrance channel dredged to a depth of eleven metres at low water. It encloses eighty-one hectares of water dredged throughout to eleven metres at low water and is the centre of the general cargo trade of the port. There are twenty land-backed berths, with a total quayage of about 4,000 metres. Transit sheds occupy an area of 56,800 square metres and large paved areas are provided for the open storage of cargo. The Inner Harbour is well equipped to handle container, roll-on/roll-off and unit-load cargoes. Further provision is being made to extend facilities by rebuilding some of the older berths.

The Outer Harbour has 18,900 hectares of deep water and is protected from the west by islands and reefs. It embraces three main anchorages of depths up to nineteen metres. Gage Roads, the most northerly of these anchorages, serves as an approach to the Inner Harbour. Owen Anchorage is centrally situated between Success and Parmelia Banks. The

largest and most protected of the anchorages, Cockburn Sound, lies to the south and serves the Kwinana industrial area.

There are six jetties in Cockburn Sound. Five of these are owned and operated by private companies concerned with specialised cargoes. They comprise a jetty for the export of grain, an oil refinery jetty, two jetties to serve a blast furnace and a steel-rolling mill, and a jetty for the export of refined alumina and the import of caustic soda. The sixth jetty, a common-user facility, built by the Port Authority is used mainly for imports of rock phosphate and sulphur.

All Inner Harbour berths are equipped to supply bunker fuel direct to ships from privately-owned storage tanks close to the port and an oil lighter is available to service ships berthed in the Inner Harbour or anchored in the Outer Harbour. Ships can also take on bunker fuel oil at the oil refinery jetty and bulk cargo jetty in the Outer Harbour.

**Geraldton.** The port of Geraldton (28°S latitude) is situated in Champion Bay on the west coast, 215 nautical miles in a north-westerly direction from Fremantle. The outer harbour, which is ten metres deep, provides a good holding anchorage and the inner harbour, enclosed by a breakwater, affords ample protection for shipping and shore works. The depth of the inner harbour is 9.4 metres, but the rock base of the entrance channel restricts the loaded draught of vessels to 8.7 metres. With the use of tides vessels may load to 9.1 metres at mean sea level (0.8 m tide), or to 9.3 metres at mean higher high water (1.1 m tide). The port has one berth of 99 metres with depth alongside of 8.8 metres and four berths, lengths 203 metres, 203 metres, 181 metres and 213 metres respectively, with depth alongside of 9.4 metres. The cargo transit shed has a floor area of 2,230 square metres and extensive paved areas are available for open storage of cargo. Bulk grain-loading facilities with a capacity of 800 tonnes per hour serve a terminal of 150,000 tonnes capacity. A conveyor system used for loading minerals has a rated capacity of 1,200 tonnes per hour.

**Port Hedland.** Port Hedland (20°S latitude) is situated on the north-west coast of Western Australia, 957 nautical miles from Fremantle. Access to the harbour is by means of a dredged channel approximately thirteen kilometres in length, 11.8 metres minimum depth and 183 metres wide. The channel, subject to tidal movements, is navigable by vessels drawing up to 17.3 metres. Wharf facilities service five berths. Three privately-owned berths with a total length of 1,039 metres and a depth alongside ranging from 14.8 metres to 17.3 metres are served by three shiploaders, two of them each having a capacity of 6,100 tonnes of iron ore per hour and the third a capacity of 4,570 tonnes per hour. Of the two remaining berths, one is 183 metres in length with a depth alongside of 11.2 metres. It is served by a privately-operated salt-loading facility with a capacity of 1,500 tonnes per hour. The fifth berth is a land-backed general cargo berth 213 metres long with a depth alongside of 11.2 metres.

## RAILWAYS

Railways open for general and passenger traffic in the southern part of the State are operated by the Western Australian Government Railways Commission. The system is linked with railways of other States by the Australian National Railways between Kalgoorlie in Western Australia and Port Pirie in South Australia. There are, in addition, private railways for the haulage of iron ore in the northern part of the State and timber in the south-west.

### Origin and Development

The first railway in the Colony, built in 1871 from Busselton into the nearby forest, was a private line constructed for the transport of timber. By the end of 1900, the Colony had a railway system for general and passenger traffic which comprised 2,181 kilometres of government line and 446 kilometres of privately-owned line. The State Government system reached a maximum of 7,051 kilometres in 1940 but this figure was reduced, particularly during the 1960s, by the closure of certain non-paying lines.

At 30 June 1980 there were 6,504 kilometres of railway open for general and passenger traffic in Western Australia. Of this total, 5,773 kilometres were owned by the State Government and operated by the Western Australian Government Railways Commission, and 731 kilometres were owned by the Commonwealth Government and operated by the Australian National Railways. At the same date private railways used for the transport of iron ore were those between Newman and Port Hedland (430 kilometres), Shay Gap and Port Hedland (180 kilometres), Paraburdoo and Dampier (382 kilometres), and Pannawonica and Cape Lambert (167 kilometres).

### WESTERN AUSTRALIAN GOVERNMENT RAILWAYS (a)

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
<b>FINANCE</b>						
Capital investment at 30 June (b)	\$'000 177,475	\$'000 191,434	\$'000 204,573	\$'000 209,615	\$'000 204,298	\$'000 198,828
Operating revenues —						
Passenger fares	3,954	4,313	4,439	4,541	4,987	5,114
Parcels and mails	2,326	2,780	2,834	2,530	2,377	2,357
Paying goods and livestock	87,009	108,430	113,078	122,418	128,172	143,299
Miscellaneous	15,021	16,788	17,960	21,098	20,431	24,964
Total operating revenues	108,309	132,312	138,311	150,588	155,966	175,735
Operating expenses	96,406	110,893	123,382	140,426	152,627	172,979
Excess of operating revenues over expenses	11,904	21,419	14,928	10,162	3,340	2,755
Depreciation	9,937	10,314	11,085	10,815	10,481	11,240
Interest charges	13,609	14,231	14,936	15,403	16,940	19,534
Total deficit (c)	11,676	3,041	11,129	16,075	24,140	28,033
<b>RAILWAY OPERATIONS</b>						
Route kilometres at 30 June —						
1,067 mm gauge (d)	4,713	4,798	4,787	4,387	4,393	4,396
1,435 mm gauge	1,235	1,233	1,237	1,229	1,229	1,229
Dual gauge	127	132	141	148	148	148
Employees at 30 June	10,102	9,999	10,119	10,065	9,962	9,727
	'000	'000	'000	'000	'000	'000
Number of —						
Train kilometres run (e)	13,812	13,782	13,696	13,441	12,822	12,486
Passenger-journeys —						
Suburban (f)	10,006	9,141	8,016	8,877	8,854	7,132
Country	469	416	414	390	402	418
Total	10,474	9,557	8,430	9,268	9,256	7,550
Tonnes of freight —						
Paying goods and livestock	16,348	17,812	19,003	18,625	19,288	21,388
Departmental (g)	222	439	369	501	433	549
Total	16,570	18,251	19,373	19,126	19,721	21,937
Tonne kilometres —						
Paying goods and livestock	4,269,270	4,548,354	4,532,552	4,273,064	4,178,835	4,730,671
Departmental	41,445	64,899	48,891	49,724	43,009	69,438
Total	4,310,715	4,613,253	4,581,443	4,322,788	4,221,844	4,800,109

(a) Includes details of road services. (b) Including Stores Funds. (c) Actual deficits after adjustment resulting from fluctuations in rates of exchange. (d) Excludes route kilometres of 1,067 mm gauge line which parallels the 1,435 mm gauge line. (e) Revenue and non-revenue train kilometres. (f) Responsibility for the financial and policy direction of the suburban railways passed to the Metropolitan (Perth) Passenger Transport Trust from 1 July 1974. (g) Departmental freight comprises mainly oil, ballast, timber and rails.

### The Western Australian Government Railways Commission

The *Government Railways Act 1904-1980* constituted a Commission, in the person of the Commissioner of Railways, who is responsible, subject to the Minister, for the administration of the Act.

The *Government Railways Act Amendment Act 1978* provides the Railways Commission with statutory authority to borrow funds in its own right, subject to specific approval of the

Treasurer or the Governor. In addition the Act authorises the Commission to engage in such other financial transactions as are appropriate for trading corporations generally in the normal course of business. The payment of interest and the repayment of loans are guaranteed by the Treasurer on behalf of the State.

Previously funds were provided from the General Loan Fund or from the Consolidated Revenue Fund, the financial procedure being basically the same as for other Departments. The loan liability of the Western Australian Government Railways Commission to the Treasury was \$198,828,393 at 30 June 1980, the net decrease during 1979-80 being \$5,469,272.

In addition to its railways services, the Commission operates an extensive system of road services for the carriage of passengers, mail and freight.

Suburban railway passenger services are operated by the Commission on behalf of and at the direction of the Metropolitan (Perth) Passenger Transport Trust under the provisions of the *Metropolitan (Perth) Passenger Transport Trust Act Amendment Act 1973* which came into operation by proclamation on 22 March 1974. The Commissioner of Railways, as provided by the Act, is an *ex-officio* member of the Trust.

Administrative and operational control of suburban railway passenger services remains with the Commissioner of Railways but, as from 1 July 1974, the Trust accepted responsibility for finance and policy direction in terms of the 1973 legislation.

#### WESTERN AUSTRALIAN GOVERNMENT RAILWAYS PAYING GOODS AND LIVESTOCK CARRIED (a)

Freight classification	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes
Wheat	3,294,646	3,499,682	3,051,656	2,996,451	2,671,740	3,167,365
Other grain	370,203	374,033	403,254	385,459	437,133	366,874
Grain products	42,151	34,626	28,568	21,568	18,232	19,156
Fertilisers	501,302	471,525	525,321	453,392	479,035	517,073
Fruit and vegetables	77,505	78,145	62,452	53,335	33,055	32,301
Wool	137,226	147,602	144,935	116,124	127,668	126,030
Timber	293,111	277,976	271,174	220,640	210,355	228,110
Coal, etc.	808,020	1,140,419	1,178,776	1,285,291	1,398,577	1,775,260
Ores and minerals	8,585,118	9,319,702	10,246,562	9,904,469	10,680,043	11,722,418
Oil in tank wagons	396,062	426,022	552,389	404,175	406,626	425,039
Other classifications	1,776,179	1,987,564	2,467,581	2,756,330	2,825,986	3,008,776
Total (b)	16,348,224	17,812,263	19,003,270	18,624,824	19,288,450	21,388,402
Number of livestock carried —						
Sheep	1,073,590	1,037,192	1,219,735	407,447	249,471	339,675
Cattle	51,511	31,967	51,178	24,795	14,637	10,788
Pigs	30,017	16,038	12,280	11,231	7,298	8,074
Horses	492	168	230	196	282	1,318

(a) Includes details of road services. (b) Includes weight of livestock carried.

**Goods and Livestock Carried.** The previous table shows the quantity of paying goods and livestock carried during each year in the period from 1974-75 to 1979-80. The classification used in the table is that adopted by the Railways Commission in dissecting its freight transport statistics.

**Railways Rolling Stock.** The following table shows the number of the various categories of rolling stock of the Western Australian Government Railways in service at 30 June for the years 1975 to 1980.

### WESTERN AUSTRALIAN GOVERNMENT RAILWAYS ROLLING STOCK IN SERVICE AT 30 JUNE

Category	1,067 mm gauge						1,435 mm gauge					
	1975	1976	1977	1978	1979	1980	1975	1976	1977	1978	1979	1980
Locomotives —												
Steam	2	2	2	2	2	2	—	—	—	—	—	—
Diesel	163	163	159	159	169	164	43	43	43	43	43	44
Total	165	165	161	161	171	166	43	43	43	43	43	44
Coaching stock	170	145	140	140	140	131	9	9	9	9	9	9
Goods stock (a)	10,192	9,943	9,720	9,419	9,078	8,778	1,254	1,263	1,262	1,274	1,278	1,278
Service stock (b)	501	431	410	400	385	390	54	24	24	38	85	83

(a) Includes brake vans, goods wagons, livestock wagons, mineral wagons, etc. (b) Includes ballast wagons, workmen's vans, ash disposal wagons, water tanks, etc.

### Iron Ore Railways

In recent years the exploitation of extensive inland deposits of iron ore in Western Australia has necessitated the construction of a number of railways for the transport of ore from the mines to the coast. Conditions applying to the construction and operation of these railways are incorporated in agreements made between the State Government and mining companies and ratified by Act of Parliament.

The following summary relates to railways in use for the transport of iron ore at 30 June 1980. The quantity of ore carried on these railways was 88.4 million tonnes in 1974-75, 81.5 million tonnes in 1975-76, 83.8 million tonnes in 1976-77, 83.3 million tonnes in 1977-78, 77.7 million tonnes in 1978-79 and 89.7 million tonnes in 1979-80. At 30 June 1980 there were 130 locomotives and 5,618 ore wagons in service.

### RAILWAYS USED FOR TRANSPORT OF IRON ORE

Railway	Enabling Act	Length (route kilometres)	Gauge	Date operative (a)
Shay Gap-Port Hedland (b)	No. 97 of 1964 (c)	180	1,435 mm	1966 — 23 May
Paraburdoo-Dampier (b)	No. 24 of 1963 (d)	382	1,435 mm	1966 — 1 July
Koolyanobbing-Kwinana (e)	No. 27 of 1961 (f)	490	1,435 mm	1967 — 10 April
Northam-Wundowie (g)	..	33	1,067 mm	1967 — 10 April
Newman-Port Hedland (b)	No. 75 of 1964 (h)	430	1,435 mm	1969 — 18 January
Pannawonica-Cape Lambert (b)	No. 91 of 1964 (i)	167	1,435 mm	1972 — 6 July

(a) Date on which first load of iron ore was dispatched from mine. (b) Privately owned and operated. (c) *Iron ore (Mount Goldsworthy) Agreement Act 1964*. (d) *Iron Ore (Hammersley Range) Agreement Act 1963*. (e) Part of the Western Australian Government Railways' system; open for general and passenger traffic. (f) *Railways (Standard Gauge) Construction Act 1961*. (g) Part of the Western Australian Government Railways' system; used only for the transport of iron ore from Koolyanobbing to the charcoal iron and steel industry at Wundowie. (h) *Iron Ore (Mount Newman) Agreement Act 1964*. (i) *Iron Ore (Cleveland-Cliffs) Agreement Act 1964*.

### Australian National Railways

The former Commonwealth Railways comprised four separate systems. These were the Trans-Australian Railway, operating partly in Western Australia and partly in South Australia; the Central Australia Railway, partly in South Australia and partly in the Northern Territory; the North Australia Railway, wholly in the Northern Territory; and the Australian Capital Territory Railway. Commonwealth and State legislation was enacted in 1975 to transfer the Tasmanian Government Railways and the non-metropolitan South Australian Railways to the Commonwealth Government. The Australian National Railways Commission came into existence on 1 July 1975 to control the two transferred systems and the former Commonwealth Railways. Services operating on the North Australia Railway were withdrawn from 30 June 1976. On 1 March 1978 the Australian National Railways Commission assumed full control of the non-urban South Australian State railways and the Tasmanian Government railways. Details of the operations of the non-urban South Australian railways and the Tasmanian railways are included in particulars shown for the National railway system. The

State Transport Authority operates urban rail services in South Australia and particulars of these are shown as the South Australian railway system.

### GOVERNMENT RAILWAYS IN AUSTRALIA — SUMMARY OF OPERATIONS: 1978-79

Railway system of —	Route kilometres at 30 June	Revenue train kilometres run	Passenger-journeys	Goods and livestock carried	Gross earnings	Average number of employees (a)
State Governments —		'000	'000	'000 tonnes	\$'000	
New South Wales	9,820	55,622	182,749	33,482	379,033	42,765
Victoria	6,184	30,856	93,323	11,190	192,656	23,277
Queensland	9,789	32,100	27,275	36,542	310,418	24,667
South Australia	142	3,957	70,526	—	(b)24,550	(b)(c)3,790
Western Australia	5,770	12,068	(d)234	19,288	154,597	9,713
Commonwealth Government —						
National	7,683	12,918	677	10,623	131,829	11,049
Australia	39,388	147,520	374,785	111,125	1,193,083	115,140

(a) Excluding construction staff except for Victoria where construction staff are included. (b) Includes details for combined rail, bus and train operations. Separate details for rail are not available. (c) Includes staff on loan from, and paid by, the Australian National Railways Commission. (d) Excludes suburban rail passenger-journeys, which are operated under the direction of the Metropolitan (Perth) Passenger Transport Trust.

It will be noted that particulars of route kilometres shown for all State systems except Queensland differ from the details given for those States in the table in the next section *Railway Gauges*, which is compiled according to the State or Territory in which the several lengths of line are situated.

### Railway Gauges

The next table shows route kilometres of government railways of each gauge in each of the Australian States and Territories at 30 June 1979.

A summary providing a brief history of the standardisation of gauges on major trunk routes between Perth and Sydney appears in *Western Australian Year Book*, No. 16 — 1977 (pages 460-1) and earlier issues.

### GOVERNMENT RAILWAYS IN EACH STATE AND TERRITORY OF AUSTRALIA ROUTE KILOMETRES OPEN AT 30 JUNE 1979

State or Territory	Route kilometres of gauge —			Total route kilometres
	1,600 mm	1,435 mm	1,067 mm	
New South Wales	(a) 328	(b) 9,820	—	10,148
Victoria	5,531	(c) 325	—	5,856
Queensland	—	111	9,678	9,789
South Australia	(d) 2,537	1,871	1,814	6,222
Western Australia	—	2,108	(e) 4,393	6,501
Tasmania	—	—	864	864
Australian Capital Territory	—	8	—	8
Total route kilometres	8,396	14,243	16,749	39,388

(a) Part of the Victorian railway system. (b) Includes 47 kilometres of the A.N.R. System between Cockburn and Broken Hill. (c) Includes 12 kilometres of 1,435 mm/1,600 mm dual gauge line operating in the Melbourne metropolitan area. (d) Includes 142 kilometres of the Adelaide metropolitan railway system operated by the State Transport Authority. (e) Excludes 148 kilometres of 1,435 mm/1,067 mm dual gauge line which is included in the figure shown for the 1,435 mm gauge line.

### ROADS AND ROAD TRAFFIC

Work connected with road construction and maintenance and associated projects in Western Australia is undertaken by the State Government, through the Main Roads Department, and by local government authorities, comprising City Councils, Town Councils and Shire Councils.

Under the provisions of the Main Roads Act, the Main Roads Department was established in 1930 to replace the Main Roads Board originally constituted as a central road authority in 1926. The Department operates under the *Main Roads Act 1930-1980* and is administered by a Commissioner of Main Roads responsible to the Minister for Works. The Act was amended in

1975 to introduce from 1 July 1976, a new road classification system ranking roads in order of 'highways', 'main roads' and 'secondary roads', thus bringing the terminology in the Act more into line with the functional classifications accepted by the National Association of Australian State Road Authorities. The previous concept of a 'controlled-access' road has been replaced by the power to declare 'control of access' over section or part of, highways and main roads.

Main roads are those which provide communication between a large producing area, either actual or potential, and its market or nearest port or railway station; between two or more such areas; between large centres of population; or between the capital city and a large producing area or a large centre of population. Highways are defined similarly to main roads but represent a higher functional category. The new secondary road classification applies to many of the roads previously known as important secondary roads together with some of the more important of the roads formerly designated developmental roads. The Act provides that, on the recommendation of the Commissioner, any road may be declared by the Governor to be, or cease to be a highway, main road or secondary road.

The construction and maintenance of highways and main roads are the responsibility of the Main Roads Department. The Department also makes substantial financial provision for the construction and maintenance of secondary roads. In addition the Main Roads Act provides that the Commissioner may allocate funds for the construction or improvement of unclassified roads, which are roads of less importance than highways, main roads and secondary roads. The construction and maintenance of strategic roads and roads of access to Commonwealth property is undertaken by the Department for the Commonwealth Government.

Within its own district, each local government authority is responsible for the provision and upkeep of roads other than those provided by the Main Roads Department. In addition, the local authority is required by the Main Roads Act to maintain any secondary road situated in its district.

The following table, derived from data provided by the Main Roads Department, shows the length of public roads open for vehicular traffic at 30 June 1979, classified according to statistical division. Included in the total are 7,721 kilometres of highways, 7,581 kilometres of main roads and 8,740 kilometres of secondary roads. Excluded from the table are 23,558 kilometres of road under the control of the Forests Department, comprising 116 kilometres sealed, 5,618 kilometres gravel and formed and 17,824 unformed.

ROADS OPEN FOR VEHICULAR TRAFFIC AT 30 JUNE 1979  
CLASSIFIED ACCORDING TO STATISTICAL DIVISION  
(Kilometres)

Statistical division	Formed roads			Total	Unformed roads (b)	Grand total
	Sealed or primed	Gravel surface	Formed only (a)			
Perth Statistical Division	7,881	493	297	8,672	225	8,896
Other statistical divisions —						
South-West	4,496	3,528	1,883	9,907	817	10,724
Lower Great Southern	2,841	3,851	4,037	10,729	1,704	12,433
Upper Great Southern	3,071	4,530	5,811	13,411	961	14,372
Midlands	7,392	9,940	9,638	26,971	2,214	29,184
South-Eastern	2,851	4,239	4,558	11,649	6,067	17,716
Central	4,198	4,822	12,503	21,523	7,728	29,252
Pilbara	1,203	684	3,904	5,791	1,776	7,567
Kimberley	1,295	1,509	3,380	6,184	1,472	7,656
Total	27,348	33,103	45,714	106,165	22,739	128,904
WESTERN AUSTRALIA	35,229	33,596	46,011	114,836	22,964	137,800

(a) Comprises roads, mainly of natural surfaces, formed but not metalled or otherwise prepared. (b) Roads, unprepared except for certain clearing, used for vehicular traffic.



### Vehicle Registration, Licences and Traffic Control

Prior to 1973, the registration of motor vehicles under the provisions of the *Traffic Act 1919-1974* was shared between the Police Department and local government authorities. The Police Department was responsible for the issuing of motor driver's licences throughout the State.

With the passage of the *Acts Amendment (Road Safety and Traffic) Act 1973*, responsibility for motor drivers' licences passed to a new organisation, the Department of Motor Vehicles, which also controlled the registration of vehicles except in those local government areas where registration functions had not been voluntarily relinquished to the Department.

The *Road Traffic Act 1974-1980*, which came into operation on 1 June 1975, repealed the *Traffic Act 1919-1974*, consolidated and amended the law relating to road traffic and established the Road Traffic Authority. The Department of Motor Vehicles was abolished from the same date and its functions were taken over by the Authority. Registration of motor vehicles is presently the responsibility of the Road Traffic Authority but at 31 December 1980 forty-nine local authorities continued to act as agents of the Authority. Traffic control in general (except for certain powers in relation to the parking of vehicles) is also the responsibility of the Road Traffic Authority.

Persons who have not previously held a driver's licence under the Act are issued with a probationary licence, the period of probation being one year. At the end of this period the probationary licence becomes an ordinary licence. Persons who have previously held a licence in a place outside the State are issued with an ordinary licence provided that the previous licence had been held for a period of one year.

The Act provides that the Road Traffic Authority may suspend or cancel a driver's licence under certain conditions, one of them being the number or nature of the convictions under the Act or its Regulations.

A more detailed account of events preceding the creation of the Road Traffic Authority appears in the *Western Australian Year Book*, No. 14 — 1975.

The Authority comprises seven members, namely the Commissioner of Main Roads; the Commissioner of Police; the Director General of Transport (or their respective deputies); three persons appointed by the Governor to represent, respectively, the Local Government Association of Western Australia, the Country Shire Councils' Association of W.A., and the Country Town Councils' Association and the permanent head of the Authority appointed under and subject to the *Public Service Act 1978-1980*.

In addition to vehicle registration and the licensing of drivers of motor vehicles, the Authority is charged with responsibility for the collection and analysis of road traffic statistics and the undertaking of research into the causes and prevention of road accidents. In discharging its functions under the Act, the Authority is required, *inter alia*, to maintain a comprehensive knowledge of significant developments in traffic administration and research projects conducted elsewhere and to achieve the most efficient use of resources by eliminating duplication of work performed by any other body or authority, whether established within the State or elsewhere.

Section 231 of the *Local Government Act 1960-1980* authorises local authorities to make by-laws in relation to the parking of vehicles and, in the case of the Perth City Council, certain powers in this regard are granted in terms of the *City of Perth Parking Facilities Act 1956-1976*.

## MOTOR VEHICLES ON REGISTER (a) AND RATIO TO POPULATION

At 31 December —	Motor cars and station wagons ( <sup>000</sup> )	Light and heavy commercial, omnibuses ( <sup>000</sup> )	Motor cycles and scooters ( <sup>000</sup> )	Total ( <sup>000</sup> )	Estimated number of vehicles per 1,000 of population		Estimated number of persons per vehicle	
					Motor cars and station wagons	All motor vehicles (a)	Motor cars and station wagons	All motor vehicles (a)
PERTH STATISTICAL DIVISION								
1974	299.2	63.0	14.9	377.1	378	477	2.6	2.1
1975	317.0	68.8	16.4	402.2	391	496	2.6	2.0
1976	340.9	75.3	17.1	433.3	410	521	2.4	1.9
1977	362.1	83.1	17.3	462.5	423	540	2.4	1.9
1978	379.0	89.1	16.9	484.9	434	555	2.3	1.8
1979	393.2	92.0	17.5	502.6	440	562	2.3	1.8
WESTERN AUSTRALIA (b)								
1974	400.0	114.9	23.0	537.9	352	473	2.8	2.1
1975	424.3	136.3	27.2	587.8	366	507	2.7	2.0
1976	455.6	147.7	28.2	631.5	385	534	2.6	1.9
1977	488.3	159.3	28.2	675.8	403	558	2.5	1.8
1978	508.1	168.6	27.4	704.1	413	572	2.4	1.8
1979	526.5	174.2	27.8	728.5	420	581	2.4	1.7

(a) Excludes tractors, trailers, caravans, and plant and equipment such as bulldozers, road graders and rollers, and mobile cranes.

(b) Includes Commonwealth Government-owned vehicles (other than those of the defence services) listed with the Commonwealth Motor Vehicle Registry, Canberra. At 31 December 1979 there were in Western Australia 3,031 such vehicles comprising 345 motor cars, 650 station wagons, 1,144 utilities and panel vans, 586 trucks, 32 omnibuses and 274 motor cycles.

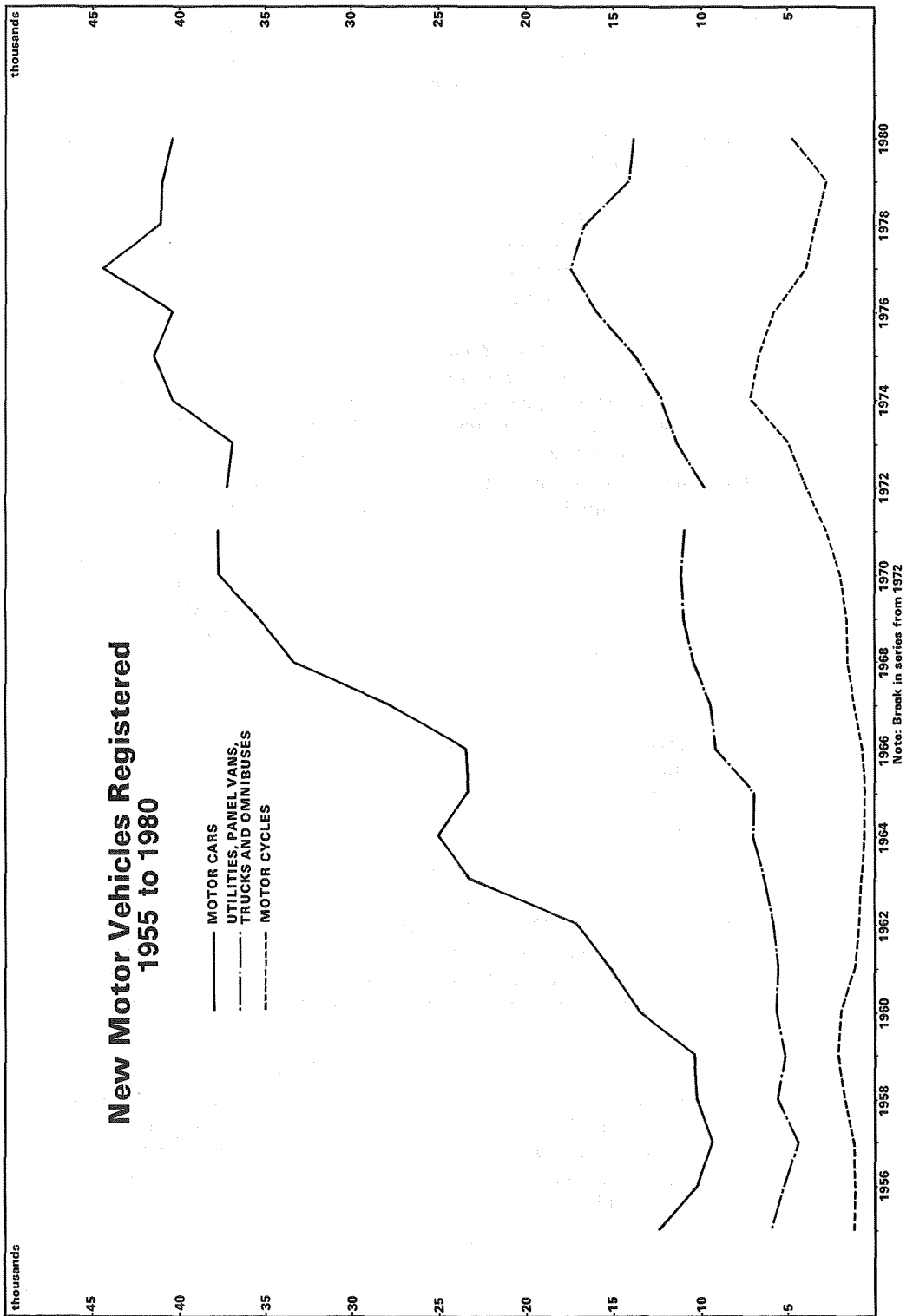
The table shows the number of motor vehicles, classified according to type, on register in the Perth Statistical Division (see map inside back cover) and in the whole of Western Australia from 1974 to 1979. Vehicles owned by the Commonwealth Government are not licensed under the Traffic Act but are included in the figures. The table also gives the estimated number of vehicles per 1,000 of population and the number of persons per vehicle.

### Finance for Roads

The principal source of revenue for road works in Western Australia is in the form of Commonwealth Government financial assistance authorised by a series of Acts, the first of which, the Main Roads Development Act, was passed in 1923. For the three years 1977-78 to 1979-80, assistance totalling \$1,529 million was provided to the States for road construction and maintenance, under the *States Grants (Roads) Act 1977* as amended. The legislation currently in operation for the provision of grants to the States for or in connection with roads are the *Roads Grants Act 1980* and the *Transport Planning and Research (Financial Assistance) Act 1977*.

The *Roads Grants Act 1980* provides grants to the States for approved expenditures on national and developmental roads, urban arterial roads, rural arterial roads and local roads. Over the five years 1980-81 to 1984-85, the Commonwealth is to provide \$3,650 million to the States and the Northern Territory as grants for road construction and maintenance. Of this amount, \$606.9 million will be provided to the States in 1980-81. Western Australia's share of the total in 1980-81 is estimated to amount to \$76.9 million. For national and developmental roads, the Act authorises grants totalling \$277.5 million for 1980-81 of which \$29.1 million is allocated to Western Australia. For the other three categories of roads, Western Australia's share of the total grant of \$350.5 million for 1980-81 is \$47.8 million comprising \$12.0 million for rural arterial roads, \$14.3 million for urban arterial roads and \$21.4 million for local roads. Payment of moneys provided by the *Roads Grants Act 1980* is contingent on a State's expenditure on roads from its own resources. To qualify for the full amount of the grant in 1980-81 Western Australia's 'quota' to be spent on road works amounted to \$51.2 million.

The *Transport Planning and Research (Financial Assistance) Act 1977* authorises the Commonwealth Government to grant financial assistance to the States for approved projects of



planning and research in relation to land transport. The Act applies to the year commencing on 1 July 1977 or any succeeding year and provides for the States to bear a proportion of the costs of projects. Of \$6.9 million allocated to the States for 1979-80, Western Australia's share amounted to \$0.65 million.

Western Australian Acts which provide for a system of receipt and disbursement of moneys for road purposes are the *Road Traffic Act 1974-80*, the *Transport Act 1966-1980*, and the *Main Roads Act 1930-1980*.

The *Road Traffic Act 1974-1980* provides for payment to the Main Roads Trust Account, maintained under the Main Roads Act, of all fees received for the issue, renewal and transfer of motor vehicle licences (other than recording fees) and for the issue of excess load permits. In addition, one-half of the fees received on the issue or renewal of drivers' licences are paid to the Account.

In conjunction with the repeal of the *Road Maintenance (Contribution) Act 1965-1978*, the *Transport Commission Act 1966-1979*, was amended to provide for licence fees to be paid by businesses engaged in the wholesaling of petroleum products. Enabling legislation was authorised in May 1979 by the *Acts Amendment and Repeal (Road Maintenance) Act 1979*, which also provides for such licence fees to be paid to the Main Roads Trust Account.

The *Main Roads Act 1930-1980* provides for payment to the Main Roads Trust Account of moneys received from the Australian Government as financial assistance in relation to roads; amounts payable under the provisions of the Traffic Act or any other Act; moneys appropriated by the Parliament; and payments by local government authorities in respect of permanent works and the maintenance of main roads and developmental roads. Moneys standing to the credit of the Account are used to meet expenditure by the Commissioner of Main Roads on the administration of the Act and the construction of roads and associated works, and to provide funds to local government authorities for roads and road works.

The *Main Roads Act Amendment Act 1980* established a system of grants to local government authorities for each of the three financial years during the period ending 30 June 1983. The Act allocates each local government authority to one of five groups and provides for payment of a base grant to each local government authority for road construction and maintenance, and for payments of additional grants for approved programmes. The conditions relating to matching expenditures and, where applicable, to additional grants vary according to the groups. The total amount available to local government authorities in 1980-81 was \$21.4 million. In addition, a provision of the *Main Roads Act Amendment Act 1975* empowers the Commissioner of Main Roads to borrow money for the purpose of road construction and associated activities, subject to the approval of the Minister.

Grants payable from the Main Roads Trust Account are an important source of funds available to local government authorities for road construction and maintenance. Other moneys may be provided from the ordinary revenue of a local authority or from loans raised for road purposes.

#### ROAD PASSENGER TRANSPORT SERVICES

Motor omnibus services (as well as a passenger ferry service) in the metropolitan area are operated by the Metropolitan (Perth) Passenger Transport Trust, constituted under the *Metropolitan (Perth) Passenger Transport Trust Act 1957-1980*. For the purposes of the Act, the metropolitan area is defined by a proclamation of 6 June 1973 as being 'all the land within a circle having a radius of 50 kilometres from the Perth Town Hall' and in addition, an area bounded by the South-Western Highway and the ocean, extending southward to an east-west line 1.6 kilometres south of the town of Pinjarra.

Details of the operations of government and municipal omnibus services in Western Australia during the six years ended 30 June 1980 are given in the following table.

## OMNIBUS SERVICES (a)

Year	Route kilometres operated (b)	Omnibuses at end of year	Omnibus kilometres run '000	Passenger-journeys '000	Employees at end of year	Operating revenues (c) \$'000	Operating expenses \$'000	Depreciation \$'000	Interest \$'000
METROPOLITAN (PERTH) PASSENGER TRANSPORT TRUST									
1974-75	1,374	792	37,612	58,723	1,923	11,942	19,478	905	800
1975-76	1,402	818	38,142	59,514	1,950	11,933	21,665	948	793
1976-77	1,433	835	38,451	57,259	2,007	14,096	25,298	1,129	792
1977-78	1,452	853	38,785	56,736	2,047	13,875	27,859	1,323	1,055
1978-79	1,477	864	38,701	53,489	2,031	14,287	29,533	1,540	1,117
1979-80	1,515	896	41,012	55,903	2,097	14,972	37,205	1,682	1,105
WESTERN AUSTRALIAN GOVERNMENT RAILWAYS									
1974-75	6,971	51	2,678	149	147	878	1,309	100	48
1975-76	6,200	49	2,821	154	139	940	1,467	83	24
1976-77	6,916	48	2,675	163	137	988	1,473	64	19
1977-78	6,916	50	2,711	157	136	1,111	1,649	58	15
1978-79	6,956	47	2,834	173	137	1,370	1,784	121	69
1979-80	7,011	45	2,894	190	136	1,549	2,102	104	61
THE EASTERN GOLDFIELDS TRANSPORT BOARD									
1974-75	29	18	709	514	17	167	188	21	—
1975-76	29	17	590	617	20	196	211	21	—
1976-77	28	20	674	608	25	287	298	29	—
1977-78	45	20	675	626	25	378	347	36	—
1978-79	45	22	512	626	21	411	374	52	—
1979-80	45	21	619	552	22	471	434	81	—

(a) Excludes tourist services.

(b) Excludes school bus routes.

(c) Passenger fares and subsidies only.

Road transport of passengers outside the metropolitan area is provided by the railways road services which cover long-distance routes between Perth and country centres and by The Eastern Goldfields Transport Board, which serves the Kalgoorlie-Boulder urban area under an agreement with the Kalgoorlie and Boulder local government authorities. In addition, at 30 June 1980 private operators, employing 500 buses, were licensed to provide tourist, town, area and charter services.

In certain country areas, children are taken to and from school by motor bus at government expense. In 1979-80 the cost to the Government of school transport services was \$12,292,813. The number of omnibuses engaged was 783. Each day they travelled a total of 87,777 kilometres and carried 25,191 children.

## MOTOR VEHICLE USAGE

A survey conducted by the Australian Bureau of Statistics throughout Australia in late 1979 collected data on motor vehicle usage relating to the twelve months ended 30 September 1979. This survey was similar to others carried out in 1963, 1971 and 1976.

The survey was based on a sample of approximately 57,000 vehicles, of which some 75 per cent were trucks and other commercial types in order to ensure adequate representation of the various types in this diverse sector.

Because the survey results are based on a sample, representing some 7.4 million vehicles on register at 30 September 1979, they are subject to sampling variability when compared with results which would have been obtained from a complete census of all registered motor vehicles using the same questionnaires and procedures.

Results of the survey showed, in Western Australia, an average annual distance travelled of 16,200 kilometres for all vehicles. Cars and station wagons averaged 15,900 kilometres, while articulated trucks averaged 51,800 kilometres.

Detailed information appears in the publication *Survey of Motor Vehicle Usage, twelve months ended 30 September 1979*, (Catalogue No. 9208.0), published by the Australian Statistician, Canberra.

## ROAD TRAFFIC ACCIDENTS

Statistics of road traffic accidents are prepared from information concerning accidents in public thoroughfares, as reported to officers of the Road Traffic Authority or police officers. Accidents involving casualties are those which result in the death of any person within a period of thirty days after the accident, or in which any person suffers bodily injury to an extent requiring surgical or medical treatment.

The accompanying table shows, for each year during the period 1974 to 1979, the number of accidents involving casualties which occurred in Western Australia and the total for Australia as whole. From August 1977, a new road traffic accident report form was introduced in Western Australia. As a result of changed question formats and collection procedures, 'casualty accident' and 'persons injured' statistics include some cases, that would previously have been excluded where the persons injured did not require surgical or medical treatment. As 1977 statistics include accident reports derived from both the old and new methods, details for the year are not comparable with either earlier or later years.

ROAD TRAFFIC ACCIDENTS INVOLVING CASUALTIES  
WESTERN AUSTRALIA AND AUSTRALIA

Particulars	1974	1975	1976	1977 (a)	1978	1979
WESTERN AUSTRALIA						
Accidents involving casualties —						
Total	4,742	5,104	5,287	6,224	7,513	7,025
Per 10,000 motor vehicles on register	91	90	87	r 96	109	98
Per 100,000 of mean population (b)	424	445	452	520	615	565
Number of persons killed —						
Total	334	304	308	290	345	279
Per 10,000 motor vehicles on register	6	5	5	4	5	4
Per 100,000 of mean population (b)	30	26	26	24	28	22
Number of persons injured —						
Total	6,277	6,832	7,059	8,353	10,069	9,342
Per 10,000 motor vehicles on register	120	121	117	r 128	146	131
Per 100,000 of mean population (b)	562	596	603	698	824	751
AUSTRALIA						
Accidents involving casualties —						
Total	67,473	65,788	64,282	67,549	71,045	67,014
Per 10,000 motor vehicles on register	113	105	98	99	99	91
Per 100,000 of mean population (b)	496	478	462	480	499	465
Number of persons killed —						
Total	3,572	3,694	3,583	3,578	3,705	3,508
Per 10,000 motor vehicles on register	6	6	5	5	5	5
Per 100,000 of mean population (b)	26	27	26	25	26	24
Number of persons injured —						
Total	91,338	89,499	87,808	91,616	96,962	91,793
Per 10,000 motor vehicles on register	153	142	134	134	135	125
Per 100,000 of mean population (b)	672	650	631	651	680	636

(a) See section 'Road Traffic Accidents'.

(b) Based on latest available population figures.

The total number of persons killed in road traffic accidents in Australia in 1980 was 3,278 with 293 of the fatalities occurring in Western Australia.

In the next table road traffic accident casualties which occurred in Western Australia during the six years ended 31 December 1979 are classified according to type of road user. The figures shown in the category 'Other' refer to such persons as bystanders, train drivers, riders of horses and drivers of animal-drawn vehicles.

### ROAD TRAFFIC ACCIDENTS CASUALTIES ACCORDING TO TYPE OF ROAD USER

Type of road user	1974	1975	1976	1977	1978	1979
PERSONS KILLED						
Drivers of motor vehicles	119	122	107	93	131	106
Motor cyclists (a)	43	24	32	27	25	30
Pedal cyclists	1	7	7	10	7	4
Passengers —						
Pillion	4	3	5	6	6	2
Other	100	91	96	95	103	74
Pedestrians	65	52	59	58	56	55
Other	2	5	2	1	17	8
Total	334	304	308	290	345	279
PERSONS INJURED						
Drivers of motor vehicles					4,425	4,260
Motor cyclists (a)					758	707
Pedal cyclists					168	241
Passengers —						
Pillion					151	128
Other					3,466	3,174
Pedestrians					602	593
Other					499	239
Total					10,069	9,342

(a) Includes riders of motor scooters.

The following table gives a classification of casualties according to the ages of persons killed and persons injured during each year of the period from 1974 to 1979.

### ROAD TRAFFIC ACCIDENTS — CASUALTIES CLASSIFIED ACCORDING TO AGE

	Age last birthday (years)										
Year	0-4	5-6	7-16	17-20	21-29	30-39	40-49	50-59	60 and over	Not stated	Total
PERSONS KILLED											
1974	11	1	28	78	71	35	27	31	52	—	334
1975	15	4	29	64	58	38	36	18	42	—	304
1976	7	5	29	71	56	42	23	27	46	2	308
1977	13	4	30	47	75	27	24	24	44	2	290
1978	14	6	35	75	76	36	22	25	52	4	345
1979	6	5	25	54	74	38	19	15	43	—	279
PERSONS INJURED											
1974	Figures are not comparable with those for 1978 and 1979.										
1975	See section 'Road Traffic Accidents'.										
1976											
1977											
1978	200	102	927	2,117	2,304	1,091	711	529	607	1,481	10,069
1979	186	106	909	1,982	2,212	1,058	721	535	549	1,084	9,342

Road traffic accidents during the year ended 31 December 1979 are classified in the next tables according to nature of accident and type of traffic unit involved.

### ROAD TRAFFIC ACCIDENTS — NATURE OF ACCIDENT

Nature of accident	1979		
	Accidents involving casualties	Casualties	
		Persons killed	Persons injured
Vehicle to vehicle collisions —			
On carriageway —			
Vehicles in traffic	3,814	86	5,339
Vehicles parked	216	2	253
Single vehicle accidents —			
On carriageway —			
Struck object	54	—	87
Struck pedestrian	623	50	608
Struck animal	69	2	83
Passenger accident	59	1	60
Overturning	125	7	150
Off carriageway —			
Without colliding	587	41	847
Struck object	1,155	71	1,509
Struck vehicle	23	1	36
Struck animal	1	—	1
Struck bystander	27	3	28
Other accidents	272	15	341
Total	7,025	279	9,342

### ROAD TRAFFIC ACCIDENTS — TYPE OF UNIT INVOLVED

Type of unit	1979		
	Units involved (a)	Casualties	
		Persons killed	Persons injured
Motor car	7,244	119	5,433
Station wagon	1,365	23	946
Utility	575	16	395
Panel van	597	8	414
Truck	266	6	101
Semi-trailer	95	5	42
Bus	113	1	84
Tractor	4	—	1
Motor cycle or scooter, moped	821	32	835
Pedal cycle	308	5	285
Railway vehicle	15	—	1
Pedestrian	716	55	584
Trailer, caravan	131	—	7
Animal, animal-drawn vehicle	7	—	6
Other	179	4	96
Not stated	323	5	112
Total	12,759	279	9,342

(a) The number of each type of unit involved in casualty accidents.

For additional information on road traffic accidents in this State, the reader is referred to the publication *Road Traffic Accidents involving Casualties* issued quarterly (Catalogue No. 9401.5) and annually (Catalogue No. 9402.5) by the Western Australian Office of the Australian Bureau of Statistics.

### PASSENGER FERRY SERVICE

The Metropolitan (Perth) Passenger Transport Trust operates a passenger ferry service across the Swan River from Perth to South Perth and makes boats available for charter. Particulars of private charter excursions, other than those which relate to operating revenues and expenses, are excluded from the figures in the following table which gives a summary of operations over the period 1974-75 to 1979-80.



## PASSENGER FERRY SERVICE

Year	Ferries at end of year	Kilometres run (a)	Passenger- journeys (a)	Employees at end of year	Operating revenues	Operating expenses	Deprecia- tion	Interest
					\$	\$	\$	\$
1974-75	5	35,756	353,924	10	110,602	127,398	4,974	10,209
1975-76	5	36,456	372,778	10	121,728	138,570	5,099	10,840
1976-77	5	38,158	342,077	11	134,929	140,753	5,346	8,910
1977-78	5	40,098	336,407	11	158,866	160,745	4,646	6,630
1978-79	5	39,214	309,378	10	206,551	181,686	5,218	7,400
1979-80	5	39,708	336,718	10	209,612	199,139	5,922	7,500

(a) Excludes private charter operations.

## AIR TRANSPORT

The supervision and control of civil air transport throughout Australia is the responsibility of the Commonwealth Department of Transport. Its regulatory functions include the licensing of air crew, engineering staff, airlines, charter and aerial work operators, flying schools and aerodromes; and the establishment and operation of air traffic control procedures. The Federal Minister for Transport has the responsibility for the approval of fares and freight rates. The Department is responsible for the conduct of search and rescue operations; the determination of air rules and enforcement of safety regulations; the setting of requirements for and the issue of certificates of airworthiness for all civil aircraft; the provision and maintenance of government aerodromes, aeronautical communication systems and radio navigational aids; and the specification of required meteorological services. It also co-operates with the State Transport Commission which has a statutory licensing function in respect of air transport facilities within the State.

An extensive system of regular air services operates in Western Australia for the transport of passengers, freight and mail. At 1 March 1981 the International Airport, twelve road kilometres from central Perth, was used by:

- (i) eight international operators providing regular jet services to and from Africa, Europe, India, Indonesia, Malaysia, the Middle East, Singapore, Hong Kong and Thailand;
- (ii) two interstate operators providing up to eight jet services per day between Perth and other Australian capital cities;
- (iii) one intrastate operator providing frequent jet services to eleven other towns in Western Australia and to three towns in the Northern Territory; and
- (iv) commuter operators connecting Perth with twenty-two country centres.

Other commuter services connect thirty-five townships and stations with ports on jet routes.

During the past ten years the average annual passenger traffic growth at Perth Airport has exceeded 10 per cent.

In addition to the aircraft capacity provided by airline and commuter operators there is a large fleet of light aircraft available for charter work and all kinds of aerial work including aerial surveys, spotting, aerial agriculture, etc. This fleet which includes executive twin-jet type aircraft and helicopters numbered 284 on 1 January 1981 when there were another 444 private (non-commercial) aircraft based in Western Australia.

Perth Airport is equipped with modern electronic and electrical navigation and approach aids to enable operations in periods of low visibility, and thirteen airports in the State have been equipped with visual approach slope indicator lighting systems to permit regular jet operations at those ports. There are ten flight service and three air traffic control establishments at various ports throughout Western Australia.

On 1 March 1981 the Commonwealth Government owned and maintained twenty aerodromes in Western Australia and there were twenty-eight licensed aerodromes owned

privately or by local authorities. Strips suitable for use by light aircraft and scattered throughout the State were estimated to exceed 1,000 in number. The Royal Flying Doctor Service, which has occasion to operate to and from many of those strips, has a number of bases in Western Australia and details of its activities are given in Chapter V, Part 3.

**Airport Operations.** The following table, compiled from information published by the Commonwealth Department of Transport, provides a summary of civil air transport operations at principal airports in Western Australia during each of the years 1977 to 1979. The figures refer only to regular public transport operations on scheduled services by licensed airlines and exclude charter and commuter services. Commuter service is a term used to describe regular flights by charter firms with small aircraft operating to fixed and published timetables.

#### CIVIL AIR TRANSPORT — TRAFFIC HANDLED AND AIRCRAFT MOVEMENTS AT PRINCIPAL AIRPORTS

Airport	Passengers (a)			Freight (tonnes) (b)			Aircraft movements (c)		
	1977	1978	1979	1977	1978	1979	1977	1978	1979
Broome	20,763	19,967	23,158	323	286	311	1,803	1,734	1,866
Carnarvon	14,505	15,182	16,625	86	105	123	977	1,092	1,228
Derby	25,923	27,277	29,097	824	873	838	2,611	2,354	2,210
Geraldton	33,634	34,414	32,382	126	110	94	1,715	1,758	1,680
Kalgoorlie	29,668	29,667	29,274	185	188	178	756	865	835
Karratha	48,671	58,996	58,971	877	883	784	2,667	2,858	3,092
Kununurra	18,002	20,753	22,421	451	480	470	1,412	1,340	1,498
Learmonth	7,018	8,059	13,479	66	81	99	636	677	1,066
Newman	25,210	29,929	25,894	266	356	338	1,639	1,713	1,732
Paraburdoo	29,252	39,445	26,740	634	669	509	1,815	2,024	1,936
Perth —									
Internal (d)	746,240	815,000	879,113	12,707	13,970	13,330	11,964	13,085	13,013
International	206,200	225,300	261,182	3,300	3,400	4,427	3,237	3,691	3,309
Port Hedland	61,009	66,274	69,098	2,189	2,281	2,757	3,661	4,054	4,051

(a) Total of embarkations and disembarkations. (b) Total of freight loaded and unloaded. (c) Total of arrivals and departures. (d) Interstate and intrastate.

**Casualty Accidents.** The following table shows the number of accidents involving civil aircraft which resulted in death or serious injury.

#### CIVIL AIR TRANSPORT — ACCIDENTS INVOLVING CASUALTIES (a)

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
WESTERN AUSTRALIA						
Number of —						
Accidents (a)	3	3	6	6	3	8
Persons killed	1	6	—	10	1	7
Persons seriously injured	2	1	9	3	4	9
AUSTRALIA						
Number of —						
Accidents (a)	24	32	33	47	43	48
Persons killed	25	54	39	58	42	50
Persons seriously injured	16	24	24	27	37	44

(a) Accidents involving civil aircraft which resulted in death or serious injury. Excludes parachutists killed on contact with earth after an uninterrupted fall. Excludes accidents outside Australia involving aircraft on the Australian register.

The statistics relate to the following classes of operation: regular public transport; charter flights; aerial agriculture; training; other aerial work; private; and gliding.

#### TRANSPORT CO-ORDINATION

##### State Transport Co-ordination Act

The *State Transport Co-ordination Act 1966*, which came into operation on 19 June 1967, repealed the *State Transport Co-ordination Act 1933-1961*. The Act provided for the appointment of a Director General of Transport, a Transport Advisory Council and a Transport Users' Board.

The duties of the Director General are to recommend to the Minister transport policy or changes in transport policy and measures for achieving policy objectives and the co-ordination of the various forms of transport service; to implement such policies and measures; to provide for research in transport planning and operation and in the economics of every form of transport; to co-ordinate capital works programmes for public transport services; to inquire into existing transport services; to recommend the provision of road transport services; to examine and report on any proposal for the construction of a new railway; to recommend the closure or partial suspension of any transport service, including a railway; and to advise the Minister on the administration of specified Acts relating to transport.

The Transport Advisory Council comprises the Director General of Transport (as Chairman), the Commissioner of Railways, the Commissioner of Main Roads, the Commissioner of Transport, the Chairman of the Metropolitan (Perth) Passenger Transport Trust, the Chairman of the Western Australian Coastal Shipping Commission, a representative of the West Australian Road Transport Association, and a representative of operators of regular air transport services. The duties of the Council are to formulate proposals in respect of, and make recommendations on, any matter referred to it by the Minister or the Director General of Transport, or that it may bring forward of its own motion.

The Transport Users' Board consists of the Director General of Transport (as Chairman) and four persons appointed by the Governor on the nomination of the Minister. These four members must be persons who, in the opinion of the Minister, are capable of assessing the financial and economic effect on transport users of any proposed or existing transport policy, two of them being persons particularly versed in the transport needs of rural industries. The Transport Users' Board is charged with the duty of considering and, where it so resolves, of making recommendations on, any matter affecting a transport service operating in the State, or concerning the lack or inadequacy of a transport service.

### **Transport Act**

The *Transport Act 1966-1980* provides for the appointment of a Commissioner of Transport, who, under the direction of the Minister, is required to call tenders for the provision of transport services; to administer and direct the payment of subsidies with respect to the provision of transport as may be authorised under the Act; to consider and determine all applications for licences in respect of the transport of passengers and goods by road, rail, air and sea; to conduct such investigations, enquiries, study or research as he considers necessary or desirable, on matters related to the operational and economic stability of the transport industry in this State; to enquire into and recommend the minimum rates of remuneration payable in respect of the operations of commercial goods vehicles pursuant to sub-contracts; and to consider and determine all applications for licences in respect of persons who carry on the business of selling petroleum products.

Vehicles required to be licensed by the Commissioner under the Act are omnibuses, other than those operated by the Metropolitan (Perth) Passenger Transport Trust; commercial goods vehicles; aircraft, other than those operated solely in connection with the Royal Flying Doctor Service; and ships, other than those operated by the Western Australian Coastal Shipping Commission.

Financial transactions are recorded in a Transport Commission Fund as required by the Act. The principal revenues of the fund are receipts from licence and permit fees and amounts received from the Treasury for distribution in the form of subsidies to transport operators and others in certain areas. The expenditure from the fund includes amounts necessary to meet administration costs, such amounts as are necessary or expedient to be granted in aid of any transport service or scheme for which the Commissioner has a responsibility, and such amount as is necessary or expedient to establish and maintain a reserve of moneys to facilitate the carrying out by the Commissioner of his powers and functions under this Act.

**Taxi-cars (Co-ordination and Control) Act**

The *Taxi-cars (Co-ordination and Control) Act 1963-1980* constitutes a Taxi Control Board of seven members to provide for the co-ordination and control of taxi-cars and the registration and conduct of taxi-car drivers in the Metropolitan Traffic Area and such other areas as may be declared. The Act provides that the Board shall consist of the Commissioner of Transport (as Chairman); a representative appointed, from time to time, by the Road Traffic Authority; and five persons, appointed by the Governor, comprising one to represent the interests of local authorities, chosen from a panel of names that is obtained by each local authority submitting the name of one person; three industry members, including at least one taxi-car owner and one full-time driver, elected by taxi-car owners or full-time operators of taxi-cars; and one nominated by the Metropolitan (Perth) Passenger Transport Trust.

The principal functions of the Board are the formulations of schemes for the co-ordination and control of taxis; the determination of the number and kind of taxis to be licensed; the issue of licences; the determination of fares and other charges; the supervision of the operation of taxis and the regulation of stands; the registration of, and the control of the conduct and dress of, drivers; and the enforcement of regulations made under the Act.

It is provided that the number of taxis that may be licensed to operate within the metropolitan area shall not at any time exceed one for every 800 of the population of the area.

The Act established a Taxi Control Fund for the receipt of fees payable on the issue, renewal or transfer of licences. The expenses of the administration of the Act are paid from the Fund.

## Chapter IX—continued

### Part 4 — Communication

#### POSTS, TELEGRAPHS AND TELEPHONES

The first postmasters in the Colony of Western Australia were appointed at Perth and Fremantle in 1830 and a Postal Department was established by the Colonial Government in 1834. Telegraphic communication, between Perth and Fremantle, was inaugurated in 1869 by means of a private line, which was purchased by the Government in 1871. A telephone exchange system, installed and operated by the Government, was opened at Perth in 1887.

In 1901, following the federation of the Australian Colonies, the post, telegraph and telephone services of the State Governments were transferred to the Commonwealth Government. The Post and Telegraph Act of 1901 placed the services under the control of a Commonwealth Minister to be known as the Postmaster-General. The *Postal Services Act* 1975, *Telecommunications Act* 1975, and *Postal and Telecommunications Commissions (Transitional Provisions) Act* 1975 established two statutory authorities, the Australian Postal Commission (Australia Post) and the Australian Telecommunications Commission (Telecom) to control, respectively, from 1 July 1975, the postal and telecommunications services previously provided by the Postmaster-General's Department. Figures shown in the tables in the next two sections for the years ended 30 June 1976 to 1980, have been extracted from the annual reports of the new Commissions. Any figures shown for earlier years refer to the operations of and services previously provided by the Postmaster-General's Department.

#### Australian Postal Commission

The following table shows the number of persons employed by the Australian Postal Commission in Western Australia, and the number of post offices throughout the State at 30 June 1976 to 1980. Full-time employees are those directly under the control of the Commission. The remainder, shown as 'Other employees', provide services, which may or may not occupy their full time, under contract or in return for payments appropriate to work performed. 'Non-official' post offices are conducted by persons who are not officers of the Australian Postal Commission, and are frequently operated in conjunction with some other business activity.

AUSTRALIAN POSTAL COMMISSION  
NUMBERS OF EMPLOYEES AND OFFICES — WESTERN AUSTRALIA

Particulars	At 30 June —				
	1976	1977	1978	1979	1980
Full-time employees —					
Permanent officers	2,053	2,010	2,037	1,989	2,210
Temporary officers	309	340	321	358	188
Total	2,362	2,350	2,358	2,347	2,398
Other employees —					
Non-official postmasters and staff	396	380	383	367	341
Mail contractors (a)	308	319	313	303	321
Part-time employees	302	278	290	289	278
Total	1,006	977	986	959	940
Total, Employees	3,368	3,327	3,344	3,306	3,338
Post offices —					
Official	162	164	163	160	161
Non-official	381	376	376	365	335
Total	543	540	539	525	496

(a) Includes persons employed by contractors to drive vehicles on mail runs.

The net result of the operations throughout Australia of the Commission for the years ended 30 June 1976 to 1980 are shown in the following table. The amounts appearing under the heading of *Interest* represent interest on funds provided by the Treasury.

**AUSTRALIAN POSTAL COMMISSION**  
**STATEMENT OF REVENUE AND EXPENDITURE — AUSTRALIA**  
**(\$'000)**

Particulars	1975-76	1976-77	1977-78	1978-79	1979-80
<b>Revenue —</b>					
Mail services	402,221	435,790	456,739	528,978	582,200
Money order and postal order services	7,481	6,881	6,242	5,434	6,350
Commission on agency services	85,892	101,739	95,636	93,171	82,189
Other revenue	10,044	17,186	20,110	18,907	19,442
<b>Total, Revenue</b>	<b>505,638</b>	<b>561,596</b>	<b>578,727</b>	<b>646,490</b>	<b>690,181</b>
<b>Expenditure —</b>					
Operating and general (a)	354,995	395,675	426,100	476,915	530,875
Transportation (b)	46,723	50,168	55,343	44,842	52,744
Depreciation	7,959	9,341	11,786	13,926	11,934
Superannuation	43,994	54,253	60,250	65,550	59,500
Long service leave	13,514	16,383	17,083	18,582	20,588
Interest	6,791	6,877	6,098	4,086	2,854
<b>Total, Expenditure</b>	<b>473,976</b>	<b>532,697</b>	<b>576,660</b>	<b>623,901</b>	<b>678,495</b>
<b>Operating surplus available for appropriation</b>	<b>31,662</b>	<b>28,899</b>	<b>2,067</b>	<b>22,589</b>	<b>11,686</b>

(a) From 1978-79 this item includes the cost of operating the Commission's own motor transport fleet. In previous years this cost was shown as Transportation expenditure. (b) From 1978-79 this item includes only the cost of conveyance of mail by outside agencies. See also footnote (a).

Details of postal articles handled in Western Australia during the years 1974-75 to 1979-80 are shown in the following table.

**POSTAL ARTICLES HANDLED (a) — WESTERN AUSTRALIA**  
**(Thousands)**

Year	Ordinary postal articles		Parcels (b)	Registered articles (c)
	Standard letters	Non-standard articles		
POSTED FOR DELIVERY WITHIN AUSTRALIA				
1974-75	145,862	19,318	1,055	480
1975-76	125,588	16,648	782	310
1976-77	129,828	16,355	1,076	248
1977-78	142,559	15,259	1,433	278
1978-79	153,644	17,854	1,409	260
1979-80	157,217	18,861	1,529	265
POSTED FOR DELIVERY OVERSEAS				
1974-75	7,959	957	75	110
1975-76	7,016	808	63	87
1976-77	7,229	822	66	82
1977-78	5,950	1,003	72	84
1978-79	5,473	703	80	80
1979-80	7,198	908	92	82
RECEIVED FROM OVERSEAS				
1974-75	6,166	4,184	176	97
1975-76	5,852	3,060	165	100
1976-77	6,397	2,312	160	99
1977-78	7,517	2,374	144	111
1978-79	7,147	2,500	152	96
1979-80	7,252	2,458	144	99

(a) Excludes matter received from other Australian States. (b) Includes registered, cash on delivery and duty parcels. (c) Excludes registered parcels; see footnote (b).

### Australian Telecommunications Commission

The following table shows the number of persons employed by the Australian Telecommunications Commission in Western Australia at 30 June 1976 to 1980.

#### AUSTRALIAN TELECOMMUNICATIONS COMMISSION NUMBER OF EMPLOYEES — WESTERN AUSTRALIA

Particulars	At 30 June —				
	1976	1977	1978	1979	1980 (a)
Full-time employees —					
Permanent officers	5,922	5,779	5,618	6,579	6,493
Temporary officers	1,544	1,567	1,666	475	483
Total	7,466	7,346	7,284	7,054	6,976
Other employees —					
Part-time employees	177	162	166	161	160
Employees paid by other government authorities	27	50	53	44	48
Contract employees	97	94	81	81	79
Total	301	306	300	286	287
Total, Employees	7,767	7,652	7,584	7,340	7,263

(a) At 18 June.

The annual net results of the operations of the Commission throughout Australia for 1975-76 to 1979-80 are shown in the following table. The amounts appearing under the heading of *Interest* represent interest on funds provided by the Treasury.

#### AUSTRALIAN TELECOMMUNICATIONS COMMISSION PROFIT AND LOSS STATEMENT — AUSTRALIA (\$'000)

Particulars	1975-76	1976-77	1977-78	1978-79	1979-80
Earnings —					
Telephone rents	416,831	454,111	495,420	533,295	602,655
Telephone calls	839,580	967,331	1,078,830	1,211,057	1,355,373
Telephone connection fees and rearrangement charges	58,447	77,465	80,719	88,206	102,091
Telegrams	29,423	31,511	31,303	35,187	32,497
Telex rents	14,090	16,219	18,655	21,495	25,644
Telex calls	17,417	20,021	26,081	24,890	28,936
Other earnings	48,401	108,334	125,490	130,274	133,613
Total earnings	1,424,189	1,674,991	1,856,499	2,044,404	2,280,809
Expenses —					
Maintenance of plant (a)	278,125	355,196	386,723	424,736	576,760
Operating (a)	236,148	275,278	288,573	307,994	399,873
General and administrative (a)	62,621	71,520	105,160	137,001	178,739
Accommodation (a)	50,224	64,678	74,705	85,917	99,382
Depreciation	312,358	340,817	366,514	410,412	447,383
Superannuation	70,395	100,381	106,669	118,887	(b)
Long service leave	22,336	24,090	25,949	30,849	(b)
Interest	239,588	278,629	317,288	338,090	367,127
Total expenses	1,271,795	1,510,589	1,671,580	1,853,885	2,069,264
Profit	152,393	164,403	184,918	190,519	211,545

(a) From 1979-80, these expenses also include shares of *Superannuation* and *Long service leave* previously shown separately. (b) See footnote (a).

The total number of employees of the Telecommunications Commission throughout Australia at 18 June 1980 was 91,069.

Figures relating to the cash receipts and expenditure of the Commission in Western Australia during the years 1977-78 to 1979-80 are given in the following table. Some additional items of revenue and expenditure are not apportioned to States and therefore do not appear in the table. The figures shown relate to actual collections and payments made and as such they do not represent the net results of the Commission's operations in Western Australia for the year.

**AUSTRALIAN TELECOMMUNICATIONS COMMISSION**  
**CASH RECEIPTS AND EXPENDITURE — WESTERN AUSTRALIA (\$'000)**

Cash receipts				Cash expenditure			
Particulars	1977-78	1978-79	1979-80	Particulars	1977-78	1978-79	1979-80
Telephone	146,391	163,155	185,123	Salaries and wages	79,349	82,907	91,926
Telegraph	7,097	6,915	7,742	Material	33,626	36,076	35,322
Proceeds of sales	1,546	1,527	1,190	Buildings, sites, properties	11,108	4,114	5,185
Recoverable works	2,334	1,753	1,781	Accommodation services	4,812	5,309	5,297
Miscellaneous	—25	—33	—3	Other administrative expenses	17,468	18,259	18,216
<b>Total</b>	<b>157,343</b>	<b>173,317</b>	<b>195,832</b>	<b>Total</b>	<b>146,362</b>	<b>146,665</b>	<b>155,946</b>

**Telegraphs and Telephones.** Telegrams can be lodged at any post office, telephone office or from any public telephone equipped for multi-coin operation. In addition, telegrams can be dispatched from any subscriber's telephone or teleprinter exchange (telex) equipment. The number of telegraph offices in the State and of telegrams transmitted from Western Australia during the years 1974-75 to 1979-80 are set out below.

Telephone services comprise ordinary exchange services (i.e. those which provide direct access to the exchange system by means of exclusive use of an exchange line), duplex services, party-line services, private branch exchange services and public telephones. The numbers shown as 'Telephone instruments in service' relate to those through which direct access to the exchange system may be obtained.

At 30 June 1980, the pair length of conductors in telegraph and telephone cables in Western Australia was 3,036,622 kilometres. The pair length of aerial wires was 63,834 kilometres and the length of pole routes was 20,345. There were 10,167 tube kilometres of coaxial cable.

The teleprinter exchange service (telex) was introduced in Perth in December 1956. This service enables a subscriber's teleprinter to be connected with that of any other subscriber in the local network or networks in other States.

**TELEGRAPHS — WESTERN AUSTRALIA**

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Number of —						
Offices (a)	623	609	595	584	561	535
Telegrams dispatched —	'000	'000	'000	'000	'000	'000
Within Australia	1,926	1,502	1,241	1,021	721	533
Beyond Australia	193	176	182	190	186	178

(a) At 30 June. For 1979-80, at 18 June.

**TELEPHONES AND EXCHANGES (a) — WESTERN AUSTRALIA**

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Number of —						
Exchanges	733	729	723	709	690	687
Services —						
Metropolitan (b)	177,607	189,369	203,503	254,382	276,035	297,191
Outer Metropolitan (c)	20,520	24,281	28,471			
Country	64,343	66,574	71,435	77,466	84,279	92,145
<b>Total</b>	<b>262,470</b>	<b>280,224</b>	<b>303,409</b>	<b>331,848</b>	<b>360,314</b>	<b>389,336</b>
Telephone instruments in service —						
Total	376,589	404,041	436,033	472,788	514,460	556,831
Per 100 of population	33.5	35.2	36.8	38.8	41.6	44.6

(a) At 30 June. For 1979-80, at 18 June. (b) Services connected to exchanges located within 16 kilometres of the General Post Office, Perth. (c) Services connected to exchanges located between 16 kilometres and 32 kilometres of the General Post Office, Perth.

**TELEPRINTER EXCHANGE NETWORK (TELEX) — WESTERN AUSTRALIA**

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Number of —						
Services at 30 June (a)		1,573	1,803	2,034	2,733	3,205
Internal calls (b)	'000	3,027	3,159	3,208	4,021	4,565

(a) For 1979-80, at 18 June. (b) Includes Post Office official traffic.



## RADIOCOMMUNICATION

The Overseas Telecommunications Commission (Australia) is the authority responsible for the operation of telecommunication services between Australia and other countries, with ships at sea and to and between Australia's external Territories.

The Commission was established under the provisions of the *Overseas Telecommunications Act* 1946 which implemented a recommendation of the 1945 Commonwealth Telecommunications Conference for national ownership of the external telecommunications services of the British Commonwealth countries concerned. In 1966 the Commonwealth countries completed a review of the machinery for their collaboration in telecommunications and, as a result, the Commonwealth Telecommunications Organisation was established. The purpose of this body is to promote the efficient exploitation and development of the Commonwealth external telecommunications system.

A number of countries, including Australia, agreed in 1964 to establish a global commercial communications satellite system and Australia, represented by the Commission, is a member of the management body of the 102 nation International Telecommunications Satellite Consortium (INTELSAT).

The Commission operates three 'standard' earth stations (at Carnarvon in Western Australia, Ceduna in South Australia and Moree in New South Wales) which can communicate via satellite with stations in other countries. The standard station at Carnarvon was brought into service on 1 October 1969, enabling a non-standard earth station at Carnarvon to be released for the full-time performance of telemetry, tracking and command functions for the INTELSAT organisation.

The transmission facilities used by the Commission in its external operations are submarine cables, satellites and high frequency radio. It operates a coastal radio service and, in association with the Telecommunications Commission within Australia and with communication carriers in other Commonwealth and foreign countries, provides public message telegram, telephone, telex, photo-telegram, leased circuit and television services to most countries and places throughout the world.

The coastal radio service provides, as its principal function, essential maritime communications, including distress signals, navigation warnings, air-sea rescue service and radio-medical service messages, meteorological messages and time signals, as well as naval traffic as required. It provides also, by radiotelegraph and radiotelephone, commercial communications with ships at sea and, by radiotelephone, message communication with small vessels. Western Australian coastal radio stations are located at Perth, Broome, Carnarvon, Esperance and Geraldton.

The licensing of civil radiocommunication stations and the transmission of radio messages within Australia are the responsibility of the Australian Telecommunications Commission. The Royal Flying Doctor Service of Australia, to which reference is made in Part 3 of Chapter V, provides general telegraph facilities in remote areas through its extensive radio network.

At 30 June 1980 there were 417,879 civil radiocommunication stations authorised throughout Australia. They comprised 6,795 fixed stations, 26,267 land stations, 370,933 mobile stations, 13,873 amateur stations and 11 space services.

The numbers of each type of radiocommunication station authorised to operate in Western Australia at 30 June 1980 are given in the next table. The following definitions are relevant in considering the figures shown in the table. *Fixed Stations* — Stations established at fixed locations for communication with other stations similarly established. *Outposts* — Stations established in outback areas for communication with control stations such as those of the Royal Flying Doctor Service. *Land Stations* — Stations established at fixed locations for communication with mobile stations. *Coast Stations* — Land stations for communication with ocean-going vessels. *Mobile Stations* — Equipment installed in aircraft (aeronautical), motor

vehicles (land mobile services), harbour vessels (harbour mobile services) and ocean-going vessels (ships), and mobile equipment of organisations such as the Royal Flying Doctor Service. *Radiodetermination Stations* — Stations employed for the determination of position, or the obtaining of information relating to position, by means of the propagation of radio waves. *Space Services* — Radiocommunication services, between earth stations and space stations, between space stations or between earth stations when signals are re-transmitted by space stations, or transmitted by reflection from objects in space, excluding reflection or scattering by the ionosphere or within the earth's atmosphere.

#### CIVIL RADIOCOMMUNICATION STATIONS AUTHORISED AT 30 JUNE 1980

Type of station	Number	Type of station	Number
Transmitting and receiving —		Transmitting and receiving — <i>cont.</i>	
Fixed stations —		Mobile stations —	
Aeronautical	19	Aeronautical	744
Services with other countries	15	Land mobile services	38,707
Outpost	378	Harbour mobile services	1,712
Other	349	Outpost	888
Land stations —		Radiodetermination	84
Aeronautical	74	Ship	2,078
Base stations —		Earth and space services	2
Land mobile services	3,104	Amateur	980
Harbour mobile services	130		
Coast	95	Total	49,521
Experimental	118	Receiving only (fixed)	129
Repeater	44		
		GRAND TOTAL	49,650

#### BROADCASTING AND TELEVISION

Prior to the passage of the *Broadcasting and Television Amendment Act (No. 2) 1976* broadcasting and television services throughout Australia were controlled by the Australian Broadcasting Control Board under the direction of the Minister for Post and Telecommunications. The 1976 legislation constituted the Australian Broadcasting Tribunal which replaced the Australian Broadcasting Control Board as from 1 January 1977. The *Broadcasting and Television Amendment Act (No. 2) 1976* placed under the Tribunal's general control the National Broadcasting Service, the National Television Service, the Commercial Broadcasting Service, the Commercial Television Service, the Public Broadcasting Service and the Public Television Service. Other relevant Acts are the *Broadcasting Stations Licence Fees Act 1964*, the *Television Stations Licence Fees Act 1964* and the *Parliamentary Proceedings Broadcasting Act 1946*. Under the last-mentioned Act the Australian Broadcasting Commission is obliged to broadcast the proceedings of the Senate or the House of Representatives as determined by a Parliamentary Joint Committee.

The principal functions of the Australian Broadcasting Tribunal, which consists of a minimum of three and a maximum of six full-time members, are to determine the standards to be observed by licensees in respect of the broadcasting or televising of programmes, the conditions subject to which advertisements may be broadcast or televised and the hours during which programmes may be transmitted. The Tribunal is required to hold public inquiries into applications for licences for commercial broadcasting and television stations in areas for which the Minister proposes to grant licences. It is also the responsibility of the Tribunal to determine, subject to any direction of the Minister, the situation, operating power and operating frequencies of broadcasting and television stations.

The Australian Broadcasting Commission, which was constituted under the *Broadcasting and Television Act 1942*, controls the activities of, and provides programmes for, the National Broadcasting Service and the National Television Service which use transmitters operated by the Australian Telecommunications Commission. The operations of the Australian Broadcasting Commission are financed by appropriations made by the Commonwealth Parliament.

The income of licensees of commercial broadcasting and television stations is derived from advertisements and other forms of publicity.

Public broadcasting and television services operate on a non-profit basis and may be licensed to provide services for people within a specified area or to provide programmes having a specified nature or purpose.

In 1923, the first radio broadcasting station commenced operations in Australia and, in the following year, station 6WF (Westralian Farmers) opened in Perth. The following table shows details of stations operating in Western Australia at 30 June 1980. At that date there were twenty-one national, sixteen commercial and three public broadcasting stations in the State.

NATIONAL STATIONS				COMMERCIAL STATIONS			
Type and location	Call sign	Frequency (kHz)	Hours of service per week ( <i>a</i> )	Type and location	Call sign	Frequency (kHz)	Hours of service per week ( <i>a</i> )
<b>Medium frequency —</b>				<b>Medium frequency —</b>			
Perth	6WF	720	133	Perth	6IX	1,080	168
Perth	6WN	810	133	Perth	6KY	1,206	168
Albany	6AL	630	133	Perth	6PM	990	168
Broome	6BE	675	133	Perth	6PR	882	168
Busselton	6BS	684	133	Albany	6VA	783	133
Carnarvon	6CA	846	133	Bridgetown	6BY	900	133
Dalwallinu	6DL	531	133	Bunbury	6TZ	963	131
Derby	6DB	873	133	Collie	6CI	1,134	131
Esperance	6ED	837	133	Dampier/Karratha/Roebourne	6KA	1,260	118
Exmouth	6XM	1,188	133	Geraldton	6GE	1,008	117
Geraldton	6GN	828	133	Kalgoorlie	6KG	981	126
Kalgoorlie	6GF	648	133	Katanning	6WB	1,071	133
Kununurra	6KW	756	133	Merredin	6MD	1,098	121
Newman	6MN	567	133	Narrogin	6NA	918	131
Northam	6NM	612	133	Northam	6AM	864	168
Paraburdoo	6PU	567	133	Port Hedland	6NW	1,026	118
Port Hedland	6PH	603	133				
Tom Price	6TP	567	133				
Wagin	6WA	558	133				
Wyndham	6WH	1,017	133				
<b>High frequency —</b>				<b>PUBLIC STATIONS (<i>c</i>)</b>			
Perth	VLW	( <i>b</i> )	133	<b>Medium frequency —</b>			
				Perth ( <i>d</i> )	6NR	927	91
				<b>Frequency modulation —</b>			
				Perth ( <i>e</i> )	6UVS	( <i>e</i> )	101
				Newman	6NEW	( <i>f</i> )	168

(a) To the nearest hour. (b) The station operates two transmitters, of 10,000 and 50,000 watts. Frequencies are varied as required to obtain optimum results. (c) Stations licensed under the *Wireless Telegraphy Act* 1903. (d) Operated by the Western Australian Institute of Technology. (e) Operated by the University of Western Australia on a frequency of 92.1 MHz. (f) Operated on a frequency of 92.9 MHz.

The first television station in Western Australia commenced full-scale transmission in Perth on 16 October 1959 and, at 30 June 1980 three metropolitan and nineteen country television stations were operating in the State. Details are shown in the following table, in which particulars are given of both national and commercial stations.

## TELEVISION STATIONS AT 30 JUNE 1980

Call sign and channel	Area served	Location of transmitter	Hours of service per week (a)	Date of commencement of operations (b)
NATIONAL STATIONS				
ABW-2	Perth	Bickley	84	7 May 1960
ABAW-2	Southern Agricultural	Mount Barker	84	6 June 1966
ABCW-5A	Central Agricultural	Mawson Trig	84	28 March 1966
ABCMW-8	Morawa	Billaranga Hills	84	8 March 1975
ABCNW-7	Carnarvon	Carnarvon	84	30 June 1972
ABDW-10	Dampier	Dampier	84	17 December 1973
ABEW-10	Esperance	Microwave Terminal Wireless Hill	84	21 October 1974
ABG W-6	Geraldton	Geraldton	84	8 December 1969
ABKAW-7	Karratha	Karratha	84	17 December 1973
ABKW-6	Kalgoorlie	Kalgoorlie	84	27 January 1970
ABMW-10	Moora	Quarrell Range	84	30 September 1974
ABNW-7	Norseman	Norseman Microwave Repeater	84	14 April 1971
ABPHW-7	Port Hedland	Port Hedland	84	3 October 1973
ABRBW-9	Roebourne	Roebourne	84	17 December 1973
ABSW-5	Bunbury	Mount Lennard	84	10 May 1965
ABSBW-9	Southern Cross-Bullfinch	Ghooli Microwave Repeater	84	16 July 1973
COMMERCIAL STATIONS				
STW-9	Perth	Bickley	116	12 June 1965
TVW-7	Perth	Bickley	118	16 October 1959
BTW-3	Bunbury	Mount Lennard	62	10 March 1967
GSW-9	Southern Agricultural	Mount Barker	62	23 August 1968
GTW-11	Geraldton	Geraldton	40	21 January 1977
VEW-8	Kalgoorlie	Kalgoorlie	38	18 June 1971

(a) To the nearest hour. (b) Date on which full-scale transmission began.

Television transmissions by means of either a repeater station or a translator station are provided to some areas of the State not served by the stations shown in the previous table. Repeater stations are stations of low operating power designed to transmit only programmes recorded on magnetic tape. At 30 June 1980 television repeater stations were operating at Cockatoo Island, Koolan Island, Leinster, Mount Nameless, Mount Tom Price, Newman and Paraburdoo. Translator stations are low-powered stations which receive signals from a parent station or another translator station and re-transmit those signals on a different frequency channel. They serve mainly isolated areas where there is not satisfactory reception from high-powered stations.

## TELEVISION TRANSLATOR STATIONS AT 30 JUNE 1980

		Parent station	
Area served	Location of transmitter	Call sign and channel	Area served
NATIONAL STATIONS			
Albany	Mount Clarence	ABAW-2	Southern Agricultural
Kambalda	Red Hill	ABKW-6	Kalgoorlie
Katanning	Fairfield Microwave Repeater Station	ABW-2	Perth
Koolyanobbing	Wundowie Hills	ABSBW-9	Southern Cross-Bullfinch
Merredin	Radio Telephone Site	ABW-2	Perth
Mullewa	Mullewa	ABG W-6	Geraldton
Narrogin	Narrogin Microwave Repeater Site	ABW-2	Perth
Newman	TV Hill	ABW-2	Perth
Pannawonica	Pannawonica	ABW-2	Perth
Wagin	Mount Latham Microwave Repeater Station	ABW-2	Perth
Wongan Hills	Wongan Hills	ABMW-10	Moora
COMMERCIAL STATIONS			
Albany	Mount Clarence	GSW-9	Southern Agricultural
Kambalda	Red Hill	VEW-8	Kalgoorlie
Katanning	Fairfield Microwave Repeater Site	BTW-3	Bunbury
Mawson	Mawson National Transmitter Site	BTW-3	Bunbury
Merredin	ATC R/T Site	VEW-8	Kalgoorlie
Narrogin	Narrogin Microwave Repeater Site	BTW-3	Bunbury
Northam	Northam	BTW-10	Bunbury
Wagin	Mount Latham Microwave Repeater Site	BTW-3	Bunbury

## CHAPTER X — INDUSTRIAL CONDITIONS, EMPLOYMENT AND PRICES

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# CHAPTER X — INDUSTRIAL CONDITIONS, EMPLOYMENT AND PRICES

## Part 1 — Industrial Conditions

### INDUSTRIAL AUTHORITIES

#### Federal Authorities

**Federal Court of Australia.** The Federal Court of Australia, as constituted by the *Federal Court of Australia Act 1976* consists of a Chief Judge and such other Judges as are appointed under the Act, and comprises an Industrial Division and a General Division. The Industrial Division deals with all proceedings under the Conciliation and Arbitration Act and related legislation. The Federal Court of Australia Act provides that, except in respect of certain specified situations, the jurisdiction of the Industrial Division shall be exercised by a Full Court comprising not less than three Judges. A single Judge may refer a question of law for the opinion of a Full Court. The Australian Conciliation and Arbitration Commission may also refer a question of law for the opinion of the Court. Appeal from a judgment of a Full Court may, in certain circumstances, be made to the High Court of Australia.

**Australian Conciliation and Arbitration Commission.** The Australian Conciliation and Arbitration Commission, according to the provisions of the *Conciliation and Arbitration Act 1904*, comprises a President and such numbers of Deputy Presidents and of Commissioners 'as are necessary from time to time'. The President and the Deputy Presidents are described as 'Presidential Members' of the Commission. The powers of the Commission include the prevention or settlement, by conciliation or arbitration, of industrial disputes which extend beyond the limits of any one State, but the Commission is authorised to conciliate or arbitrate in respect of any dispute or industrial matter associated with Commonwealth Government undertakings or projects. A Full Bench of the Commission consists of not less than three members, including at least two Presidential Members. The power to make awards or certify agreements making provision for, or altering, standard hours, rates of wages (including a minimum wage), annual leave or long service leave is exercisable only by a Full Bench, except where the provision or alteration gives effect to matters, or is in accordance with principles, determined by a Full Bench. The Principal Registry of the Commission is in Melbourne, Victoria, and there is a Deputy Industrial Registrar in each State.

#### Western Australian Authorities

A Court of Arbitration was established in Western Australia in 1901 under the provisions of the *Industrial Conciliation and Arbitration Act 1900*. The Court of Arbitration was replaced, with effect from 1 February 1964, by the Western Australian Industrial Appeal Court and The Western Australian Industrial Commission, authorities constituted in terms of the *Industrial Arbitration Act 1912-1977*. These authorities continue to operate under the provisions of the *Industrial Arbitration Act 1979-1980* which was proclaimed on 1 March 1980.

**Western Australian Industrial Appeal Court.** The Western Australian Industrial Appeal Court consists of three Judges, one of whom is the Presiding Judge. The members are nominated by the Chief Justice of Western Australia. An appeal lies to the Court from decisions of the President of the Western Australian Industrial Commission, the Full Bench or the Commission in Court Session but only on the ground that the decision is erroneous in law or is in excess of jurisdiction.

**The Western Australian Industrial Commission.** The Western Australian Industrial Commission consists of a President, a Chief Industrial Commissioner, a Senior Commissioner, and 'such number of other Commissioners as may, from time to time, be necessary'. There were five 'other Commissioners' at 1 March 1981. A person shall not be appointed as President unless he is qualified to be a Judge, and on appointment he is entitled to the status of a Puisne Judge. The President or a Commissioner sitting or acting alone constitutes the Commission and may exercise the appropriate powers of the Commission.

The Commission can inquire into any industrial matter and make an award, order or declaration relating to such matter. 'Industrial matter' means any matter affecting or relating to work, privileges, rights, or duties of employers or employees in any industry and includes any matter relating to the wages, salaries, allowances, or other remuneration of employees or the prices to be paid in respect of their employment; the hours of employment, sex, age, qualification or status of employees and the mode, terms and conditions of employment including conditions which are to take effect after the termination of employment. The Commission may also make inquiries where industrial action has occurred or is likely to occur.

The Commission in Court Session is constituted by not less than three Commissioners sitting or acting together, and may make General Orders, hear matters referred by the Commission, and hear appeals from decisions of Boards of Reference.

The Full Bench is constituted by not less than three members of the Commission, one of whom is the President, and may hear matters referred by the Commission on questions of law, and appeals from decisions of the Commission.

The following table shows details of the number of industrial awards, unions and members registered with The Western Australian Industrial Commission.

#### INDUSTRIAL AWARDS, UNIONS AND MEMBERS REGISTERED

Particulars	At 30 June —					
	1975	1976	1977	1978	1979	1980
Awards in force	393	402	414	393	355	(a) 494
Consent agreements in force (a)	150	184	180	205	135	—
Unions of workers —						
Number	85	85	80	77	77	74
Membership	178,171	180,137	185,186	184,578	192,056	181,409
Unions of employers —						
Number	14	15	15	15	14	14
Membership	2,181	2,026	2,021	2,156	2,102	2,040

(a) Named as *Industrial Agreements* prior to 1980.

**Western Australian Coal Industry Tribunal.** The Western Australian Coal Industry Tribunal, as constituted under the *Mining Act 1904-1973*, consists of five members appointed by the Governor. One member is chairman of the Tribunal, and there are two members representing employees, and two representing employers. The Tribunal has power to consider and determine industrial disputes, not extending beyond the limits of the State, and other matters relating to the coal-mining industry.

#### EMPLOYER ORGANISATIONS

The first employers' organisation in Western Australia was the West Australian Chamber of Commerce which was founded in 1853 and was replaced by the Fremantle Chamber of Commerce in 1873. The Perth Chamber of Commerce (Incorporated) was founded in 1890. Other Chambers of Commerce operate in various parts of the State.

The two major organisations representative of employers in industrial relations matters are the Confederation of Western Australian Industry (Incorporated) and the Australian Mines and Metals Association (Incorporated).

The Confederation of Western Australian Industry (Incorporated) has 8,300 individual members and 92 affiliated trade, industry and professional associations. It is the merged body of the former Western Australian Employers' Federation and the West Australian Chamber of Manufactures. The former was founded in 1913 to handle labour relations for private industry throughout the State and the latter began in 1890 but disbanded and was formed again in 1899. The Confederation is controlled by a Board elected by its members and representative of its Labour Relations Council, Manufacturing Industry Council and Committee of Affiliated Associations.

The Australian Mines and Metals Association (Incorporated) is an association of mining companies which was established in Victoria in 1918 and opened a branch office in Western Australia in 1968. Its activities are mainly directed to the industrial relations interests of its members in the mining and allied industries (including hydrocarbons).

Both the Confederation of Western Australian Industry (Incorporated) and the Australian Mines and Metals Association represent employers in all aspects of the negotiation of industrial awards and agreements, in the settlement of industrial disputes, including arbitration, and in direct relationships with the trade unions. Both are members of the Confederation of Australian Industry (C.A.I.) which came into existence on 1 December 1977 and replaced the Associated Chambers of Manufactures and the Australian Council of Employers' Federation. Through C.A.I. they have overseas affiliation with the International Organisation of Employers.

### EMPLOYEE ORGANISATIONS

The trade unions in Western Australia cover all forms of occupations from the unskilled to the professional worker. The great majority of union organisations are national in character with State branches registered with both the Federal and State industrial authorities.

Major organisations are the Trades and Labor Council of Western Australia, the State branches of the Australian Council of Salaried and Professional Associations, the Australian Public Service Federation, and the Council of Australian Government Employee Organisations. These four groups cover most of the wage and salary earners employed in the private and governmental sectors of industry and commerce.

The Trades and Labor Council of Western Australia, which is the State branch of the Australian Council of Trade Unions (A.C.T.U.), has provincial councils at Albany, Geraldton, Kalgoorlie and Port Hedland. At 30 June 1980 it had affiliated with it seventy-five State resident unions having a membership of approximately 115,000.

The Trades and Labor Council, representing the largest group of wage and salary earners, frequently acts on behalf of employees in matters before the Western Australian industrial authorities such as wages, hours, holidays, long service leave, and other associated matters of a standard or uniform nature.

The next table gives particulars of the number of trade unions in Western Australia and the number of members at the end of December for the years 1975 to 1979. The table also shows the estimated percentage of trade union members to total wage and salary earners in employment. The percentages should be regarded as giving only a broad indication of the extent of union membership among wage and salary earners because they are based on estimates of *employed* wage and salary earners that are subject to revision. The degree of unemployment among reported union members would affect the percentages for a particular year and comparisons between years.



TRADE UNIONS — NUMBERS AND MEMBERSHIP <sup>r</sup>

Date	Number of unions	Number of members ('000)			Proportion of total wage and salary earners (a) (per cent)		
		Males	Females	Persons	Males	Females	Persons
End of December —							
1974	153	152.6	70.8	223.4	57	48	54
1975	149	157.3	67.7	225.1	61	47	56
1976	148	160.3	72.7	233.0	62	48	57
1977	153	162.7	77.1	239.7	61	50	57
1978	153	160.1	75.7	235.8	61	48	56
1979	154	160.7	80.6	241.3	61	50	57

(a) Approximate; see text preceding table.

## APPRENTICESHIP AND INDUSTRIAL TRAINING

The first registration of an apprentice in Western Australia was made on 25 May 1903 to the trade of book binding. At 30 June 1980 the total number of apprentices registered in this State was 13,138 in a wide variety of trades.

Prior to 6 February 1978, all industrial aspects of apprenticeship were under the jurisdiction of The Western Australian Industrial Commission, as provided for by the *Industrial Arbitration Act 1912-1977*.

The *Industrial Training Act 1975* came into operation on 6 February 1978 and provided for the establishment of the Industrial Training Advisory Council, comprising seven members representing the Department of Labour and Industry, The Confederation of Western Australian Industry (Incorporated), the Trades and Labor Council of Western Australia, the Technical Education Division of the Education Department and a State instrumentality. The functions of the Council are to liaise with employer and employee organisations and bodies in the State which provide courses of industrial training and to advise the Government on matters affecting industrial training. It also recommends trades to be prescribed by regulation as apprenticeship trades, industrial training trades, or as both and appoints Industrial Training Advisory Boards to deal with apprenticeship matters relevant to the trades they are appointed to review. At 30 June 1980 there were thirty-seven of these Boards in operation. An apprenticeship is an agreement which covers the period of time during which an apprentice is contracted to an employer to learn all phases of a trade. It is a form of on-the-job training, and combines practical experience at work with further training at technical school. An apprentice is any person bound to an employer or an industrial training advisory board to learn an apprenticeship trade prescribed under the Act. There is no minimum age prescribed although, in practice, the minimum age is the school leaving age which is at end of the year during which the student turns fifteen. At 30 June 1980, ninety trades had been prescribed as apprenticeship trades. An industrial trainee is any person who undertakes a course of training in an industrial training trade prescribed under the Act. At 30 June 1980 no trades had been prescribed as industrial training trades under the Act.

The Act also establishes a Division of Industrial Training in the Department of Labour and Industry to administer all aspects of industrial training and, through the Registrar of Industrial Training, to maintain a Register of Apprentices and a Register of Industrial Trainees. The Western Australian Industrial Commission retains responsibility for remuneration, working conditions and settlement of industrial disputes arising out of matters of apprenticeship and industrial training.

The Council is required to appoint an industrial training advisory board in respect of each trade or group of trades which is prescribed as an apprenticeship trade or an industrial training trade. The Act also allows for a trade or group of trades to be defined by regulation as a 'special trade' in which case an apprentice or industrial trainee is indentured to the industrial training advisory board appointed in relation to that trade and is placed with an employer by that

board. Within the building trade the bricklaying, stonemasonry, plastering and tilelaying apprenticeship trades have each been prescribed as a 'special trade'.

The following table shows the number of new registrations effected during the twelve months ended 30 June 1980, together with the total number of apprentices registered in this State at the end of that period.

**APPRENTICESHIP — NEW REGISTRATIONS AND  
NUMBER OF EFFECTIVE REGISTRATIONS TO VARIOUS TRADES (a)**

Trade	Registrations effected during year ended 30 June 1980	Effective registrations at 30 June 1980
<b>Metal trades —</b>		
Blacksmithing	15	54
Jobbing, moulding and coremaking	23	54
Boilermaking	112	296
Sheetmetal	98	319
Fitting	228	555
Fitting and turning	187	601
First class machining	26	55
First class welding (engineering)	69	184
Fitting and first class machining	101	198
Motor mechanics	468	1,943
Refrigeration fitting	72	211
Plant mechanics (agricultural and industrial)	60	60
Turning and iron machining	—	16
Steel construction	—	29
Boilermaking and first class welding	117	324
Steel construction and first class welding	14	56
Instrument fitting	37	121
Other	126	327
<b>Electrical trades —</b>		
Electrical fitting	284	826
Electrical installing	179	615
Automotive electrical fitting	37	134
Radio and television servicing	22	97
Other	1	2
<b>Building trades —</b>		
Bricklaying	64	191
Carpentry and joinery	257	818
Plumbing	136	535
Plastering	15	60
Painting and decorating	87	264
Glazing	22	53
Other	31	98
<b>Printing trades —</b>		
Composing	71	160
Printing machining	110	95
Other	80	71
<b>Vehicle building trades —</b>		
Bodymaking	50	145
Trimming	11	43
Painting (vehicle building)	53	231
Panel beating	62	292
Other	13	45
<b>Food trades —</b>		
General butchering	112	420
Baking	31	96
Pastry cooking	26	61
Cooking	124	336
Other	1	8
<b>Other trades —</b>		
Cabinetmaking	129	443
Woodmachining	29	87
Upholstering	18	49
Male hairdressing	40	118
Ladies hairdressing	271	904
Horticulture	95	142
Other	116	296
<b>GRAND TOTAL</b>	<b>4,330</b>	<b>13,138</b>

(a) Because of changes in the statistical collection procedures of the Division of Industrial Training, these figures are not comparable with figures published in the 1979 and earlier editions of the Western Australian Year Book.

Apprentices or industrial trainees are employed on probation for a period of three months. This period counts as service if the person subsequently becomes an apprentice or industrial trainee in that trade. Under certain circumstances, the employment of an apprentice or industrial trainee may be transferred from one employer to another. Every apprentice or industrial trainee is required to regularly attend all technical training classes prescribed in relation to that trade. Apprenticeships may be for a period of 3, 3½, 4 or 5 years. Where a minor satisfactorily completes an approved pre-apprenticeship course conducted by the Technical Education Division of the Education Department, the period of apprenticeship may be three years.

Federal awards are of less significance than State awards in apprenticeship matters in Western Australia. Section 52 of the Conciliation and Arbitration Act enables the Australian Conciliation and Arbitration Commission to issue awards covering the rates of pay and conditions of employment of apprentices. A number of such awards provide that Statutes or Regulations relating to apprenticeships in force in the State in which the apprentice is employed shall apply, except where they are inconsistent with the terms of the award.

#### INCIDENCE OF INDUSTRIAL AWARDS

The next table indicates the approximate proportions of Western Australian employees covered by awards, determinations and registered industrial agreements under Federal and State jurisdiction. The proportions not so covered (including those working under unregistered industrial agreements) are also shown. The figures summarise part of the data obtained from surveys of the Australian wage structure in May 1963, May 1968, May 1974 and May 1976.

PROPORTION OF EMPLOYEES AFFECTED BY AWARDS, ETC. (a)  
(Per cent)

Survey	Males				Females				Persons			
	Employees affect- ed by awards, etc.		Other employ- ees	Total	Employees affect- ed by awards, etc.		Other employ- ees	Total	Employees affect- ed by awards, etc.		Other employ- ees	Total
	Federal	State			Federal	State			Federal	State		
May 1963	13.3	76.5	10.2	100.0	14.8	74.4	10.8	100.0	13.6	76.0	10.4	100.0
May 1968	16.9	70.7	12.4	100.0	15.7	76.1	8.2	100.0	16.6	72.1	11.3	100.0
May 1974	18.8	64.1	17.1	100.0	14.5	76.0	9.6	100.0	17.4	68.0	14.7	100.0
May 1976	20.1	64.3	15.7	100.0	13.9	78.2	7.8	100.0	18.0	69.0	12.9	100.0

(a) Awards or determinations of, and collective agreements registered with, Federal or State industrial authorities.

The estimates shown in the table were derived from returns collected from:

- (i) a stratified random sample of most private employers subject to pay-roll tax;
- (ii) all public hospitals and marketing boards;
- (iii) all Commonwealth Government and State Government departments and semi-government authorities; and
- (iv) a stratified random sample of local government bodies.

For further information relating to these statistics the reader is referred to the publication *Incidence of Industrial Awards, Determinations and Collective Agreements, May 1974* (Catalogue No. 6315.0), published by the Australian Statistician, Canberra.

For a number of reasons, the results of the four surveys are not strictly comparable, and the statistics presented in the previous table should therefore be regarded as providing only a broad indication of trends.

The term 'awards, etc.' as used in the table means awards or determinations of, and agreements registered with, Federal or State industrial authorities. Changes in the proportions of employees reported as affected by Federal awards and by State awards reflect changes in industry and occupational structure, including the creation of new industries; changes in the coverage of individual Federal and State awards; and the creation of new awards relating to employees not previously affected by awards.

## INDUSTRIAL DISPUTES

Statistics of industrial disputes are compiled by the Australian Statistician from data obtained from the following sources: direct collections from employers and trade unions concerning individual disputes; reports from government departments and authorities; reports of State and Federal industrial authorities; and information contained in trade journals, employer and trade union publications, and newspaper reports.

## INDUSTRIAL DISPUTES (a)

Year	Number of disputes	Number of workers involved			Number of working days lost	Estimated loss in wages
		Directly	Indirectly (b)	Total		
		'000	'000	'000	'000	\$'000
1975	236	47.5	6.3	53.8	100.7	3,075.2
1976	250	92.4	8.3	100.7	252.1	8,461.9
1977	229	49.1	5.8	54.9	220.5	8,582.0
1978	306	70.5	5.7	76.1	197.9	7,736.0
1979	252	166.7	2.9	169.5	348.1	14,118.0
1980	368	62.2	7.2	69.4	191.0	9,615.0

(a) Excludes disputes involving cessation of work of less than 10 man-days.

(b) Persons thrown out of work at the establishments where the stoppages occurred, but not themselves parties to the dispute.

## INDUSTRIAL DISPUTES (a) — INDUSTRIES: 1980

Industry (b)	Disputes	Workers involved (c)	Working days lost	Estimated loss in wages
	No.	'000	'000	\$'000
Agriculture, forestry, fishing and hunting	—	—	—	—
Mining —				
Coal mining	—	—	—	—
Other mining	278	31.3	77.7	4,270
Manufacturing —				
Food, beverages and tobacco	8	3.1	7.2	320
Textiles; Clothing and footwear	—	—	—	—
Wood, wood products and furniture	—	—	—	—
Paper and paper products, printing and publishing	1	0.3	6.1	382
Chemical, petroleum and coal products	1	0.2	—	3
Metal products, machinery and equipment	7	7.3	15.4	651
Other manufacturing	2	0.6	1.0	42
Electricity, gas and water	2	2.4	25.3	1,213
Construction	11	3.6	15.1	902
Wholesale and retail trade	3	0.4	5.5	222
Transport and storage; Communication —				
Railway transport; Air transport	5	6.7	11.2	456
Water transport —				
Stevedoring services	23	5.0	4.2	167
Water transport (except stevedoring services)	6	0.1	0.5	12
Road transport; Other transport and storage; Communication	6	1.9	2.3	98
Entertainment, recreation, restaurants, hotels and personal services	3	0.3	3.3	137
Other industries (d)	12	6.3	16.1	738
Total	368	69.4	191.0	9,615

(a) Excludes disputes involving cessation of work of less than 10 man-days.

(b) The statistics in this table are compiled on the basis of the *Australian Standard Industrial Classification*, 1978 edition.

(c) Includes workers involved directly and indirectly; those indirectly involved are persons thrown out of work at the establishments where the stoppages occurred, but not themselves parties to the dispute.

(d) Includes Finance, insurance, real estate and business services; Public administration and defence and Community services.

In the two previous tables details of industrial disputes in Western Australia during the years 1975 to 1980 are given, together with an analysis, according to industry group, of disputes which were in progress in 1980. The statistics exclude disputes involving stoppages of work of less than ten man-days in the establishment where the stoppage occurred. Effects on the other establishments resulting from lack of materials, disruption of transport services, power cuts, etc. are not measured by these statistics.

Particulars of all disputes in progress during the year are included in the annual figures, whether the dispute commenced in that year or was in progress at the beginning of the

year. Consequently, details of 'the number of disputes' and 'workers involved' in disputes which commenced in any year, and were still in progress during the following year, are included in the figures for both years.

Particulars of some stoppages (e.g. those involving a large number of establishments) may be estimated and the statistics therefore should be regarded as giving a broad measure of the extent of stoppages of work (as defined).

The table below gives an analysis of disputes which were resolved during 1980, according to duration of stoppages.

### INDUSTRIAL DISPUTES ACCORDING TO DURATION: 1980

Duration (working days)	Mining	Manu- facturing	Con- struction	Steve- doring	Other Industries	All Industries
NUMBER OF DISPUTES (a)						
Up to 1 day	132	6	3	15	8	164
Over 1 and up to 2 days	82	3	1	4	7	97
Over 2 and up to 3 days	25	3	1	3	6	38
Over 3 but less than 5 days	23	1	—	1	2	27
5 to less than 10 days	11	3	3	—	6	23
10 to less than 20 days	4	1	3	—	6	14
20 to less than 40 days	1	1	—	—	—	2
40 days and over	—	—	—	—	—	—
Total	278	18	11	23	35	365
WORKERS INVOLVED (b)						
Up to 1 day	14,334	3,613	2,616	3,849	4,190	28,602
Over 1 and up to 2 days	7,055	4,131	16	831	5,352	17,385
Over 2 and up to 3 days	2,468	1,230	34	243	3,019	6,994
Over 3 but less than 5 days	2,018	28	—	56	2,512	4,614
5 to less than 10 days	4,693	1,634	218	—	309	6,854
10 to less than 20 days	602	103	734	—	2,627	4,066
20 to less than 40 days	41	289	—	—	—	330
40 days and over	—	—	—	—	—	—
Total	31,211	11,028	3,618	4,979	18,009	68,845
WORKING DAYS LOST ('000 MAN-DAYS)						
Up to 1 day	7.7	1.8	2.1	2.3	2.7	16.6
Over 1 and up to 2 days	10.7	5.2	—	1.2	5.9	23.0
Over 2 and up to 3 days	6.7	3.2	—	0.7	9.1	19.6
Over 3 but less than 5 days	6.9	0.1	—	0.2	11.9	19.1
5 to less than 10 days	33.8	11.1	1.4	—	1.7	48.1
10 to less than 20 days	11.1	2.0	11.5	—	32.7	57.2
20 to less than 40 days	1.0	6.1	—	—	—	6.9
40 days and over	—	—	—	—	—	—
Total	77.7	29.5	15.1	4.2	64.0	190.6
ESTIMATED LOSS IN WAGES (\$'000)						
Up to 1 day	434.7	71.3	92.8	88.9	130.9	818.7
Over 1 and up to 2 days	554.8	202.4	1.5	44.5	251.8	1,055.0
Over 2 and up to 3 days	367.1	156.4	3.4	26.7	383.0	936.7
Over 3 but less than 5 days	359.2	6.2	—	6.9	518.0	890.3
5 to less than 10 days	1,929.5	492.3	54.5	—	73.6	2,549.9
10 to less than 20 days	589.8	73.3	749.7	—	1,514.5	2,927.3
20 to less than 40 days	35.5	382.3	—	—	—	417.9
40 days and over	—	—	—	—	—	—
Total	4,270.6	1,384.3	901.9	167.0	2,871.9	9,595.7

(a) Excludes disputes involving cessation of work less than 10 man-days. (b) Includes workers indirectly involved, i.e. persons thrown out of work at the establishments where the stoppages occurred, but not themselves parties to the disputes.

## WAGES AND EARNINGS

**Determination of rates of pay**

The awards and determinations of the various Federal and State tribunals prescribe minimum rates of pay, standard hours of work and other conditions of employment for particular occupations. Most awards also prescribe a minimum wage for adult males and adult females, i.e. the minimum amount which must be paid to an adult employee, regardless of occupation, for working the standard weekly hours of work. In all awards, etc. except those of Western Australian tribunals, the minimum wage is the same amount for adult females and adult males. The concept of equal pay is applied in most Federal and State awards. In recent years the wage-fixing principles of the Australian Conciliation and Arbitration Commission have generally been followed by State tribunals.

In April 1975 the Australian Conciliation and Arbitration Commission decided to introduce wage indexation in the form of quarterly adjustments to award wages based on increases in the Consumer Price Index. These increases were applied to all rates of pay prescribed in awards of the Commission, including rates of minimum wage for adult males and adult females. In addition, a further increase of \$5 per week was added to the minimum wage in April 1976.

State tribunals generally have granted similar wage increases to those of the Australian Conciliation and Arbitration Commission, including wage indexation increases. For details of increases in Federal and State awards and determinations, and for rates of minimum wage for adult males and adult females, see tables in the following pages.

**The Basic Wage**

The State basic wage was abandoned with the repeal of the *Industrial Arbitration Act 1912-1979* on 1 March 1980. An account of adjustments between 1964 and 1974 is provided in the 1976 Year Book and earlier issues. A table showing rates applying at 31 December of each year from 1926 is given in the Statistical Summary following this chapter.

**Minimum Wage Rates**

In its decision on the Basic Wage, Margins and Total Wage Case 1966, the Australian Conciliation and Arbitration Commission decided that adult male employees covered by Federal awards should receive a minimum wage of \$36.55 from 11 July 1966.

In its decision in the National Wage Case 1974, the Australian Conciliation and Arbitration Commission, in prescribing a minimum wage for adult females, also made provision for parity between the minimum wage for adult males and adult females to be achieved in three stages: 85 per cent of the male minimum wage to be paid to adult females from the beginning of the first pay-period commencing on or after 23 May 1974; 90 per cent from the beginning of the pay-period in which 30 September 1974 falls; and 100 per cent from the beginning of the pay-period in which 30 June 1975 occurs. The minimum weekly wage payable to adult males was increased from \$60.10 to \$68.10 with effect from the beginning of the first pay-period commencing on or after 23 May 1974. The minimum weekly wage payable to adult females from that date was therefore \$57.90 (i.e.  $0.85 \times \$68.10$ ).

The Western Australian Industrial Commission adopted the minimum wage concept in 1967 when it determined a minimum wage of \$36.55, with effect from 5 April 1967, in respect of adult males employed under specified awards and agreements. In terms of orders operative from 31 May 1974, the Commission introduced for adult females employed under specified awards and agreements a minimum wage of \$57.90 per week.

The following table shows variations in the minimum weekly wage rates applicable to adult workers under Federal and State awards. Between July 1966 and January 1981, the minimum weekly wage rate prescribed in Federal awards for adult male workers in Perth increased from \$36.55 to \$139.90.

MINIMUM WEEKLY WAGE RATES  
FEDERAL AND STATE AWARDS  
(\$)

Federal awards		State awards	
Perth		Western Australia	
Date of operation	Amount	Date of operation	Amount
Adult males (a) —		Adult males —	
1966 — 11 July	36.55	1967 — 5 April (a)	36.55
1967 — 1 July	37.55	1 July (a)	37.55
1968 — 25 October	38.90	1968 — 25 October (a)	38.90
1969 — 19 December	42.40	1969 — 19 December (a)	42.40
1971 — 1 January	46.40	1970 — 26 October	49.00
1972 — 19 May	51.10	1971 — 26 October	51.50
1973 — 29 May	60.10	1972 — 26 June	53.50
1974 — 23 May	68.10	1973 — 8 June	57.00
1975 — 1 January	76.10	17 September	61.50
15 May	80.10	1974 — 31 May	69.00
Adult females (b) —		1975 — 1 May (a)	82.50
1974 — 23 May	57.90	1976 — 15 May (a)	94.20
30 September (c)	61.30	15 August (a) (e)	97.40
1975 — 1 January	68.50	15 November (a) (e)	99.80
15 May	72.10	1977 — 15 February (a) (e)	106.40
30 June (d)	80.10	15 May (a) (e)	108.80
Adult males and females (a) —		15 August (a) (e)	111.40
1975 — 18 September	82.90	29 December (a)	114.10
1976 — 15 February	88.20	1978 — 28 February	116.90
1 April	93.20	7 June	118.30
15 May	96.00	12 December	123.00
15 August	98.50	1979 — 27 June	126.90
22 November	100.70	1980 — 4 January	132.60
1977 — 31 March	106.40	14 July	138.20
24 May	108.40	1981 — 9 January	143.30
22 August	110.60	Adult females —	
12 December	112.30	1974 — 31 May	57.90
1978 — 28 February	114.00	1975 — 1 May (a)	72.10
7 June	115.00	30 June (a)	80.10
12 December	120.10	1976 — 15 May (a)	91.50
1979 — 27 June	123.90	15 August (a) (e)	94.60
1980 — 4 January	129.50	15 November (a) (e)	97.00
14 July	134.90	1977 — 15 February (a) (e)	103.60
1981 — 9 January	139.90	15 May (a) (e)	106.00
		15 August (a) (e)	108.60
		29 December (a)	111.20
		1978 — 28 February	114.00
		7 June	115.50
		12 December	120.10
		1979 — 27 June	123.90
		1980 — 4 January	129.50
		14 July	134.90
		1981 — 9 January	139.90

(a) Rates operative from beginning of first pay-period commencing on or after the date shown. (b) Rates operative from beginning of first pay-period commencing on or after the date shown, except as indicated in footnotes (c) and (d). (c) Rate payable from beginning of pay-period in which 30 September 1974 occurred. (d) Rate payable from beginning of pay-period in which 30 June 1975 occurred. (e) Subject to application to The Western Australian Industrial Commission to amend an award or agreement.

The statistics shown in the following table, which refers to Western Australian experience, relate generally to wages and hours prescribed in awards or determinations of the Federal and State industrial authorities or in agreements registered with them.

The minimum wage rates and index numbers shown in the table embrace a representative range of occupations and are based on the occupation and industry structures in Australia in 1954. The weekly wage rates given in the table, and used in the compilation of the indexes, represent the lowest rates payable for a full week's work (excluding overtime), as prescribed in representative industrial awards, determinations and agreements. The hourly wage rates are obtained by relating the weekly wage rates and the weekly hours of work prescribed in awards, etc. The rural industries are excluded from the table because of coverage difficulties.

Because the indexes are designed to measure movements in prescribed minimum rates of 'wages' as distinct from 'salaries', those awards, determinations and agreements which relate solely or mainly to salary-earners are excluded.

#### WEIGHTED AVERAGE MINIMUM WEEKLY AND HOURLY WAGE RATES

Date	Weekly wage rates		Hourly wage rates		Index numbers (a)			
	Adult males	Adult females (b)	Adult males (c)	Adult females (b)	Weekly wage rates		Hourly wage rates	
					Males	Females (b)	Males (c)	Females (b)
End of June —	\$	\$	cents	cents				
1975	106.35	98.29	264.31	247.07	376.6	493.7	373.6	492.5
1976	125.89	115.34	313.73	289.92	445.7	579.4	443.4	577.9
1977	141.99	131.85	354.19	331.42	502.8	662.3	500.6	660.6
1978	152.65	141.06	381.09	354.57	540.5	708.6	538.6	706.7
1979 r	163.71	151.59	408.73	381.04	579.7	761.5	577.7	759.5
1980	175.20	159.90	437.44	401.92	620.4	803.2	618.3	801.1

(a) Base of series: weighted average weekly wage rate — Australia, 1954 = 100. (b) Excludes mining and quarrying and building and construction. (c) Excludes shipping and stevedoring.

The wage rates shown should not be regarded as actual current averages, but as indexes expressed in money terms, indicative of trends.

A more detailed description of the minimum wage rates index and more extensive tables are published by the Australian Statistician, Canberra in the monthly bulletin *Wage Rates* (Catalogue No. 6312.0).

#### Wage Indexation

In its National Wage decision of 30 April 1975, the Australian Conciliation and Arbitration Commission approved wage indexation, i.e. the adjustment of award wage and salary rates in accordance with changes in the Consumer Price Index (see section *The Consumer Price Index* in Part 3 of this Chapter) in principle, but only if applied in conjunction with 'appropriate wage fixing principles and the necessary "supporting mechanisms" to ensure their viability'. The Commission laid down eight principles of wage determination, and a prime consideration in subsequent decisions has been 'whether there has been substantial compliance with the principles'.

The Western Australian Industrial Commission, in its decision of 1 July 1975, adopted full wage indexation for a trial period relating to movements in the Consumer Price Index for the March, June, September and December 1975 quarters. Full indexation was subsequently granted also in respect of the March 1976 quarter. However, the Commission, in its decision of 20 August 1976, stated that 'the economic opinions put before us . . . lead us to conclude that the automatic quarterly adjustment of all wages and salaries in accordance with movements in the Consumer Price Index is not sustainable indefinitely as a feature of our wage fixing system without generating inflation, or unemployment, or both'. In that and subsequent decisions the Commission granted an increase which amounted to less than full indexation.

In September 1978 the Australian Conciliation and Arbitration Commission examined the system which had existed since April 1975 and made some changes to the existing principles.

Following the completion of the Wage Fixation Principles Inquiry, a Full Bench of the Commission decided on 14 September 1978 to hold future wage indexation hearings each six months.

In its decision of 27 June 1979, the Commission stated its belief that the system of wage fixation based on indexation was not working and in the National Wage decision the Full Bench called a conference of all parties and interveners to consider whether indexation had a future. The final conference was held on 18 September 1979 and subsequently it was reported that while there was generally a desire for the continuance of a centralised system of wage fixation, significant differences existed as to the basis on which such a system should



operate. The Full Bench determined that further debate on the future of the centralised system would be most appropriately dealt with in the context of the following six-monthly review. In the meantime the existing principles would be applied.

The following table shows details of wage indexation increases granted by the Australian Conciliation and Arbitration Commission in respect of Federal awards, and The Western Australian Industrial Commission in respect of State awards.

#### WAGE INDEXATION INCREASES

Federal awards		State awards	
Date operative (a)	Increase (per week)	Date operative (a)	Increase (per week)
1975 — 15 May	3.6%	1975 — 15 May	3.6%
18 September	3.5%	15 August	3.5%
1976 — 15 February	6.4%	1976 — 15 February	6.4%
15 May	(b) 3.0%	15 May	3.0%
15 August	(c) 1.5%	15 August	(c) 1.5%
22 November	2.2%	15 November	2.2%
1977 — 31 March	\$5.70	1977 — 15 February	\$6.60
24 May	(d) 1.9%	15 May	\$2.40
22 August	2.0%	15 August	\$2.60
12 December	1.5%	29 December	(e) 1.5%
1978 — 28 February	(f) 1.5%	1978 — 28 February	(f) 1.5%
7 June	1.3%	7 June	1.3%
12 December	4.0%	12 December	4.0%
1979 — 27 June	3.2%	1979 — 27 June	3.2%
1980 — 4 January	4.5%	1980 — 4 January	4.5%
14 July	4.2%	14 July	4.2%
1981 — 9 January	3.7%	1981 — 9 January	3.7%

(a) Operative from the beginning of the first pay-period commencing on or after the date shown.

(b) Increase of 3 per cent up to a maximum of \$3.80 per week.

(c) Increase of \$2.50 for wage rates up to \$166 per week and 1.5 per cent for wage rates over \$166 per week.

(d) Increase of 1.9 per cent up to a maximum of \$3.80 per week.

(e) Increase of \$2.10 for wage rates up to \$140 per week and 1.5 per cent for wage rates over \$140 per week.

(f) Increase of 1.5 per cent up to a maximum of \$2.60 per week.

On 4 January 1980, in connection with the National Wage Case for the June and September quarters 1979 the Full Bench decided to continue with the system at least for the time being. On 28 March 1980 it was decided to continue the form of the principles with certain modifications. It was also decided that a further review of wage-fixing principles would be worthwhile.

On 9 January 1981, the Commission announced that the system of wage fixation and its principles had broken down and called on all participants in wage fixation to apply themselves to the task of finding another course which offered prospects for overcoming the various difficulties which had brought down that system.

At the conclusion of a conference held on 19 January 1981, the President issued a statement which in part reads, 'I have concluded that in the public interest a public inquiry into the principles of wage fixation should be commenced at the earliest convenient date in February'.

As a result of the public inquiry the Commission, on 7 April 1981, announced new principles to be taken into account in wage determination; these principles are summarised below.

The National Wage Adjustment will be subject to two reviews annually. In the first review, upon publication of the March quarter Consumer Price Index, other than in exceptional and compelling circumstances, the Commission will adjust its award wages and salaries for 80 per cent of the December and March quarterly movements in the six State capital cities Consumer Price Index.

In the second and final review, upon publication of the September quarter Consumer Price Index, the Commission will give consideration to adjusting its award wages and salaries for:

- (i) the 20 per cent remaining from the December and March quarterly movements in the six State capital cities Consumer Price Index,

- (ii) the total June and September quarterly movements in the six State capital cities Consumer Price Index, and
- (iii) productivity movement.

In addition to the above increases the only other grounds which will justify increases in wages or salaries are changes in work value, anomalies, inequities and in special circumstances changes in allowances.

### Average Weekly Earnings

Statistics of average weekly earnings are derived from information concerning employment and wages and salaries as recorded on pay-roll tax returns, from other direct collections, and from estimates of the unrecorded balance. The figures relate to civilians only.

Particulars of wages and salaries paid are not available separately for males and females from these sources. Average weekly earnings have therefore been calculated for each State in terms of male units, i.e. total male employees plus a proportion of female employees, the proportion being determined by the estimated ratio of female to male average earnings.

The figures used in calculating the averages shown in the following table comprise: award and over-award wages and salaries; earnings of employees not covered by awards; overtime earnings; bonuses and allowances; commissions; directors' fees; and payments made retrospectively or in advance during the years specified. Earnings of part-time as well as full-time employees, and of juniors as well as adults, are included. *It is important to bear in mind that the figures relate to the whole civilian wage and salary earner field and therefore comprise payments to all grades of employees from junior workers to persons at the highest levels of executive and administrative activity.*

AVERAGE WEEKLY EARNINGS PER EMPLOYED MALE UNIT  
AUSTRALIAN STATES AND TERRITORIES  
(\$)

Year	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Northern Territory	Australian Capital Territory	Australia
1975-76	172.70	170.50	163.50	158.50	169.10	157.80	190.00	209.00	169.60
1976-77	193.60	191.10	184.50	179.50	190.80	181.20	216.70	237.70	190.70
1977-78	213.40	209.30	202.20	197.40	209.20	199.00	240.70	259.10	209.50
1978-79	230.20	226.60	217.80	210.30	223.30	211.60	r 259.60	279.50	r 225.60
1979-80	254.40	248.80	234.40	230.30	245.30	237.90	290.10	303.00	247.90
1980-81	288.40	280.60	269.80	262.10	279.10	271.00	344.10	337.50	281.40

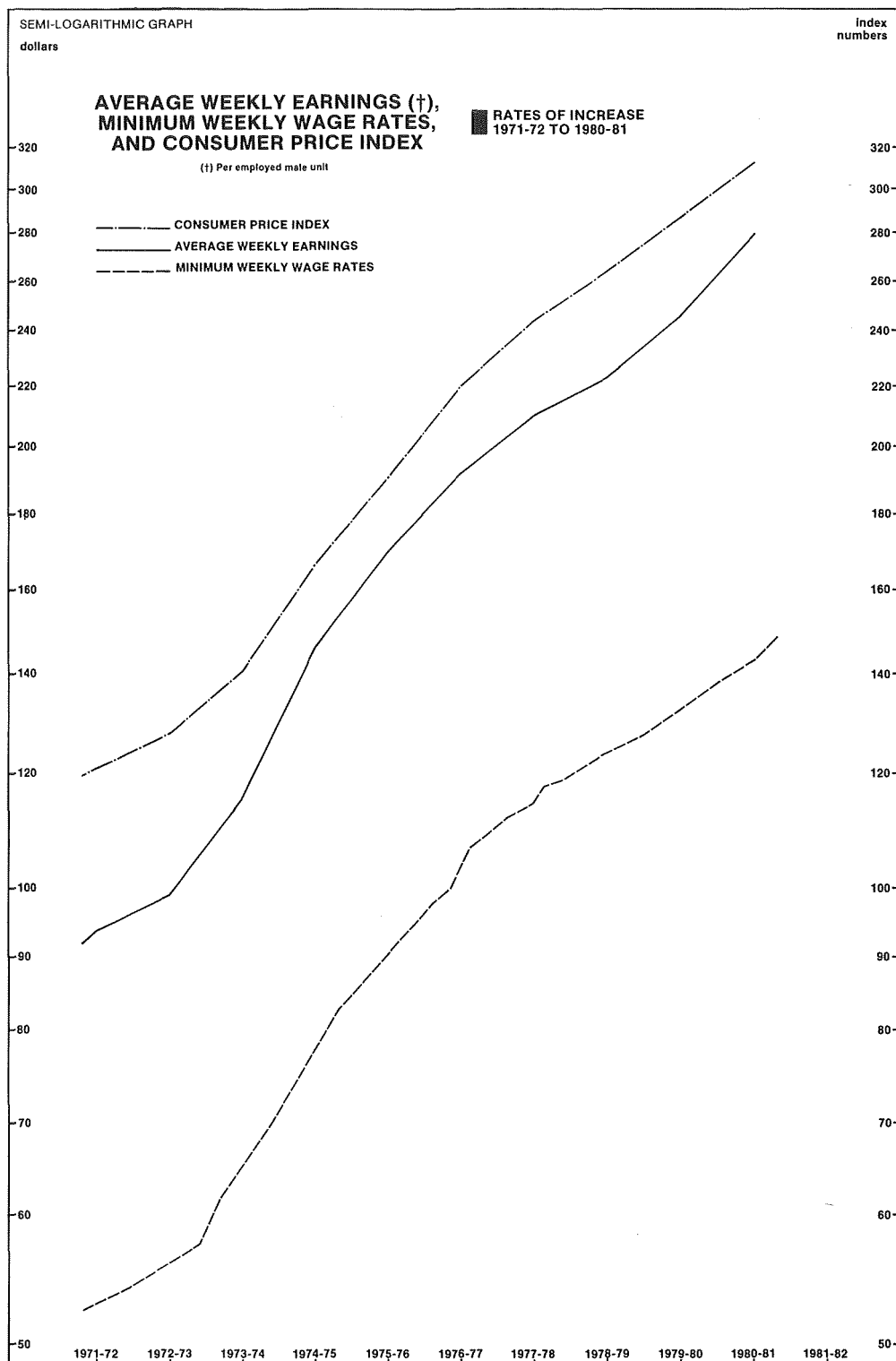
Quarterly figures corresponding to those shown in the above table are published by the Australian Statistician in the bulletins *Average Weekly Earnings* (Catalogue No. 6302.0) and the *Monthly Summary of Statistics, Australia* (Catalogue No. 1304.0).

### SURVEYS OF EARNINGS AND HOURS

Statistics of earnings and hours are collected by means of a stratified random sample of most private employers subject to pay-roll tax and, either complete enumeration or stratified random sample of Commonwealth, State and local government employers. At the time of the selection of the sample for the 1980 Survey pay-roll tax was payable by employers paying more than \$72,000 per year in wages and salaries.

In addition to obtaining data for the calculation of average weekly earnings, average weekly hours paid for, and average hourly earnings, the surveys obtain information on overtime and ordinary-time earnings and hours for full-time employees (other than managerial, etc. staff).

Definitions of the terms used in the following tables may be found in the publications *Earnings and Hours of Employees, October 1980* (Catalogue No. 6304.0) and *Earnings and Hours of Employees — Distribution and Composition, May 1980* (Catalogue No. 6306.0), published by the Australian Statistician, Canberra. The following tables refer to survey results for Western Australia. It should be noted that changes in pay-roll tax exemption levels may affect the comparability of survey results for different years.



**AVERAGE EARNINGS AND HOURS — FULL-TIME NON-MANAGERIAL EMPLOYEES  
ALL INDUSTRY GROUPS (a)**

Particulars	October —					
	1975	1976	1977	1978	1979	1980
<b>PRIVATE EMPLOYEES</b>						
Average weekly earnings —	\$	\$	\$	\$	\$	\$
Adult males	169.90	190.70	215.40	226.50	251.40	282.90
Junior males	81.50	96.10	107.00	112.80	127.50	140.50
Adult females	121.50	139.40	151.70	159.50	175.30	193.80
Junior females	78.50	93.60	99.70	104.40	114.20	125.60
Average weekly hours paid for —	hrs	hrs	hrs	hrs	hrs	hrs
Adult males	42.3	42.4	42.5	42.0	42.3	42.5
Junior males	40.4	40.3	40.7	40.3	40.9	41.6
Adult females	39.0	39.0	39.1	38.9	39.4	38.8
Junior females	39.1	39.3	39.1	39.2	39.4	39.6
Average hourly earnings —	\$	\$	\$	\$	\$	\$
Adult males	4.02	4.50	5.07	5.39	5.95	6.66
Junior males	2.02	2.38	2.63	2.79	3.12	3.38
Adult females	3.12	3.57	3.88	4.10	4.44	5.00
Junior females	2.01	2.38	2.55	2.66	2.90	3.17
<b>TOTAL (PRIVATE AND GOVERNMENT) EMPLOYEES</b>						
Average weekly earnings —	\$	\$	\$	\$	\$	\$
Adult males	168.60	190.40	214.20	223.30	242.40	280.50
Junior males	84.40	98.40	110.00	116.20	128.10	144.10
Adult females	130.90	149.50	166.50	174.20	193.70	216.50
Junior females	79.90	94.50	104.40	109.00	119.00	132.60
Average weekly hours paid for —	hrs	hrs	hrs	hrs	hrs	hrs
Adult males	41.4	41.4	41.6	40.9	41.1	41.5
Junior males	39.9	39.9	40.1	39.8	40.3	41.0
Adult females	38.7	38.8	38.6	38.5	38.8	38.5
Junior females	39.0	39.1	38.9	38.9	39.1	39.3
Average hourly earnings —	\$	\$	\$	\$	\$	\$
Adult males	4.07	4.60	5.15	5.46	5.89	6.76
Junior males	2.12	2.47	2.74	2.92	3.18	3.52
Adult females	3.38	3.85	4.31	4.53	4.99	5.62
Junior females	2.05	2.42	2.68	2.80	3.04	3.37

(a) See text below for employees excluded.

**AVERAGE WEEKLY OVERTIME AND ORDINARY-TIME EARNINGS  
FULL-TIME NON-MANAGERIAL EMPLOYEES (a): OCTOBER 1980  
(\$)**

Particulars	Average weekly overtime earnings	Average weekly ordinary-time earnings	Average weekly total earnings
<b>PRIVATE EMPLOYEES</b>			
Adult males —			
Manufacturing —			
Metal products, machinery and equipment	40.70	232.60	273.30
Other	34.80	225.80	260.60
Total, Manufacturing	37.30	228.70	265.90
Non-manufacturing	43.70	249.30	293.00
All industry groups	41.30	241.60	282.90
Junior males — all industry groups	10.50	130.00	140.50
Females — all industry groups —			
Adult	5.50	188.30	193.80
Junior	2.40	123.20	125.60
<b>TOTAL (PRIVATE AND GOVERNMENT) EMPLOYEES</b>			
Adult males —			
Manufacturing —			
Metal products, machinery and equipment	37.70	229.70	267.40
Other	34.60	225.70	260.30
Total, Manufacturing	36.00	227.60	263.60
Non-manufacturing	30.40	255.80	286.20
All industry groups	31.80	248.80	280.50
Junior males — all industry groups	9.30	134.80	144.10
Females — all industry groups —			
Adult	4.20	212.30	216.50
Junior	2.00	130.60	132.60

(a) Averages for all employees represented in the surveys. See text below for employees excluded.

All wage and salary earners are represented in the survey except members of defence forces, employees in agriculture, private households employing staff, waterside workers on a casual basis, persons employed by private employers (other than hospitals) not subject to pay-roll tax, and employees on workers' compensation. Excluded from the surveys are employees of religious, benevolent and other similar organisations exempt from pay-roll tax.

### HOURS OF WORK AND LEAVE PROVISIONS

**Standard Hours of Work.** In the fixation of weekly wage rates most industrial tribunals prescribe the number of hours constituting a full week's work for the wages specified.

The forty-hour week has operated in Australia generally from 1 January 1948 (in New South Wales from 1 July 1947). However, the number of hours constituting a full week's work (excluding overtime) differs between occupations and/or between States. The weighted average standard hours of work (excluding overtime) prescribed in awards, determinations and agreements for a full working week, in respect of adult male workers in all industry groups except rural, and shipping and stevedoring, at 31 December 1980 are shown in the following table.

STANDARD HOURS OF WORK AT 31 DECEMBER 1980

Area	Weighted average standard hours	
	Adult males	Adult females
New South Wales	39.68	39.53
Victoria	39.90	39.81
Queensland	39.82	39.70
South Australia	39.90	39.77
Western Australia	39.77	39.78
Tasmania	39.87	39.63
Australia	39.79	39.67

Following a general inquiry concerning annual leave and public holidays, the Western Australian Court of Arbitration in June 1963 adopted three weeks as the standard for the normal period of annual leave in State awards, with four weeks for seven-day shift workers. Existing awards and agreements which already provided annual leave in excess of this standard were to be examined separately to ascertain whether special circumstances existed to justify leave greater than the normal standard.

In the inquiry the State Government sought a reduction in the number of public holidays and a review of other conditions where these were more favourable than the Court's standard. Private employers opposed any increase in annual leave but, alternatively, submitted that, if there was to be an increase, then the new standard should be two weeks and four days per annum or the number of public holidays in each year should be reduced by one. Both these submissions were rejected and the standard number of public holidays was retained at ten with the provision that, where an award provided for more than ten public holidays a year, that award, unless the union consented to a reduction to ten, would be excluded from the order amending the annual leave provisions until it was established that special circumstances justified the continuance of the greater number of holidays.

In November, 1963 the Court refused an application by employers for the right to split the annual leave into two parts, since it decided to follow the decision of most other State tribunals and allow the additional leave in conformity with conditions similar to those prescribed by the Australian Conciliation and Arbitration Commission. The right to split the leave would be allowed by the Court only in exceptional circumstances, unless all the parties concerned agreed to the inclusion of such a provision.

As from 1 January 1973, employees of the Commonwealth Government and the State Government were granted four weeks' paid annual leave, together with an annual leave loading of 17.5 per cent of their weekly salary, up to a specified maximum amount. Subsequently, these entitlements were extended to most awards and agreements so that most employees now receive at least four weeks' paid annual leave and an annual leave loading payment.

**Long Service Leave.** The *Long Service Leave Act 1958-1973* (State) confers entitlement to long service leave with pay on employees for whom such leave is not otherwise provided. Entitlement accrues only in relation to continuous service with one employer, but continuity of service is not affected by the transfer of a business from one employer to another. Leave of thirteen weeks on ordinary pay is granted in respect of the first fifteen years of service. For each subsequent ten years the entitlement is eight and two-thirds weeks, with *pro rata* conditions applying in the case of termination of employment for any reason other than serious misconduct. An employee who has completed at least ten years' service but less than fifteen years is entitled to *pro rata* leave, on the basis of thirteen weeks for fifteen years, if his employment is terminated by the employer for any reason other than serious misconduct; or by the employee on account of sickness, injury, or domestic or other pressing necessity. An employee forfeits his right to long service leave if he engages in alternative employment for reward during the period of leave. In the case of termination by death of an employee payment in lieu of leave may be made to his personal representative.

The *Long Service Leave Act Amendment Act 1973* which came into operation on 1 March 1974, provides that the 'standard' period of thirteen weeks' leave after fifteen years' service may be varied as the result of an agreement between The Confederation of Western Australian Industry (Incorporated) and the Trades and Labor Council of Western Australia or by a determination of The Western Australian Industrial Commission in Court Session.

### WORKERS' COMPENSATION

The *Workers' Compensation Act 1912-1979* (State) provides compensation to workers in Western Australia for injuries suffered in the course of their employment, for death resulting from such injuries, and for disabilities due to specified industrial diseases associated with their employment. The provisions of the Act do not extend to employees of the Commonwealth Government, for whom compensation is provided by the *Compensation (Commonwealth Government Employees) Act 1971*.

Every employer, other than a self insurer, is required to effect insurance with an approved insurer for the full amount of the liability to pay compensation under the Act to all workers in his employment.

The Act establishes a Workers' Compensation Board of three members, including a chairman, appointed by the Governor. The Chairman, who has the status of Judge, must be a legal practitioner of not less than eight years' practice and standing. Of the remaining members, one is nominated by The Confederation of Western Australian Industry (Incorporated), and one by the Trades and Labor Council of Western Australia. The Board has exclusive jurisdiction to inquire into, hear, and determine all questions and matters arising under the Act, and its actions and decisions are final, except that where any question of law arises in any proceedings before the Board, it may state a case for the decision of the Full Court of the Supreme Court. - The Act also provides that a Supplementary Workers' Compensation Board may be appointed by the Governor if he is satisfied the Board is unable to deal expeditiously with all its business.

The amounts of payments, allowances and benefits under the Act are calculated by reference to a 'prescribed amount' as defined in section 5 of the Act. The prescribed amount is the sum ascertained by multiplying by 208 the estimate, as published each year by the Australian Statistician, of the seasonally adjusted average weekly earnings per employed male unit for the

March quarter in Western Australia. In the following paragraphs the amounts shown are those which were in operation at 1 July 1980, the prescribed amount at that date being \$51,646.

Where total incapacity for work results from the injury, the weekly payment is an amount equal to the weekly earnings, as defined, which the worker would have received had he not been incapacitated. Where the work being performed by the injured person is subject to an industrial award or agreement, weekly earnings are taken as the total wages, salary or other remuneration (excluding overtime and allowances but including over-award payments) payable, at the time of the incapacity, for a week's work under that award or agreement. Where the work is not subject to an industrial award or agreement, or where it is subject to a system of payment by results, weekly earnings are taken as the total wages, salary or other remuneration (excluding overtime and allowances but including over-award payments) under a relevant industrial award or agreement which can be fairly applied to that type of work. In the case of partial incapacity the weekly payment is the amount by which the weekly earnings so computed exceed the weekly amount which the worker is earning or is able to earn in some suitable employment or business after the accident.

The total liability of the employer in respect of weekly payments is limited to \$51,646. Additional compensation is payable up to a maximum of 10 per cent of the prescribed amount, i.e. \$5,164.60 (or more, if the Board finds that, in particular circumstances, this amount is inadequate) for expenses incurred in respect of first aid and ambulance services, medicines, medical or surgical attendance, hospital treatment and the like. In the event of the death of the worker, funeral expenses are compensable up to a maximum of \$500.

The Act provides for compensation in the form of a lump-sum payment, up to a maximum of \$51,646, in respect of specified injuries resulting in such disabilities as loss of sight, hearing or mental powers, or loss of a limb or limbs. Lump-sum payments are made only by election of the injured worker, after which all right to weekly payment ceases.

Where death results from the injury and the worker leaves any dependants who were wholly dependent on his earnings, the maximum amount of compensation is 85 per cent of the prescribed amount, i.e. \$43,899.10, together with an additional weekly payment of \$7.50 in respect of each dependent child or step-child. It is provided that if a worker leaves a widow, a mother, or a child or step-child wholly dependent on his earnings, the minimum payment shall be 25 per cent of the prescribed amount, i.e. \$12,911.50. If a worker dies leaving no dependants, reasonable expenses in connection with medical attendance and burial are payable to the person by whom the expenses were properly incurred.

Disability or death caused by certain specified industrial diseases due to the nature of a worker's employment is compensable at the same rates and under the same conditions as those applying in the case of injury.

### INDUSTRIAL ACCIDENTS

Statistics of industrial accidents in Western Australia are compiled on two bases, namely (i) those which resulted in absence from work for one day or more, and (ii) those which resulted in absence from work for one week or more.

The statistics contained in the following tables are derived from details of claims for workers' compensation paid by insurers and self-insurers. They relate to claims *reported to have been closed* during the year ended 30 June 1980. Figures for 1979-80 are not comparable with those for earlier years. For detailed explanation see the publications *Industrial Accidents* (Catalogue Nos. 6301.5 and 6302.5).

The figures do not represent all industrial accidents which actually occurred during the year because: (i) they refer to claims closed; (ii) in the case of non-fatal accidents, they include only those which resulted in absence from work for one day or more (or one week or more); (iii) only accidents coming within the scope of the *Workers' Compensation Act 1912-1979* are included in

the statistics, which therefore exclude industrial accidents resulting in the death of, or injury to, self-employed persons and persons employed by the Commonwealth Government. (Compensation for Commonwealth Government employees is provided by the *Compensation (Commonwealth Government Employees) Act 1971*.); and (iv) the statistics include only accidents occurring at work site or in the course of the worker's normal duties and do not therefore include 'journey' cases, i.e. death of, or injury to, an employee while travelling between his place of residence and the place of employment. During the year ended 30 June 1980, 781 claims were reported closed in respect of 'journey' cases resulting in absence from work for one day or more, the total time lost being 3,608 weeks and the cost of claims, \$839,374. In respect of 'journey' cases resulting in absence from work for one week or more, 444 cases were reported closed. The total time lost was 3,472 weeks and the cost of claims was \$740,566.

The statistics relate only to accidents, and particulars of cases of industrial disease are therefore excluded.

For the purpose of these statistics, each claim is treated as a separate industrial accident and data are prepared from details of claims reported closed during the year under review (in this instance, the year ended 30 June 1980). In respect of reopened claims, the additional time lost and additional costs are included in the tables but, to avoid duplication, such cases have been excluded from the numbers of accidents shown.

The following definitions should be borne in mind when considering the data shown in the tables. *Cost of claims* means the *total* amount of payments made (principally in the form of compensation for loss of wages, and for medical and hospital expenses, and lump sum settlements) in respect of claims reported closed during the year. The figures do not therefore necessarily represent amounts actually paid in the year under review. *Time lost* means the *total* time lost (i.e. from date of injury) in respect of claims reported closed during the year. The term is therefore not necessarily restricted to time lost during the year under review, since the accident may have occurred in an earlier year.

Statistics in greater detail, as well as analyses according to additional characteristics, are available in the publications, *Industrial Accidents (Series A)* (Catalogue No. 6301.5), which relates to accidents resulting in death or absence from work for one day or more, and *Industrial Accidents (Series B)* (Catalogue No. 6302.5), relating to accidents resulting in death or absence from work for one week or more. These publications are issued annually by the Western Australian Office of the Australian Bureau of Statistics.

Details of the number of industrial accidents, cost of claims and time lost are shown in the next table for the year 1979-80.

## INDUSTRIAL ACCIDENTS: 1979-80

Particulars		Accidents resulting in absence from work for —					
		One day or more			One week or more		
		Males	Females	Persons	Males	Females	Persons
Fatal accidents —							
Number		1	—	1	1	—	1
Cost of claims (a) —							
Total	\$'000	35	—	35	35	—	35
Average per accident	\$	35,292	—	35,292	35,292	—	35,292
Non-fatal accidents —							
Number		25,196	3,234	28,430	13,984	1,810	15,794
Cost of claims (a) —							
Total	\$'000	27,209	3,287	30,496	25,466	3,061	28,526
Average per accident	\$	1,080	1,016	1,073	1,821	1,691	1,806
Time lost (a) —							
Total	weeks	87,457	12,872	100,329	82,020	12,179	94,198
Total per accident	weeks	3.5	4.0	3.5	5.9	6.7	6.0

(a) See definitions above.



The following table give details of fatal and non-fatal industrial accidents for 1979-80 according to broad industry groups.

### INDUSTRIAL ACCIDENTS — INDUSTRY GROUPS: 1979-80

Industry group	Fatal accidents		Non-fatal accidents			
	Number	Cost of claims (a) (\$'000)	Number	Per cent of total	Cost of claims (a) (\$'000)	Time lost (a) weeks
TIME LOST — ONE DAY OR MORE						
Agriculture, forestry, fishing and hunting	1	35	1,023	3.6	925	3,527
Mining	—	—	2,460	8.7	3,328	9,687
Manufacturing	—	—	9,642	33.9	9,589	30,831
Electricity, gas and water	—	—	629	2.2	812	2,541
Construction	—	—	3,979	14.0	5,492	17,332
Wholesale and retail trade	—	—	3,779	13.3	3,328	11,622
Transport and storage	—	—	2,142	7.5	2,479	8,522
Finance, insurance, real estate and business services	—	—	403	1.4	541	1,690
Community services	—	—	2,510	8.8	2,288	8,711
Entertainment, recreation, restaurants, hotels, etc.	—	—	923	3.2	1,091	3,849
Other industries	—	—	940	3.3	623	2,017
Total	1	35	28,430	100.0	30,496	100,329
TIME LOST — ONE WEEK OR MORE						
Agriculture, forestry, fishing and hunting	1	35	733	4.6	879	3,368
Mining	—	—	1,410	8.9	3,152	9,199
Manufacturing	—	—	5,014	31.7	8,893	28,594
Electricity, gas and water	—	—	354	2.2	774	2,419
Construction	—	—	2,312	14.6	5,237	16,527
Wholesale and retail trade	—	—	1,970	12.5	3,083	10,723
Transport and storage	—	—	1,280	8.1	2,291	8,082
Finance, insurance, real estate and business services	—	—	191	1.2	509	1,587
Community services	—	—	1,430	9.1	2,097	8,203
Entertainment, recreation, restaurants, hotels, etc.	—	—	607	3.8	1,050	3,692
Other industries	—	—	493	3.1	561	1,805
Total	1	35	15,794	100.0	28,526	94,198

(a) For definitions see text.

The final table in this Part deals with non-fatal accidents and shows the duration of time lost from work by males and females.

### NON-FATAL ACCIDENTS — DURATION OF TIME LOST (a): 1979-80

Duration of time lost	Persons					
	Males		Females		Time lost	
	Number	Time lost (weeks)	Number	Time lost (weeks)	Number	Per cent of total
1 day but under 1 week	11,212	5,438	1,424	693	12,636	6.4
1 week but under 2 weeks	6,502	8,381	807	1,027	7,309	9.7
2 weeks but under 4 weeks	3,554	9,370	492	1,287	4,046	11.0
4 weeks but under 6 weeks	1,331	6,297	161	760	1,492	7.3
6 weeks but under 8 weeks	774	5,215	87	574	861	6.0
8 weeks but under 13 weeks	829	8,163	104	1,062	933	9.6
13 weeks but under 26 weeks	500	8,785	81	1,474	581	10.6
26 weeks but under 52 weeks	237	8,910	41	1,474	278	10.8
52 weeks but under 104 weeks	207	15,200	20	1,352	227	17.1
104 weeks but under 156 weeks	29	3,690	7	913	36	4.8
156 weeks and more	21	4,318	10	2,171	31	6.7
Total	25,196	83,767	3,234	12,787	28,430	100.0

(a) For definitions see text.

## *Chapter X — continued*

### **Part 2 — Employment**

In addition to the employment data appearing in this Part, references to the numbers of persons engaged in particular activities are to be found elsewhere in the Year Book. In Chapter V, for example, Part 1 shows numbers engaged in teaching, Part 3 contains details of hospital staffs, and employment in building appears in Part 5. In Chapter VIII, Part 1 gives employment in fishing, Part 2 provides information on employment at mines, and Part 3 includes tables relating wholly, or in part, to employment in factories. Chapter IX, Part 2 gives numbers employed in retail and selected service establishments, and Part 3 shows numbers engaged in various types of transport undertakings.

#### **THE LABOUR FORCE**

The labour force comprises two categories of persons: those who are employed and those who are unemployed. In the first category are included employers, self-employed persons, wage and salary earners, and unpaid family helpers. Comprehensive details for each State and Territory and for Australia as a whole in respect of persons in the labour force, classified according to industry, occupation and occupational status (i.e. whether employers, self-employed persons, wage and salary earners or unpaid family helpers) and personal characteristics such as age, sex, marital status and birthplace, are obtained only at a general census of population.

In addition to the population censuses, estimates of the labour force are obtained through the population survey, which is now conducted monthly by means of personal interviews at a sample of households throughout Australia. The survey provides particulars of the demographic and labour force characteristics of the population.

Detailed industry estimates for each State and Territory are obtained only in respect of employees, through a monthly collection from employers. These estimates, which exclude employees in agriculture and in private households employing staff, are based on benchmarks established by analysing data from the population census and other relevant sources such as special returns from government bodies and the economic censuses and surveys of the Australian Bureau of Statistics.

#### **The Population Census**

The comprehensive tables resulting from the 1976 Census include detailed analyses of the labour force according to such characteristics as age, marital status, birthplace, occupational status, industry and occupation. Only some of these tables, in condensed form, have been included in this Chapter. The reader requiring additional information is referred to the census bulletins published by the Australian Statistician, Canberra.

## Population classified according to Occupational Status

## OCCUPATIONAL STATUS — CENSUS, 30 JUNE 1976

Occupational status	Males '000	Females '000	Persons '000	Proportion of total population		
				Males Per cent	Females Per cent	Persons Per cent
In labour force —						
Employed —						
Employer	21.8	9.4	31.2	1.9	0.8	2.7
Self-employed	32.9	13.5	46.4	2.9	1.2	4.1
Employee on wage or salary	264.3	143.0	407.3	23.1	12.5	35.6
Helper, unpaid	1.4	6.3	7.7	0.1	0.5	0.7
Total, Employed	320.4	172.3	492.7	28.0	15.0	43.0
Unemployed	11.6	8.7	20.3	1.0	0.8	1.8
Total, In labour force	332.0	181.0	513.0	29.0	15.8	44.8
Not in labour force (15 years of age or more)	81.7	224.5	306.2	7.1	19.6	26.7
Under 15 years of age	167.4	158.2	325.6	14.6	13.8	28.4
TOTAL POPULATION	581.2	563.7	1,144.9	50.8	49.2	100.0

LABOUR FORCE — OCCUPATIONAL STATUS, MARITAL STATUS AND SEX  
CENSUS, 30 JUNE 1976  
(Thousands)

Occupational status	Never married		Now married		Widowed		Other marital status (a)		Total	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
Employer	1.8	0.2	18.9	8.7	0.2	0.2	0.9	0.2	21.8	9.4
Self-employed	4.9	0.4	26.4	12.5	0.3	0.4	1.2	0.2	32.9	13.5
Wage or salary earner	76.1	45.3	173.0	84.2	2.1	3.9	13.0	9.7	264.3	143.0
Helper, unpaid	0.8	0.6	0.5	5.4	0.1	0.2	0.1	0.1	1.4	6.3
Unemployed, looking for first job	1.1	1.3	0.6	0.4	—	—	0.1	0.1	1.9	1.9
Unemployed, other	5.4	3.6	3.3	2.4	0.1	0.1	0.9	0.8	9.7	6.9
Not in labour force	34.2	34.0	38.0	144.0	6.0	34.8	3.6	11.7	81.7	224.5
Total, 15 years and over	124.4	85.4	260.8	257.6	8.8	39.6	19.8	22.8	413.7	405.5

(a) Comprises the categories *Permanently separated* and *Divorced*.

LABOUR FORCE — EMPLOYMENT STATUS, AGE AND SEX  
CENSUS, 30 JUNE 1976  
(Thousands)

Age (years)	Employed		Unemployed		Not in labour force		Total	
	Males	Females	Males	Females	Males	Females	Males	Females
15-19	29.7	23.8	2.6	3.3	21.5	24.7	53.9	51.9
20-24	43.2	29.1	2.8	2.0	5.6	18.5	51.6	49.6
25-29	48.3	22.6	1.5	0.8	2.8	25.8	52.7	49.2
30-34	39.8	18.7	0.9	0.6	1.7	19.7	42.4	39.0
35-39	34.9	19.5	0.8	0.5	1.5	14.7	37.1	34.7
40-44	30.0	16.9	0.7	0.4	1.4	12.2	32.0	29.4
45-49	30.0	16.1	0.7	0.4	1.6	13.0	32.3	29.5
50-54	26.1	12.2	0.6	0.3	2.2	14.5	28.9	26.9
55-59	19.2	7.7	0.4	0.2	2.8	14.8	22.4	22.7
60-64	13.3	3.6	0.4	0.1	6.8	18.3	20.6	22.0
65 and over	6.0	2.2	0.1	0.1	33.8	48.3	39.9	50.6
Total	320.4	172.3	11.6	8.7	81.7	224.5	413.7	405.5

### Classification according to Industry

For census purposes, industry may be defined as the *branch of productive activity, business or service carried out by the establishment in which a person is employed*. It is concerned with the activity of persons, firms or businesses considered as a group producing the same commodity, performing the same process or providing the same service. All persons engaged in any such branch of economic activity are classified industrially as belonging to that particular branch irrespective of their personal occupation within the industry. Examples are: *Mining*, which includes, in addition to miners and prospectors, such persons as laboratory technicians, transport workers and office staff employed by mining companies; *Water Transport*, which covers staff members of shipping companies and agencies, as well as ships' crews; and professional activities such as law and architecture which include not only qualified practitioners but also persons employed by them as, for example, receptionists, law clerks and draftsmen.

Classification according to industry at the 1976 Census has been made on the basis of the 1969 preliminary edition of the *Australian Standard Industrial Classification*, prepared by the Australian Statistician, Canberra. For the Population Census an 'undefined' category was added to certain Divisions of the classification to facilitate the coding of imprecise or generalised descriptions of industrial activities on the census schedules. The classification divides the labour force into thirteen Divisions which are in turn divided into Sub-divisions, Groups and Classes.

In the table below, the employed population is classified according to occupational status within each of the thirteen industry divisions.

EMPLOYED POPULATION — OCCUPATIONAL STATUS AND INDUSTRY  
CENSUS, 30 JUNE 1976  
(Thousands)

Industry division	Occupational status				Total
	Employer	Self-employed	Employee on wage or salary	Helper, unpaid	
MALES					
Agriculture, forestry, fishing and hunting	5.8	13.3	11.4	0.6	31.1
Mining	0.1	0.1	14.9	—	15.0
Manufacturing	1.8	1.5	50.3	—	53.7
Electricity, gas and water	—	—	7.0	—	7.0
Construction	3.3	6.2	28.7	—	38.3
Wholesale and retail trade	5.9	4.7	42.6	0.1	53.3
Transport and storage	0.6	2.4	19.8	—	22.9
Communication	—	—	7.0	—	7.0
Finance, insurance, real estate and business services	1.9	1.8	15.8	—	19.5
Public administration and defence	—	—	18.5	—	18.5
Community services	1.0	0.2	25.7	0.1	27.0
Entertainment, recreation, restaurants, hotels and personal services	1.1	1.3	8.0	—	10.4
Inadequately described and not stated	0.3	1.3	14.5	0.5	16.7
Total males employed	21.8	32.9	264.3	1.4	320.4
FEMALES					
Agriculture, forestry, fishing and hunting	2.7	6.5	2.1	2.1	13.4
Mining	—	—	1.7	—	1.7
Manufacturing	0.6	0.4	11.8	0.1	12.9
Electricity, gas and water	—	—	0.3	—	0.3
Construction	0.8	0.9	2.0	0.1	3.8
Wholesale and retail trade	3.2	2.7	30.6	0.3	36.8
Transport and storage	0.2	0.5	2.5	0.1	3.2
Communication	—	—	2.3	—	2.3
Finance, insurance, real estate and business services	0.4	0.8	13.7	0.1	15.0
Public administration and defence	—	—	6.7	—	6.7
Community services	0.2	0.2	45.1	0.1	45.5
Entertainment, recreation, restaurants, hotels and personal services	0.9	0.7	13.6	0.1	15.4
Inadequately described and not stated	0.3	0.9	10.8	3.3	15.2
Total females employed	9.4	13.5	143.0	6.3	172.3

## EMPLOYED POPULATION — INDUSTRY: CENSUS, 30 JUNE 1976

Industry division and sub-division (a)	Males '000	Females '000	Persons	
			Number '000	Per cent of total
Agriculture, forestry, fishing and hunting —				
Agriculture	27.1	12.8	40.0	8.1
Other and undefined	3.9	0.6	4.5	0.9
Total, Agriculture, forestry, fishing and hunting	31.1	13.4	44.5	9.0
Mining —				
Metallic minerals	11.2	1.2	12.4	2.5
Other and undefined	3.9	0.5	4.4	0.9
Total, Mining	15.0	1.7	16.7	3.4
Manufacturing —				
Food, beverages and tobacco	9.2	3.9	13.1	2.7
Wood, wood products and furniture (except sheet metal)	7.2	1.4	8.6	1.7
Paper and paper products, printing and publishing	3.9	1.6	5.4	1.1
Glass, clay and other non-metallic mineral products	4.8	0.4	5.3	1.1
Basic metal products	5.8	0.4	6.1	1.2
Fabricated metal products	6.9	1.1	8.0	1.6
Other industrial machinery and equipment and household appliances	6.1	1.0	7.1	1.4
Other and undefined	9.8	3.1	13.0	2.6
Total, Manufacturing	53.7	12.9	66.6	13.5
Electricity, gas and water	7.0	0.3	7.4	1.5
Construction —				
General construction	22.2	2.0	24.2	4.9
Special trade contracting	13.7	1.6	15.3	3.1
Total, Construction (b)	38.3	3.8	42.1	8.5
Wholesale and retail trade —				
Wholesale trade	22.5	8.6	31.1	6.3
Retail trade	30.7	28.2	58.8	11.9
Total, Wholesale and retail trade (b)	53.3	36.8	90.1	18.3
Transport and storage —				
Road transport	9.4	1.6	11.0	2.2
Railway transport	5.7	0.3	5.9	1.2
Other and undefined	7.9	1.3	9.2	1.9
Total, Transport and storage	22.9	3.2	26.1	5.3
Communication	7.0	2.3	9.3	1.9
Finance, insurance, real estate and business services —				
Finance and investment	5.6	5.2	10.7	2.2
Real estate and business services	11.3	7.8	19.2	3.9
Other and undefined	2.6	2.0	4.6	0.9
Total, Finance, insurance, real estate and business services	19.5	15.0	34.5	7.0
Public administration and defence —				
Public administration	15.0	6.3	21.3	4.3
Other and undefined	3.5	0.4	3.9	0.8
Total, Public administration and defence	18.5	6.7	25.1	5.1
Community services —				
Health	7.6	23.9	31.5	6.4
Education, libraries, museums and art galleries	12.0	17.9	29.8	6.1
Other and undefined	7.4	3.7	11.1	2.3
Total, Community services	27.0	45.5	72.5	14.7
Entertainment, recreation, restaurants, hotels and personal services —				
Restaurants, hotels and clubs	5.8	9.7	15.5	3.2
Personal services	1.7	3.5	5.2	1.1
Other and undefined	2.9	2.2	5.1	1.0
Total, Entertainment, recreation, hotels and personal services	10.4	15.4	25.8	5.2
Inadequately described and not stated	16.7	15.2	31.9	6.5
TOTAL, EMPLOYED POPULATION	320.4	172.3	492.7	100.0

(a) Only those sub-divisions in which more than 4,927 persons (1 per cent of the total) were recorded are shown separately. (b) Including 'undefined', i.e. persons who could not be accurately assigned to one of the sub-divisions shown.

**EMPLOYED POPULATION — INDUSTRY: CENSUS, 30 JUNE 1976**  
**CLASSIFICATION ACCORDING TO STATISTICAL DIVISION**  
**(Thousands)**

Statistical division	Primary (in- cluding mining)	Manu- facturing ing	Con- struc- tion	Whole- sale and retail trade	Trans- port, storage, and com- muni- cation	Com- munity services	Enter- tain- ment, restaur- ants, hotels etc. (a)	Other indus- tries (b)	Total (all indus- tries)
<b>MALES</b>									
Perth Statistical Division	6.2	44.5	28.2	42.2	21.2	21.5	7.8	44.9	216.5
Other divisions —									
South-West	5.6	4.5	2.6	2.9	1.8	1.1	0.5	3.1	22.2
Lower Great Southern	4.2	1.2	1.1	1.6	0.9	0.7	0.3	1.3	11.3
Upper Great Southern	4.1	0.2	0.5	0.8	0.6	0.3	0.1	0.7	7.4
Midlands (c)	7.9	0.8	1.1	1.9	1.3	0.8	0.3	1.9	16.0
South-Eastern	4.6	0.8	1.2	1.3	0.9	0.7	0.3	2.1	11.8
Central	5.1	0.8	1.7	1.7	1.4	0.9	0.4	2.6	14.6
Pilbara	7.0	0.4	1.5	0.5	1.0	0.5	0.6	4.2	15.8
Kimberley	1.2	0.3	0.4	0.3	0.3	0.6	0.1	1.0	4.1
Total	39.9	9.2	10.1	11.1	8.7	5.5	2.6	16.8	103.9
Total, all divisions	45.9	53.7	38.3	53.3	29.4	27.0	10.4	61.6	319.5
Migratory (d)	0.2	—	—	—	0.5	—	—	0.1	0.9
Total males employed	46.1	53.7	38.3	53.3	29.9	27.0	10.4	61.7	320.4
<b>FEMALES</b>									
Perth Statistical Division	2.6	11.3	3.0	28.9	4.0	35.7	11.1	28.5	125.1
Other divisions —									
South-West	2.0	0.6	0.2	2.1	0.3	2.4	0.9	2.0	10.5
Lower Great Southern	1.9	0.3	0.1	1.0	0.2	1.0	0.5	1.1	6.1
Upper Great Southern	2.0	0.1	—	0.5	0.1	0.7	0.2	0.5	4.1
Midlands (c)	3.4	0.2	0.1	1.3	0.2	1.4	0.6	1.2	8.3
South-Eastern	0.8	0.1	0.1	0.9	0.2	1.3	0.5	0.9	4.9
Central	1.6	0.2	0.1	1.3	0.3	1.4	0.7	1.5	7.0
Pilbara	0.7	—	0.1	0.5	0.2	0.9	0.7	1.1	4.2
Kimberley	0.2	0.1	—	0.2	0.1	0.7	0.2	0.4	1.9
Total	12.5	1.6	0.8	7.9	1.5	9.8	4.3	8.8	47.2
Total, all divisions	15.1	12.9	3.8	36.8	5.5	45.5	15.3	37.2	172.2
Migratory (d)	—	—	—	—	—	—	—	—	0.1
Total females employed	15.2	12.9	3.8	36.8	5.5	45.5	15.4	37.2	172.3
<b>PERSONS</b>									
Perth Statistical Division	8.8	55.9	31.2	71.2	25.1	57.2	18.9	73.3	341.6
Other divisions —									
South-West	7.6	5.1	2.8	5.0	2.1	3.6	1.4	5.0	32.6
Lower Great Southern	6.1	1.6	1.2	2.7	1.1	1.7	0.7	2.3	17.4
Upper Great Southern	6.1	0.3	0.6	1.3	0.7	1.0	0.3	1.2	11.5
Midlands (c)	11.3	1.0	1.2	3.2	1.6	2.2	0.9	3.1	24.4
South-Eastern	5.3	0.9	1.3	2.2	1.1	2.0	0.9	3.0	16.7
Central	6.7	1.0	1.8	3.0	1.6	2.2	1.1	4.1	21.6
Pilbara	7.7	0.5	1.6	1.0	1.3	1.4	1.3	5.2	20.0
Kimberley	1.4	0.4	0.4	0.5	0.4	1.2	0.3	1.4	6.0
Total	52.4	10.7	10.9	18.9	10.3	15.3	6.9	25.6	151.1
Total, all divisions	61.0	66.6	42.1	90.1	34.9	72.5	25.8	98.8	491.7
Migratory (d)	0.3	—	—	—	0.5	—	—	0.1	1.0
Total persons employed	61.2	66.7	42.1	90.1	35.4	72.5	25.8	98.9	492.7

(a) Includes Sport and recreation and Personal services. (b) Comprises Electricity, gas and water; Finance, insurance, real estate and business services; Public administration and defence; and Inadequately described and not stated. (c) Includes Houtman Abrolhos (unincorporated). (d) Comprises persons (both passengers and crew) who, at midnight on census night, were enumerated on board ships in Western Australian ports, or ships which had left an Australian port before census night for a next port of call in Western Australia. It includes also those who were enumerated on long-distance trains, motor coaches or aircraft.

### Classification according to Occupation

Occupation is defined as the nature of the work which a person performs, and implies *personal* performance. It may be based on the material treated, the process carried out or the type of service rendered by an *individual* worker. Thus the occupation of a person is the kind of work that he or she personally performs, as distinct from industry, which is defined as the *branch of productive activity, business or service carried out by the establishment in which a person is employed* and is not concerned with the nature of personal performance.

The Classification of Occupations used in the tabulation of the 1976 Census data has been adapted from and closely adheres to the principles embodied in the International Standard Classification of Occupations issued by the International Labour Office, Geneva, 1958 and as revised in 1968. The International Standard Classification of Occupations was prepared after extensive discussions and research by world experts in this field to provide an adequate classification framework for countries interested in occupational classification and, at the same time, provide a basis for international comparison of occupational data obtained mainly from Censuses of Population. The Australian Classification of Occupations contains 11 Major Groups, 73 Minor Groups and 395 Occupation Codes. In accordance with the International Standard Classification, occupations have been grouped according to the general similarity of the characteristics of the work which they entail.

### EMPLOYED POPULATION — OCCUPATIONS: CENSUS, 30 JUNE 1976 (Thousands)

Major and minor group	Males	Females	Persons
Professional, technical and related workers —			
Architects, engineers and surveyors, professional	4.4	—	4.4
Chemists, physicists, geologists and other physical scientists	0.9	—	1.0
Biologists, veterinarians, agronomists and related scientists	0.9	0.2	1.1
Medical practitioners and dentists	1.8	0.3	2.0
Nurses, including probationers or trainees	0.5	9.2	9.7
Professional medical workers, n.e.c.	0.9	0.9	1.8
Teachers	7.7	10.4	18.2
Clergy and related members of religious orders	0.8	0.3	1.1
Law professionals	0.6	0.1	0.6
Artists, entertainers, writers and related workers	1.7	1.0	2.7
Draftsmen and technicians, n.e.c.	6.4	1.6	8.1
Other professional, technical and related workers	4.8	2.1	6.9
Total	31.5	26.1	57.6
Administrative, executive and managerial workers —			
Administrative and executive officials, government, n.e.c.	1.4	—	1.5
Employers, workers on own account, directors, managers, n.e.c.	24.8	4.3	29.1
Total	26.3	4.3	30.6
Clerical workers —			
Book-keepers and cashiers	1.9	4.5	6.3
Stenographers and typists	0.1	10.3	10.4
Other clerical workers	23.4	36.8	60.1
Total	25.3	51.5	76.8
Sales workers —			
Insurance, real estate salesmen, auctioneers and valuers	3.2	0.4	3.7
Commercial travellers and manufacturers' agents	3.5	0.3	3.8
Proprietors and shopkeepers, workers on own account, n.e.c., retail and wholesale trade, salesmen, shop assistants and related workers	11.5	19.8	31.3
Total	18.2	20.6	38.8
Farmers, fishermen, hunters, timber getters and related workers —			
Farmers and farm managers	19.9	9.7	29.6
Farm workers, including farm foremen	12.0	3.3	15.3
Wool classers	0.2	—	0.2
Fishermen and related workers	1.7	0.1	1.8
Timber getters and other forestry workers	0.9	—	0.9
Total	34.5	13.1	47.6

**EMPLOYED POPULATION — OCCUPATIONS: CENSUS, 30 JUNE 1976 — *continued***  
(Thousands)

Major and minor group	Males	Females	Persons
Miners, quarrymen and related workers —			
Miners, mineral prospectors and quarrymen	4.6	—	4.6
Well drillers, oil, water and related workers	0.3	—	0.3
Mineral treaters	1.1	—	1.1
Total	6.0	—	6.0
Workers in transport and communication —			
Deck and engineer officers, ship	0.4	—	0.4
Deck and engine room hands, ship and boatmen	0.9	—	0.9
Aircraft pilots, navigators and flight engineers	0.3	—	0.3
Drivers and firemen, rail transport	1.1	—	1.1
Drivers, road transport	14.8	1.2	16.0
Guards and conductors, railway	0.4	—	0.4
Inspectors, supervisors, traffic controllers and dispatchers, transport	1.8	—	1.8
Telephone, telegraph and related telecommunication operators	0.3	2.2	2.5
Postmasters, postmen and messengers	1.7	0.4	2.1
Workers in transport and communications, n.e.c.	1.4	0.1	1.5
Total	23.3	3.9	27.2
Tradesmen, production-process workers and labourers, n.e.c. —			
Spinners, weavers, knitters, dyers and related workers	0.2	0.1	0.3
Tailors, cutters, furriers and related workers	1.1	1.8	2.9
Leather cutters, lasters, sewers (except gloves and garments) and related workers	0.2	0.1	0.4
Furnacemen, rollers, drawers, moulders and related metal making and treating workers	1.2	—	1.2
Precision instrument makers, watchmakers, jewellers and related workers	1.4	0.1	1.5
Toolmakers, metal machinists, mechanics, plumbers and related metal workers	31.4	0.2	31.6
Electricians and related electrical and electronics workers	11.9	0.1	12.0
Metal workers, metal and electrical production-process workers, n.e.c.	4.1	0.4	4.5
Carpenters, woodworking machinists, cabinetmakers and related workers	10.6	0.3	11.0
Painters and decorators	4.3	—	4.3
Bricklayers, plasterers and construction workers, n.e.c.	12.1	0.1	12.2
Compositors, printing machinists, engravers, bookbinders and related workers	2.1	0.5	2.6
Potters, kilnmen, glass and clay formers and related workers	0.8	0.1	0.9
Millers, bakers, butchers, brewers and related food and drink workers	6.6	1.7	8.4
Chemical, sugar and paper production process workers	1.1	0.1	1.2
Paper products, rubber, plastic and production process workers, n.e.c.	1.8	0.7	2.4
Packers, wrappers, labellers	0.5	1.3	1.8
Stationary engine, excavating and lifting equipment operators	7.1	—	7.1
Storemen and freight handlers	9.0	0.4	9.4
Labourers, n.e.c.	15.9	1.0	16.9
Apprentices, factory workers, foremen, machinists, (so described) n.e.c.	1.9	0.5	2.4
Total	125.4	9.7	135.1
Service, sport and recreation workers —			
Fire brigade, police and other protective service workers	4.5	0.1	4.6
Housekeepers, cooks, maids and related workers	2.2	11.9	14.1
Waiters, bartenders	1.0	4.2	5.2
Building caretakers, cleaners	2.9	5.6	8.5
Barbers, hairdressers and beauticians	0.4	1.8	2.2
Launderers, dry cleaners and pressers	0.2	1.1	1.4
Athletes, sportsmen and related workers	0.5	0.2	0.6
Photographers, and camera operators	0.2	—	0.3
Undertakers, and crematorium workers	0.1	—	0.1
Service, sports, recreation workers, n.e.c.	2.2	5.1	7.3
Total	14.3	30.1	44.3
Members of armed services	2.8	0.1	3.0
Occupation inadequately described or not stated	12.9	12.9	25.8
TOTAL, EMPLOYED POPULATION	320.4	172.3	492.7

### The Labour Force Survey

The Australian Statistician prepares estimates of the civilian labour force based on results of the population survey which is carried out on a sample basis throughout Australia each month. Selected private dwellings (houses, flats, etc.) and other dwellings (hotels, motels, etc.) are visited in the course of each survey. Information is obtained by means of personal interviews carried out by specially trained enumerators. The results of the survey are published



by the Australian Statistician in the monthly and annual releases entitled *The Labour Force* (Catalogue Nos. 6203.0 and 6204.0 respectively) and in the annual *Labour Statistics* (Catalogue No. 6101.0). The survey includes all persons aged fifteen years and over who were in one of the following categories: those who worked for one hour or more for payment or profit at any time during the survey week (the week preceding the interviews); those who had a job from which they were temporarily absent; those who were temporarily laid off without pay for the whole of the week; and those who did not work, did not have a job and were actively looking for work.

Persons helping but not receiving wages or salary who usually worked less than fifteen hours per week are excluded from the survey. Bonded trainees (including trainee teachers) and cadets engaged in full-time study at educational institutions are also excluded, even though the institution is conducted by their employer.

The unemployed members of the labour force are those persons who did no work during the survey week and either looked for work (having no job) or were temporarily laid off from a job.

The approach adopted at the 1976 Census in determining the labour force conforms closely to the recommendations of the Eighth International Conference of Labour Statisticians held at Geneva in 1954. Accordingly, any labour force activity of one hour or more during the survey week results in the person being counted in the labour force. Thus many persons whose main activity is not a labour force one (e.g. housewife, full-time student) are drawn into the labour force by virtue of part-time or occasional labour force activity in that week. On the other hand, the definition excludes persons who may frequently or usually participate in the labour force but who, during that week happened to have withdrawn from the labour force.

The following table shows estimates of the employment status of the civilian population of Western Australia since August 1975. The figures relate to all persons aged fifteen years and over except members of the permanent armed forces and certain diplomatic personnel customarily excluded from census and estimated populations.

#### CIVILIAN POPULATION 15 YEARS OF AGE AND OVER — EMPLOYMENT STATUS

Month of August	Employed		Unemployed		Total labour force		Not in labour force ('000)	Civilian population aged 15 and over ('000)
	Number ('000)	Per cent of labour force	Number ('000)	Per cent of labour force	Number ('000)	Per cent of population		
MALES								
1975	338.1	97.4	8.9	2.6	347.1	83.6	68.2	415.2
1976	343.1	96.8	11.3	3.2	354.4	83.3	71.1	425.5
1977	347.3	96.2	13.6	3.8	361.0	82.7	75.7	436.7
1978	335.8	94.2	20.8	5.8	356.6	79.3	93.1	449.7
1979	339.9	94.0	21.8	6.0	361.7	78.9	97.0	458.7
1980	352.9	94.5	20.8	5.6	373.6	79.4	97.0	470.6
FEMALES								
1975	166.0	95.3	8.1	4.6	174.1	43.1	229.7	403.7
1976	175.0	93.9	11.2	6.0	186.3	44.9	228.2	414.5
1977	178.7	93.3	12.8	6.7	191.5	44.9	235.3	426.8
1978	182.5	91.8	16.3	8.2	198.8	45.1	241.8	440.6
1979	186.0	90.6	19.4	9.4	205.4	45.7	244.4	449.8
1980	200.6	92.7	15.7	7.3	216.3	46.9	245.3	461.6
PERSONS								
1975	504.1	96.7	17.0	3.3	521.1	63.6	297.8	818.9
1976	518.1	95.8	22.5	4.2	540.6	64.4	299.3	840.0
1977	526.0	95.2	26.4	4.8	552.5	64.0	311.1	863.5
1978	518.3	93.3	37.1	6.7	555.4	62.4	334.9	890.3
1979	526.0	92.8	41.2	7.3	567.1	62.4	341.4	908.6
1980	553.4	93.8	36.5	6.2	589.9	63.3	342.3	932.2

## ESTIMATES OF EMPLOYMENT

In addition to employment data provided by the census and the labour force survey, there are available monthly estimates of the number of wage and salary earners in civilian employment. The prime purpose of this series is to measure, as nearly as possible with available data, *current monthly trends* in employment in the defined field.

The estimates, except those relating to government employment, are based on comprehensive data referred to as 'benchmarks', derived for the purpose from the results of the 1976 Population Census and other relevant sources. Month-to-month changes shown by current returns are linked to the benchmark data to derive the monthly estimates. The figures used for this purpose are obtained from three main sources: (i) current pay-roll tax returns, which are lodged by all employers paying more than \$72,000 per annum in wages, other than those specifically exempted under the pay-roll tax legislation; (ii) current returns from government bodies; and (iii) some other current returns of employment (e.g. for hospitals). The balance, i.e. unrecorded private employment, is estimated.

The figures relate only to civilian wage and salary earners, not to the total labour force. They therefore exclude employers, self-employed persons, unpaid helpers, members of the defence forces and the unemployed. Employees in agriculture and in private domestic service are not included in the estimates because the available data are inadequate.

As the results of each successive population census become available it is the practice to derive from them new benchmarks for the monthly employment series, and to revise the published estimates for all periods subsequent to the date of the previous census. Revised estimates of civilian employees for each month from June 1966 to June 1979 are available in the publication *Civilian Employees Australia — June 1966 to June 1979* (Catalogue No. 6214.0) published by the Australian Statistician. The figures incorporate revised benchmarks and are based on data obtained from the 1966, 1971 and 1976 population censuses, labour force surveys, economic censuses and surveys, pay-roll tax returns, returns from government bodies and other employment returns. They replace and are not compatible with employment figures published in previous Year Books.

The estimated monthly changes are derived mainly from returns from employers relating to establishments or enterprises, while the benchmark figures were derived from particulars recorded for individuals on population census schedules, which do not in all cases provide sufficiently precise information to allow accurate coding of industry. Industry dissections of the census totals of wage and salary earners were therefore adjusted to make them consistent as far as possible with industry coding at the establishment level.

Current data supplied by reporting enterprises or establishments generally refer to persons on the pay-roll for the last pay-period in each month. Persons who are on paid leave or who work during part of the pay-period and are unemployed or on strike during the rest of the period are generally counted as employed. Those not shown on employer's pay-rolls because they are on leave without pay, on strike or stood down for the entire period are excluded.

### Government Employment

Employees of government and semi-government authorities are included in the figures shown in the table 'Wage and Salary Earners in Civilian Employment — Industry'. Estimates of the numbers employed by Commonwealth Government, State Government, and local government authorities are available separately. They include not only those engaged in administrative activities but also employees on services such as railways, road transport, air transport, shipping, education, health, public hospitals (other than those run by religious or charitable institutions), migrant hostels, banks, postal and telecommunications, broadcasting and television, police, factories, marketing authorities, electricity generation and supply, water conservation, irrigation, road and bridge construction, harbour works and other public works.

**GOVERNMENT AUTHORITIES — CIVILIAN EMPLOYEES IN WESTERN AUSTRALIA**  
(Thousands)

June	Commonwealth Government (a)			State Government (a) (b)			Local Government (b)			Total (a) (b)		
	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons
1975	16.8	6.8	23.6	58.1	34.4	92.5	8.8	1.4	10.2	83.7	42.6	126.3
1976	16.6	6.6	23.3	59.1	36.6	95.7	6.7	1.3	8.0	82.4	44.6	127.0
1977	16.4	6.6	23.0	61.1	39.8	100.9	6.7	1.4	8.2	84.2	47.8	132.0
1978	16.3	6.8	23.1	62.2	41.7	103.9	7.3	1.7	8.9	85.8	50.2	136.0
1979	16.2	6.9	23.1	62.4	43.0	105.4	7.3	1.7	9.0	85.9	51.7	137.5
1980	16.1	7.1	23.3	62.8	44.5	107.3	7.3	1.8	9.1	86.2	53.4	139.6

(a) Includes employees of semi-government authorities.

(b) Excludes a small number of employees engaged in agriculture.

**Employment according to Industry**

The following table shows the number of wage and salary earners in civilian employment in Western Australia in various industry divisions and sub-divisions. The industry classification used is the Australian Standard Industrial Classification, which is described in the publication *Australian Standard Industrial Classification* (Preliminary Edition), 1969, Volume 1 (Catalogue No. 1210.0), issued by the Australian Statistician, Canberra. This industry classification is not directly comparable with those adopted for population censuses before 1971 and used in estimates of civilian employment published in the 1975 Year Book and earlier issues.

**WAGE AND SALARY EARNERS IN CIVILIAN EMPLOYMENT — INDUSTRY**  
(Excluding defence forces and employees in agriculture and private domestic service)  
(Thousands)

ASIC (a)		June		
sub-division	Industry division and sub-division	1977	1978	1979
MALES				
03-04	Forestry, fishing and hunting	1.9	2.0	2.2
11-16	Mining	20.5	18.7	(b) 16.4
21-34	Manufacturing	54.8	54.0	53.3
36-37	Electricity, gas and water	7.2	7.5	7.6
41-42	Construction	31.9	32.0	29.2
46-47	Wholesale trade	22.4	22.2	22.0
48	Retail trade	27.6	27.5	27.2
51-55	Transport and storage	21.4	21.4	21.1
56	Communication	7.8	7.7	7.5
61-63	Finance, insurance, real estate and business services	15.6	15.9	16.1
71-72	Public administration and defence	14.8	15.0	15.2
	Community services —			
81	Health	8.2	8.8	9.2
82	Education, libraries, museums and art galleries	11.6	12.2	12.8
83-84	Other	8.4	8.8	9.4
91-93,99	Entertainment, recreation, restaurants, hotels and personal services	9.1	9.3	9.1
	Total	263.3	263.1	(b) 258.4
FEMALES				
03-04	Forestry, fishing and hunting	0.2	0.2	0.2
11-16	Mining	2.2	2.2	2.3
21-34	Manufacturing	11.8	11.4	11.6
36-37	Electricity, gas and water	0.6	0.6	0.6
41-42	Construction	1.8	1.9	1.8
46-47	Wholesale trade	8.9	8.6	8.5
48	Retail trade	29.8	30.5	31.2
51-55	Transport and storage	3.0	3.1	3.0
56	Communication	2.2	2.2	2.2
61-63	Finance, insurance, real estate and business services	16.0	16.4	16.9
71-72	Public administration and defence	8.7	9.2	9.4
	Community services —			
81	Health	29.9	31.2	31.2
82	Education, libraries, museums and art galleries	18.5	19.4	19.9
83-84	Other	3.6	3.9	4.2
91-93,99	Entertainment, recreation, restaurants, hotels and personal services	15.7	15.8	15.5
	Total	153.1	156.6	158.2

**WAGE AND SALARY EARNERS IN CIVILIAN EMPLOYMENT — INDUSTRY — *continued***  
 (Excluding defence forces and employees in agriculture and private domestic service)  
 (Thousands)

ASIC (a)		June		
sub-division	Industry division and sub-division	1977	1978	1979
PERSONS				
03-04	Forestry, fishing and hunting	2.1	2.2	2.4
11-16	Mining	22.8	20.9	(b) 18.7
21-34	Manufacturing	66.7	65.4	64.9
36-37	Electricity, gas and water	7.8	8.1	8.2
41-42	Construction	33.8	33.9	31.0
46-47	Wholesale trade	31.3	30.8	30.5
48	Retail trade	57.5	58.0	58.4
51-55	Transport and storage	24.4	24.4	24.1
56	Communication	10.0	9.9	9.7
61-63	Finance, insurance, real estate and business services	31.6	32.4	33.1
71-72	Public administration and defence	23.5	24.2	24.6
	Community services —			
81	Health	38.1	40.0	40.3
82	Education, libraries, museums and art galleries	30.1	31.6	32.7
83-84	Other	12.1	12.7	13.6
91-93,99	Entertainment, recreation, restaurants, hotels and personal services	24.8	25.1	24.6
Total		416.5	419.8	(b) 416.6

(a) Australian Standard Industrial Classification (1969).

(b) Affected by industrial disputes.

The figures appearing against the item 'Other' under the heading 'Community services' comprise employees in the industry sub-divisions *Welfare and charitable services and religious institutions* and *Other community services* including police and prisons.

### UNEMPLOYMENT

A full count of unemployed persons in Western Australia is available only from population censuses. For the purpose of the Censuses of 30 June 1971 and 1976, unemployed members of the labour force were those persons who did no work during the week preceding the census enumeration and either looked for work (having no job) or were temporarily laid off from a job. In addition, estimates of the number of unemployed are made monthly from data obtained during the Labour Force Surveys (see section *Labour Force Survey* at the beginning of this Part).

### COMMONWEALTH EMPLOYMENT SERVICE

A comprehensive review of the Commonwealth Employment Service was commissioned by the Commonwealth Government in October 1976. As a result of this review the Government defined the establishment and functions of the Commonwealth Employment Service under the *Commonwealth Employment Service Act 1978*.

The main functions of the Service are to assist people seeking employment to obtain positions best suited to their training, experience, abilities and qualifications, and to assist employers seeking labour to obtain employees best suited to the kinds of work being offered.

Job information centres are provided in the metropolitan area and some country towns. Specialised facilities are provided for young people, persons with physical and mental handicaps, former members of the defence forces, Aborigines, rural workers, and persons with professional and technical qualifications.

Professional counselling provided without charge by a staff of qualified psychologists is available to any person, but it is provided particularly for those persons referred by offices of the Commonwealth Employment Service and those who are disadvantaged or suffering any major handicap with respect to employment. A Career Reference Centre in Perth enables members of the public to obtain information on vocational courses and provides them with the opportunity of investigating at leisure their career choices. The Centre provides information in a more extensive manner than is possible in an employment interview or when a visit is made to a

school. Some Commonwealth Employment Service offices have work information centres providing similar services. Another service is the provision of career materials to secondary educational institutions to assist with their conduct of career planning activities. Materials supplied by the vocational counselling service comprise Career Planning Packs and the Career Resource Guide.

The Commonwealth Employment Service administers the National Employment and Training System which came into operation on 1 October 1974. The system provides subsidised training in the form of full-time, part-time and in-plant courses covering a wide range of occupations and industries. Correspondence courses are also available. Provision is made for the payment to trainees of living allowances, reimbursements of expenditure on fees, books and equipment, and certain other benefits. Employers who provide properly supervised training are eligible for a subsidy from the Commonwealth Government. The Special Youth Employment Training Programme operates as part of the National Employment and Training System and allows for subsidies to employers who employ and provide on-the-job training for up to four months for young people aged 15 to 24 years who have previously experienced significant difficulty in obtaining employment. The scheme was extended on 1 February 1981, to include longer term unemployed and to increase the subsidised training period to eight months. The National Employment and Training System is primarily concerned with directing training towards the requirements of the labour market and with providing assistance for those who, because of a lack of skills, are experiencing employment difficulties.

The Commonwealth Rebate for Apprentice Full Time Training scheme applies to all apprentices taken on after 14 January 1977. It aims to encourage employers to train apprentices by subsidising the cost of releasing apprentices during paid working hours to attend or study a basic trade course of technical education or a formal off-the-job training course. The technical education rebate can apply during any year of apprenticeship but the off-the-job rebate applies only during the first year of apprenticeship.

The Commonwealth Employment Service assists in placing in employment migrant workers sponsored by the Commonwealth Government under migration schemes.

In association with placement activities, regular surveys of the labour market are carried out, and detailed information is supplied to interested Commonwealth Government and State Government departments and instrumentalities and to the public. Employers, employees and other interested persons are advised on labour availability, industrial training and employment opportunities in various occupations, industries and areas and on other matters concerning employment.

In Western Australia at 31 March 1981, the Commonwealth Employment Service operated fourteen offices in Perth and suburbs, and there were offices at Albany, Bunbury, Broome, Carnarvon, Collie, Esperance, Geraldton, Kalgoorlie, Kwinana, Mandurah, Manjimup, Merredin, Northam and Port Hedland. In addition, ten Commonwealth Employment Service agencies were spread between Wyndham in the north and Busselton in the south.

The Commonwealth Employment Service also has a Professional Employment Office in Perth, which deals with the placement of the more highly qualified executive and professional applicants. Experts for overseas service under technical aid programmes are recruited by the Service.

## *Chapter X—continued*

### **Part 3 — Prices**

#### **RETAIL PRICES AND PRICE INDEXES**

Prices of a limited range of commodities are recorded in the Blue Books of Western Australia from the early years of settlement. Retail prices of food and groceries and average rentals of houses for years extending back to 1901 have been collected by the Australian Statistician, but it was not until 1911 that a systematic collection of retail price statistics was begun. These statistics were used to compile the 'A' Series Index, which covered food, groceries and house rents and was first compiled in 1912 with the year 1911 as base = 1,000. Four other indexes covering a wider range of commodities and services were compiled by the Australian Statistician at different times before the current Consumer Price Index was introduced in 1960 (retrospectively to the September quarter of 1948).

Retail price indexes aim to measure the changes which occur in the general level of prices in a selected field. The basic principle of a price index is to select commodities and services representative of the field to be covered, and to combine their prices at regular intervals by the use of 'weights' which represent the relative importance of the several commodities and services in the selected field taken as a whole.

The items and standards priced are revised from time to time to keep them in harmony with changing conditions. Before each quarterly collection the standards of all items are reviewed after extensive inquiries among manufacturers, wholesalers and retailers. Where changes in the items or standards priced become necessary, suitable adjustments are made in compiling price series to ensure that they reflect only changes in prices for representative goods of constant quality and not differences in prices of differing standards.

Information concerning retail price indexes and their development in Australia is given in the *Official Year Book of Australia* (Catalogue No. 1301.0) and the *Labour Report*, No. 58 — 1973 (Ref. No. 6.7) published by the Australian Statistician, Canberra.

**The Consumer Price Index.** The Consumer Price Index measures quarterly changes in the price of a 'basket' of goods and services which account for a high proportion of expenditure by metropolitan wage-and-salary-earner households. The 'basket' covers a wide range of goods and services, arranged in the following groups: Food, Clothing, Housing, Household equipment and operations, Transportation, Tobacco and alcohol, Health and personal care, and Recreation. Each group is in turn divided into sub-groups and expenditure classes (i.e. groupings of like items). There are 105 expenditure classes, each with its own weight or measure of relative importance. In calculating the Index, price changes for the various expenditure classes are combined using those weights. Changes in the weighting pattern have been made at approximately five-yearly intervals to account for changes in spending patterns.

The Consumer Price Index is designed to measure price changes affecting a high proportion of metropolitan wage-and-salary-earner households (i.e. households located in the State capital cities or in Canberra) which derive at least three quarters of their total income from wages and salaries. The population group for the Consumer Price Index does, however, exclude the top 10 per cent (in terms of income) of such households as well as those whose total income is less than the minimum adult wage.

The Index actually comprises nine series of price indexes linked to form a continuous series. The ninth series (i.e. the current series) was introduced as from September quarter 1976, with a weighting pattern based on estimated expenditures in 1974-75 obtained from the first household expenditure survey conducted by the Australian Bureau of Statistics (see text *Household Expenditure* later in this Part). A broad outline of the weighting pattern was published in the December quarter 1976 issue of the publication *Consumer Price Index* (Catalogue No. 6401.0), and a more detailed statement listing groups, sub-groups and expenditure classes is available from the Australian Statistician on request.

Since the Consumer Price Index is designed to measure the impact of changing prices on metropolitan wage-and-salary-earner households, price movements are monitored in the kinds of retail outlets or other establishments where such households would normally purchase goods and services. This involves collecting prices from many sources including supermarkets, department stores, footwear stores, restaurants, garages, dental surgeries and hairdressers. Items such as bus, rail and air fares, electricity and gas charges, telephone charges, and local government rates are collected from the appropriate authorities and information on rents is obtained from property management companies. Approximately 80,000 separate price quotations are collected each quarter.

### CONSUMER PRICE INDEX (a)

Group and selected sub-group	Index number					
	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
PERTH						
Food —	160.9	180.2	205.5	235.6	260.2	290.7
Dairy produce	142.9	167.1	183.0	198.6	211.8	228.3
Cereal products	178.9	211.5	238.4	258.7	276.0	297.7
Meat and seafoods (b)	156.9	166.2	192.2	226.6	272.0	335.9
Fruit and vegetables (c)	n.a.	n.a.	108.0	130.0	140.9	142.2
Soft drinks, ice cream and confectionery	192.9	221.0	244.4	272.6	299.9	334.1
Meals out, take-away food (c)	n.a.	n.a.	106.1	120.8	133.2	149.0
Other food	142.8	159.5	183.1	215.2	217.0	229.0
Clothing	174.2	202.3	232.9	258.6	277.0	295.9
Housing	174.2	209.7	244.5	269.4	282.3	292.8
Household equipment and operation	154.5	184.1	198.9	217.8	233.4	251.6
Transportation	158.2	184.9	206.2	224.8	249.4	278.7
Tobacco and alcohol	167.6	206.4	226.3	237.6	277.2	299.7
Health and personal care (d)	188.2	156.6	308.1	365.6	337.0	385.5
Recreation (c)	n.a.	n.a.	104.3	113.5	120.8	131.2
All groups	166.1	189.6	219.4	243.1	262.8	287.4

### SIX STATE CAPITAL CITIES COMBINED (e)

Food —	164.0	180.2	201.2	223.2	248.8	283.5
Dairy produce	150.4	167.8	180.0	199.7	214.5	230.6
Cereal products	183.4	212.1	231.8	252.1	268.7	291.5
Meat and seafoods (b)	159.0	167.7	188.4	207.1	258.1	332.5
Fruit and vegetables (c)	n.a.	n.a.	105.8	115.4	128.1	130.5
Soft drinks, ice cream and confectionery	189.4	217.5	240.7	270.4	293.5	327.9
Meals out, take-away food (c)	n.a.	n.a.	104.2	115.3	125.3	140.9
Other food	140.2	155.1	178.1	209.5	210.6	228.6
Clothing	173.0	201.0	232.5	257.4	276.3	295.1
Housing	187.4	221.1	251.8	274.6	292.5	314.3
Household equipment and operation	153.8	178.3	196.3	212.6	225.9	244.2
Transportation	173.0	203.8	221.9	240.1	262.7	296.5
Tobacco and alcohol	170.4	211.1	229.8	240.0	277.4	300.5
Health and personal care (d)	186.5	151.6	265.8	318.3	301.7	329.6
Recreation (c)	n.a.	n.a.	104.1	113.4	120.7	131.1
All groups	171.1	193.3	220.0	241.0	260.7	287.2

(a) Unless otherwise indicated, base of each Index is Year 1966-67 = 100. (b) Excludes 'seafoods' prior to October 1976. (c) Base: September quarter 1976 = 100. (d) Base: December quarter 1968 = 100. (e) Weighted average.

Food items are priced at the middle of each month except in the case of some fresh items (fruit, vegetables and fish) where prices are collected more frequently and averaged to obtain monthly prices. Most of the other items are priced quarterly, usually at the middle of the mid-

month of the quarter (February, May, August and November). Some items are collected during the first month of each quarter and some items, such as local authority rates, need to be priced only once a year.

The Consumer Price Index is compiled for each of the six State capital cities and for Canberra. The separate city indexes measure price movements within each city individually. They enable comparisons to be drawn between cities as to differences in the degree of price movement, but not as to differences in the price level.

In tables dealing with the Consumer Price Index, the figures appearing after the decimal point have little significance for general statistical purposes. They are inserted to avoid distortions that would occur in rounding off the figures to the nearest whole number.

Details of movements in the Consumer Price Index are published quarterly by the Australian Statistician, Canberra for the groups individually and for all groups combined. In addition, index numbers for the Food Group and its component sub-groups are issued monthly in the publication *Consumer Price Index — Monthly Food Group Index Numbers* (Catalogue No. 6402.0). A detailed description of the Consumer Price Index appears in the *Labour Report*, No. 58 — 1973 (Ref. No. 6.7).

**Retail Prices.** The average retail prices of selected items of food and groceries in Perth are shown in the following table. The quantity units shown are those that were applicable in December quarter 1980. The prices shown are in some cases averages for periods of less than one year.

AVERAGE RETAIL PRICES OF SELECTED ITEMS — PERTH  
(Cents)

Commodity	Unit	1978	1979	1980
Food —				
Milk, bottled, delivered	2 x 600 ml	49.8	53.5	58.0
Cheese, processed	250 g	53.8	55.8	62.0
Butter	500 g	88.2	91.2	101.8
Bread, milk loaf, sliced	680 g	53.5	58.5	65.2
Biscuits, dry	250 g	n.a.	n.a.	51.0
Breakfast cereal, corn based	500 g	82.0	86.2	93.5
Flour, self-raising	1 kg	46.2	50.0	52.8
Rice	500 g	37.8	37.8	34.2
Beef — Rib (without bone)	1 kg	198.2	345.8	382.8
Rump steak	1 kg	402.8	562.2	617.8
T-bone, with fillet	1 kg	322.8	490.8	547.8
Chuck steak	1 kg	210.0	346.8	378.0
Silverside, corned	1 kg	253.8	378.2	420.5
Sausages	1 kg	142.8	184.5	201.8
Lamb — Leg	1 kg	310.0	343.8	388.0
Loin chops	1 kg	316.5	355.8	400.0
Forequarter chops	1 kg	279.0	323.8	367.5
Pork — Leg	1 kg	344.5	371.2	379.8
Loin chops	1 kg	322.8	362.2	381.5
Chicken, frozen	1 kg	178.5	193.0	199.2
Bacon, middle rashers	250 g pkt	117.2	137.2	141.5
Beef, corned	340 g can	98.5	117.2	158.0
Salmon, pink	220 g can	100.0	107.5	120.5
Oranges	1 kg	63.0	69.5	68.2
Bananas	1 kg	98.8	108.5	106.0
Potatoes	1 kg	41.5	46.0	48.2
Tomatoes	1 kg	146.2	108.2	186.5
Carrots	1 kg	58.8	45.5	53.2
Onions	1 kg	47.0	55.8	53.0
Peaches	825 g can	64.8	70.8	73.8
Pineapple pieces	450 g can	47.2	47.5	51.2
Peas, frozen	500 g pkt	59.2	60.5	61.5
Chocolate, milk, block	200 g	78.5	85.8	99.0
Eggs, 55 g	1 dozen	114.8	118.5	127.0
Sugar, white	2 kg	66.0	80.2	88.8
Jam, strawberry	500 g jar	89.0	96.5	99.5
Tea	250 g	84.0	75.2	73.8
Coffee, instant	150 g jar	295.8	257.5	283.5



AVERAGE RETAIL PRICES OF SELECTED ITEMS — PERTH — *continued*  
(Cents)

Commodity	Unit	1978	1979	1980
<i>Food — continued</i>				
Tomato sauce	300 ml	42.0	44.5	45.5
Margarine, table, poly-unsaturated	500 g	80.8	82.2	91.2
Baked beans (in tomato sauce)	440 g	n.a.	n.a.	40.8
Baby food	125 g can	20.2	21.8	22.8
<i>Household supplies —</i>				
Laundry detergent	1 kg	n.a.	n.a.	178.8
Dishwashing detergent	750 ml	101.0	111.5	128.5
Facial tissues	pkt of 150	64.8	69.8	77.0
Toilet paper	2 x 550 sheet rolls	n.a.	n.a.	74.2
Pet food	405 g	33.5	36.2	40.8
<i>Motor vehicle operation —</i>				
Petrol, super grade	1 litre	n.a.	n.a.	31.8
<i>Alcoholic beverages —</i>				
Beer — Chilled	740 ml bottle	77.5	90.8	94.8
Unchilled	12 x 740 ml bottles	n.a.	n.a.	982.0
Draught beer, public bar	285 ml glass	n.a.	n.a.	60.8
Scotch, nip, public bar	30 ml	80.2	98.8	108.5
<i>Personal care products —</i>				
Toilet soap	2 x 125 g	56.5	63.8	74.2
Toothpaste	110 g	60.2	67.2	78.2

If a detailed analysis of price movements is to be undertaken reference should be made to the appropriate copies of the publication *Average Retail Prices of Selected Items* (Catalogue No. 6403.0).

**Household Expenditure.** During the financial years 1974-75 and 1975-76, the Australian Bureau of Statistics conducted two surveys in order to obtain information about the expenditure patterns of private households. The 1974-75 survey was confined to a sample of households in the six State capital cities and Canberra (collection in Darwin being suspended in December 1974 due to cyclone 'Tracy') while the coverage of the 1975-76 survey was extended to include other urban, and rural regions. Perhaps the most important reason for the collection of data relating to expenditure at the household level is to provide information for use in improving the representativeness of the items and the weighting pattern used to compile the Consumer Price Index. Household expenditure statistics also provide data needed for a wide range of policy and research purposes. These include the planning of welfare services; assessing the need for, and effect of, programmes in fields such as housing, education and health; assessing the impact of taxation and government benefits; and improving estimates of private final consumption expenditure in the National Accounts.

The 1974-75 survey obtained data from a sample of 9,095 households in the six State capital cities and Canberra, while the 1975-76 survey sampled 5,896 households in the whole of Australia (except remote and sparsely settled areas). Apart from this difference in geographic coverage, the subject content and general methodology of the two surveys were virtually identical. Detailed results of the two surveys have been published in a series of bulletins issued by the Australian Statistician, Canberra.

Tables showing particulars of household expenditure by States, Territories and Regions can be found in the three previous issues of the Year Book.

#### WHOLESALE PRICE INDEXES OF MATERIALS USED IN BUILDING

Two building material indexes are compiled and published by the Australian Statistician. They are the Price Index of Materials used in House Building and the Price Index of Materials used in Building other than House Building. Figures for both indexes are available from July 1966 on a monthly basis and for each financial year from 1966-67, and they were first published in November 1970 and April 1969 respectively. Index numbers are produced for each State capital city and for the six State capital cities combined. The reference base for the indexes is the

year 1966-67 = 100. They are fixed-weights indexes calculated by the method known as 'the weighted arithmetic mean of price relatives'.

Prices used in the indexes relate to specified standards, and are obtained in all State capital cities from representative suppliers of materials used in building. In the main they are collected as at the mid-point of the month to which the index refers.

The separate city indexes measure price movements in each State capital city individually. They enable comparisons to be drawn between capitals as to the difference in the degree of price movement from period to period but not as to differences in price level. Figures are published to one decimal place to avoid distortions that would occur in rounding off the index numbers to the nearest whole number.

Information additional to that shown in the following sections, as well as detailed group index numbers for each State capital city, is given in the *Labour Report*, No. 58 — 1973 (Ref. No. 6.7), and the monthly publications *Price Index of Materials used in House Building* (Catalogue No. 6408.0) and *Price Index of Materials used in Building other than House Building* (Catalogue No. 6407.0) issued by the Australian Statistician, Canberra.

**WHOLESALE PRICE INDEX OF MATERIALS USED IN HOUSE BUILDING**  
(Base of each Index: Year 1966-67 = 100.0)

Group	Value weight (per cent)	Index number					
		1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
PERTH							
Concrete mix, cement and sand	7.94	148.7	174.8	197.6	219.8	229.5	250.9
Cement products	8.14	178.8	214.6	248.3	280.8	296.1	324.1
Clay bricks, tiles, etc.	16.44	190.7	223.4	251.8	274.9	289.8	324.8
Timber, board and joinery	29.60	179.2	212.9	240.9	269.0	284.4	311.9
Steel products	6.07	193.8	232.6	263.1	286.1	303.0	334.9
Other metal products	7.69	165.6	179.9	197.5	205.4	224.6	273.9
Plumbing fixtures, etc.	4.59	159.0	181.5	224.5	251.4	262.8	301.7
Electrical installation materials	1.76	172.8	187.1	204.0	213.8	236.9	277.2
Installed appliances	4.12	140.5	159.5	172.4	176.7	184.6	198.8
Plaster and plaster products	4.01	128.3	147.7	170.5	185.8	194.1	210.0
Miscellaneous materials	9.64	164.3	194.0	230.8	259.8	277.9	318.4
All groups	100.00	172.4	201.9	229.8	253.4	268.2	299.4
SIX STATE CAPITAL CITIES COMBINED (a)							
Concrete mix, cement and sand	5.73	165.7	195.1	217.8	239.0	255.5	292.8
Cement products	8.10	193.1	227.0	258.9	284.6	303.8	336.3
Clay bricks, tiles, etc.	12.85	180.3	205.1	227.8	245.8	262.2	294.8
Timber, board and joinery	36.16	203.5	226.2	254.1	275.0	290.8	331.5
Steel products	5.86	192.1	229.3	263.2	287.7	307.6	341.0
Other metal products	7.20	170.3	187.1	207.9	220.1	239.7	281.7
Plumbing fixtures, etc.	3.74	174.5	201.5	224.3	239.1	244.1	278.1
Electrical installation materials	1.63	168.3	183.5	201.8	215.5	240.0	282.1
Installed appliances	5.13	146.4	165.9	181.9	193.3	202.9	217.6
Plaster and plaster products	5.64	147.8	167.7	178.8	191.8	204.3	222.8
Miscellaneous materials	7.96	161.5	187.9	210.7	230.4	248.2	278.2
All groups	100.00	183.4	208.1	232.9	252.0	268.1	302.9

(a) Weighted average.

**House Building.** The Wholesale Price Index of Materials used in House Building measures changes in prices of selected materials used in the construction of houses. Its composition is in accordance with the usage of materials in actual houses which were selected as representative for the purpose. The index does not purport to represent buildings of any kind other than houses. The house building construction types included are those which use brick, brick veneer, timber, or asbestos-cement sheeting as the principal material for the outer walls. In all cases the selection of materials was based on local usage. The index includes some fifty items which are combined in eleven groups in addition to the 'All groups' index. Some items carry the weight of similar items not directly priced. They are described in terms of fixed specifications with the aim of recording price changes for representative materials of constant

quality. The items and weights were derived from reported values of each material used in selected representative houses constructed in or about the year 1968-69 in each State capital city. The selection took account, within the four major construction types, of a range of characteristics of these houses, e.g. internal partitions, windows, roofing, etc., as well as whether such things as paths and fences were included in the job.

**Building other than House Building.** The Wholesale Price Index of Materials used in Building other than House Building measures changes in prices of selected materials used in the construction of buildings other than houses and 'low-rise' flats (in general, those up to three storeys). Its composition is in accordance with the materials usage in actual building projects which were selected as representative for the purpose. The building 'use-types' (e.g. office building, factory, etc.) directly represented are 'high-rise' flats (in general, those of more than three storeys); offices; factories; health buildings (i.e. hospitals, nurses' quarters, clinics, etc.); education buildings (i.e. schools, universities, kindergartens, etc.); and commercial premises including hotels, hostels, etc., shops, and other business premises. The index includes seventy-two items, which are combined in eleven groups as shown in the next table.

Although the selected materials (or many of them) are also used in house (and low-rise flat) building, in building repair, maintenance and alteration work, and in 'engineering construction' work (e.g. projects such as roads, dams, bridges and the like), the weighting pattern of the index, being designed for the specific purpose mentioned earlier, is not applicable to these other activities of the construction industry. In addition, since the weights are based on an average materials usage over the stated range of building use-types, the index is not necessarily applicable to any specific building or any of the separate use-types.

**WHOLESALE PRICE INDEX OF MATERIALS USED IN BUILDING  
OTHER THAN HOUSE BUILDING**  
(Base of each Index: Year 1966-67 = 100.0)

Group	Value weight (per cent)	Index number					
		1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
PERTH							
Concrete mix, cement and sand	10.41	143.0	169.1	194.0	216.1	227.8	249.0
Cement products	3.64	171.3	212.2	240.7	258.3	270.3	302.5
Bricks, stone, etc.	5.28	185.1	216.3	241.5	264.2	280.2	311.9
Timber, board and joinery	11.90	186.9	219.2	249.5	274.0	288.9	313.7
Steel and iron products	30.58	198.5	243.5	274.6	302.5	324.6	358.7
Aluminium products	6.01	156.0	186.8	209.0	230.5	241.2	287.9
Other metal products	2.59	151.4	158.4	178.1	180.7	204.2	258.3
Plumbing fixtures	1.19	158.6	176.8	197.4	215.0	224.7	260.0
Miscellaneous materials	7.09	156.5	179.5	206.8	228.2	244.2	276.6
Electrical installation materials (a)	8.61	157.4	177.4	199.6	215.3	242.6	285.4
Mechanical services components (b)	12.70	181.5	201.7	226.0	247.9	269.0	298.7
Special purpose index (c)	78.69	178.0	212.7	240.9	264.6	281.8	314.1
All groups	100.00	176.7	208.3	235.4	258.3	276.8	309.7
SIX STATE CAPITAL CITIES COMBINED (d)							
Concrete mix, cement and sand	10.41	164.6	193.0	215.6	235.3	254.8	294.1
Cement products	3.64	183.9	220.0	244.7	268.4	285.2	319.0
Bricks, stone, etc.	5.28	179.4	202.7	224.0	241.0	256.6	289.0
Timber, board and joinery	11.90	194.7	219.3	243.6	263.2	278.8	313.2
Steel and iron products	30.58	189.2	223.4	251.7	273.4	291.9	325.1
Aluminium products	6.01	169.2	193.6	213.7	230.8	244.6	280.5
Other metal products	2.59	162.7	173.3	195.0	198.1	228.4	285.3
Plumbing fixtures	1.19	197.7	232.1	251.2	263.7	260.2	299.6
Miscellaneous materials	7.09	163.4	186.8	204.2	221.9	234.2	262.4
Electrical installation materials (a)	8.61	157.4	177.4	199.6	215.3	242.6	285.4
Mechanical services components (b)	12.70	181.3	201.3	225.4	247.2	268.2	298.2
Special purpose index (c)	78.69	181.3	210.1	234.5	253.9	270.9	305.7
All groups	100.00	179.2	206.2	230.3	249.7	268.1	303.0

(a) Based on Sydney and Melbourne prices. (b) Based mainly on Sydney and Melbourne prices. (c) All groups, excluding Electrical installation materials and Mechanical services components. (d) Weighted average.

The items and weights were derived from reported values of each material used in selected representative buildings constructed in or about the year 1966-67. The selection took account of building use-type and construction characteristics (e.g. type of frame, wall, floor, etc.) within use-types.

A single weighting pattern, relating to the whole of Australia, is applied (with minor exceptions) to local price measures in calculating indexes for each State capital city. The index for the six State capital cities combined is a weighted average of individual city indexes. The relative weighting of the capitals is in proportion to the estimated value on completion of building other than house building in the separate States during the three years ended June 1967.

In 1981, a review of the Price Index of Materials used in Building other than House Building was completed. The revised index was compiled for each month from July 1979, and first published in *Price Index of Materials used in Building other than House Building* (Catalogue No. 6407.0) in March 1981. It reflects the composition of materials used in the construction of buildings other than houses in 1976-77. The reference base has changed from 1966-67 = 100 to 1979-80 = 100.

Changes have also been made to the categories of materials for which index numbers are published. For Perth, the major changes are as follows:

- (a) the indexes for most of the broad commodity groups contained in the table above have been discontinued;
- (b) indexes for selected major individual materials (e.g. ready mixed concrete) have been introduced;
- (c) a new 'Plumbing materials' index has been introduced.

These changes were made to increase the usefulness of the index to existing users, and to extend the range of published indexes to meet the needs of a wider range of users.

#### OTHER PRICE INDEXES

In addition to the price indexes already described, the Australian Statistician compiles indexes relating to prices of selected export commodities, metallic materials, materials used in manufacturing industry and articles produced by manufacturing industry. Data are published in monthly releases *Export Price Index* (Catalogue No. 6405.0), *Price Index of Metallic Materials* (Catalogue No. 6410.0), *Price Index of Materials used in Manufacturing Industry* (Catalogue No. 6411.0) and *Price Indexes of Articles Produced by Manufacturing Industry* (Catalogue No. 6412.0). Further reference to these indexes will be found in the *Official Year Book of Australia* (Catalogue No. 1301.0) and the *Labour Report* No. 58 — 1973 (Ref. No. 6.7), published by the Australian Statistician, Canberra.

## STATISTICAL SUMMARY

The following pages contain an historical summary of some of the more important statistics relating to Western Australia.

The first year shown on each page is the earliest for which any series on that page is available.

Figures shown in these tables are the latest available at the time of publication; in some cases they may not be strictly comparable with those shown in earlier years.

## ESTIMATED POPULATION, NATURAL INCREASE AND MIGRATION (a)

NOTE. A line drawn across a column indicates a break in continuity in the series. Figures above the line exclude full-blood Aborigines; those below the line refer to total population, i.e. including Aborigines.

Year	Population at 31 December			Population increase (b)			Mean population		Population of Perth Statistical Division (g)	
	Males	Females	Persons	Recorded natural increase (c)	Estimated net migration (d)	Total increase (e)		Year ended —		
						Number	Per cent (f)	30 June		31 December
										(000)
1829	769	234	1,003	n.a.	n.a.	n.a.	n.a.			
1830	877	295	1,172	n.a.	n.a.	169	16.85		n.a.	
1840	1,434	877	2,311	34	123	157	7.29			
1850	3,576	2,310	5,886	132	1,109	1,241	26.72			n.a.
1860	9,597	5,749	15,346	379	130	509	3.43	n.a.		
1870	15,511	9,624	25,135	475	7	482	1.96			
1880	16,985	12,576	29,561	551	129	422	1.45			
1890	28,854	19,648	48,502	1,021	1,821	2,842	6.22			
1900	110,088	69,879	179,967	3,214	6,495	9,709	5.70			
1910	157,971	118,861	276,832	4,845	6,312	11,157	4.20	266,686	271,019	115.7
1920	176,895	154,428	331,323	4,761	1,298	3,463	1.06	327,152	330,023	167.0
1930	232,868	198,742	431,610	5,426	453	4,973	1.17	425,785	429,079	235.1
1931	232,397	201,289	433,686	4,868	2,792	2,076	0.48	431,022	432,347	239.9
1932	233,049	203,271	436,320	4,250	1,616	2,634	0.61	433,596	435,041	238.9
1933	234,744	205,898	440,642	4,084	238	4,322	0.99	436,798	438,780	232.1
1934	236,140	207,589	443,729	3,725	638	3,087	0.70	440,736	442,354	234.3
1935	238,739	210,884	449,623	4,001	1,893	5,894	1.33	444,275	446,874	237.7
1936	240,827	213,373	454,200	4,249	328	4,577	1.02	449,728	452,294	241.0
1937	244,050	216,492	460,542	4,544	1,798	6,342	1.40	454,532	457,328	244.4
1938	246,943	219,741	466,684	4,907	1,235	6,142	1.33	460,642	463,808	247.7
1939	249,065	223,315	472,380	4,696	1,000	5,696	1.22	466,896	469,780	252.2
1940	248,734	225,342	474,076	4,598	2,902	1,696	0.36	472,060	473,397	255.5
1941	246,842	226,371	473,213	4,906	5,769	863	0.18	474,180	473,988	260.0
1942	246,816	229,839	476,655	3,791	349	3,442	0.73	474,833	476,619	265.6
1943	246,389	231,875	478,264	5,137	3,528	1,609	0.34	476,989	476,745	272.3
1944	249,301	235,474	484,775	5,857	654	6,511	1.36	478,271	481,498	281.2
1945	251,590	238,498	490,088	5,418	105	5,313	1.10	484,720	487,510	289.0
1946	255,310	241,663	496,973	7,277	392	6,885	1.40	489,982	492,771	297.9
1947	261,653	247,109	508,762	8,119	3,670	11,789	2.37	497,006	502,951	307.3
1948	268,304	253,695	521,999	8,246	4,991	13,237	2.60	508,747	514,621	315.8
1949	280,273	263,911	544,184	8,721	13,464	22,185	4.25	521,932	532,603	331.4
1950	294,758	277,891	572,649	9,170	19,295	28,465	5.23	545,134	557,878	351.7
1951	304,454	285,885	590,339	9,506	8,184	17,690	3.09	570,346	580,317	362.8
1952	316,700	296,235	612,935	10,204	12,392	22,596	3.83	589,887	600,615	378.1
1953	326,372	305,371	631,743	10,790	8,018	18,808	3.07	611,191	621,034	390.1
1954	334,342	314,365	648,707	10,564	6,400	16,964	2.69	630,705	639,963	402.2
1955	343,838	324,771	668,609	11,244	8,658	19,902	3.07	648,222	657,323	416.8
1956	350,333	330,935	681,268	11,344	1,315	12,659	1.89	666,898	674,459	427.4
1957	356,195	339,039	695,234	11,627	2,339	13,966	2.05	680,949	687,448	438.9
1958	361,441	345,755	707,196	11,177	785	11,962	1.72	693,568	699,915	449.3
1959	366,253	352,438	718,691	11,614	119	11,495	1.63	705,869	711,737	459.5
1960	372,665	358,368	731,033	11,229	1,113	12,342	1.72	717,316	722,900	470.3
1961	384,773	370,440	755,213	11,349	2,571	13,920	1.90	729,770	737,596	482.7
1962	395,891	381,357	777,248	11,254	10,499	22,035	2.92	755,770	766,205	500.3
1963	407,024	391,871	798,895	11,314	10,068	21,647	2.79	777,413	788,457	517.8
1964	417,023	401,098	818,121	10,256	8,705	19,226	2.41	798,824	808,300	534.0
1965	427,330	410,918	838,248	9,912	9,963	20,127	2.46	817,157	826,481	550.9
1966	440,913	423,180	864,093	10,292	15,553	25,845	3.08	837,290	849,189	571.8
1967	458,438	438,550	896,988	11,244	21,651	32,895	3.81	863,539	879,815	597.7
1968	479,938	457,862	937,800	12,073	28,739	40,812	4.55	896,761	915,757	629.2
1969	500,378	476,242	976,620	13,404	25,416	38,820	4.14	935,985	955,660	659.7
1970	520,174	493,878	1,014,052	14,075	23,357	37,432	3.83	975,063	994,201	689.6
1971	542,344	517,389	1,059,733	16,433	16,352	33,033	3.26	1,013,455	1,042,308	725.1
1972	552,368	528,504	1,080,872	14,736	5,907	21,139	1.99	1,058,175	1,070,661	743.6
1973	563,645	539,588	1,103,233	12,665	9,200	22,361	2.07	1,080,368	1,090,632	763.0
1974	580,981	556,868	1,137,849	12,429	21,691	34,616	3.14	1,103,377	1,117,742	791.2
1975	591,123	567,908	1,159,031	12,366	8,320	21,182	1.86	1,133,077	1,146,858	810.3
1976	603,185	580,508	1,183,693	12,930	11,463	24,662	2.13	1,158,176	1,170,312	832.1
1977	616,718	594,380	1,211,098	12,752	14,653	27,405	2.32	1,183,294	1,197,043	855.9
1978 r	626,889	604,783	1,231,682	12,817	7,767	20,584	1.70	1,210,459	1,222,134	873.9
1979 r	637,143	616,455	1,253,598	12,449	9,467	21,916	1.78	1,232,127	1,242,660	894.3
1980 p	647,826	628,850	1,276,676	12,441	10,635	23,076	1.84	1,253,653	1,264,691	910.3

(a) Estimates for years prior to 1976 are based on final census results; those for 1976 and later are subject to revision. (b) Minus sign (—) denotes decrease. (c) Excess of births registered over deaths registered, including deaths of defence personnel, whether in Australia or overseas, between September 1939 and June 1947. (d) Interstate and overseas. (e) For years 1971 to 1975 includes an adjustment to balance net migration and recorded births and deaths with the June 1976 estimates of population aged 0-4 years. (f) The rates represent total increase in population during the year expressed as a proportion per cent of the population at the end of the previous year. (g) At 31 December.

## VITAL STATISTICS

See NOTE at head of previous table.

Year	Marriages registered	Live births registered	Deaths registered (a)	Natural increase (b)	Rate per 1,000 of mean population (c)				Infant mortality	
					Marriages	Births	Deaths (a)	Natural increase (b)	Number (d)	Rate (e)
1840	25	54	20	34	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1850	37	186	54	132	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1860	151	588	209	379	10.01	38.96	13.85	25.11	n.a.	n.a.
1870	153	853	378	475	6.15	34.27	15.18	19.08	100	117.23
1880	214	933	382	551	7.29	31.79	13.02	18.77	72	77.17
1890	278	1,561	540	1,021	5.90	33.16	11.47	21.69	140	89.69
1900	1,781	5,454	2,240	3,214	10.17	31.15	12.79	18.35	688	126.15
1910	2,107	7,585	2,740	4,845	7.77	27.99	10.11	17.88	593	78.18
1920	2,932	8,149	3,388	4,761	8.88	24.69	10.27	14.42	538	66.02
1921	2,656	7,807	3,480	4,327	7.95	23.37	10.42	12.95	611	78.26
1922	2,446	8,131	3,167	4,964	7.17	23.82	9.28	14.54	452	55.59
1923	2,376	7,854	2,930	4,924	6.77	22.39	8.35	14.04	442	56.28
1924	2,596	8,301	3,263	5,038	7.15	22.86	8.99	13.87	414	49.87
1925	2,746	8,185	3,315	4,870	7.36	21.95	8.89	13.06	463	56.57
1926	2,844	8,301	3,350	4,951	7.47	21.79	8.79	13.00	409	49.27
1927	3,108	8,482	3,393	5,089	7.93	21.63	8.65	12.98	389	45.86
1928	3,309	8,704	3,640	5,064	8.12	21.36	8.93	12.43	419	48.14
1929	3,367	9,051	3,930	5,121	8.00	21.51	9.34	12.17	508	56.13
1930	3,205	9,200	3,774	5,426	7.47	21.44	8.80	12.64	430	46.74
1931	2,741	8,549	3,681	4,868	6.34	19.77	8.51	11.26	355	41.53
1932	2,904	7,965	3,715	4,250	6.68	18.31	8.54	9.77	355	44.57
1933	3,374	7,874	3,790	4,084	7.69	17.95	8.64	9.31	290	36.83
1934	3,682	7,801	4,076	3,725	8.32	17.64	9.21	8.42	319	40.89
1935	3,940	8,119	4,118	4,001	8.82	18.17	9.22	8.95	326	40.15
1936	4,242	8,479	4,230	4,249	9.38	18.75	9.35	9.39	358	42.22
1937	4,169	8,609	4,065	4,544	9.12	18.82	8.89	9.94	323	37.52
1938	4,153	9,141	4,234	4,907	8.95	19.71	9.13	10.58	309	33.80
1939	4,195	9,036	4,336	4,700	8.93	19.23	9.23	10.00	369	40.84
1940	5,234	9,121	4,486	4,635	11.06	19.27	9.48	9.79	403	44.18
1941	5,077	10,118	4,769	5,349	10.71	21.35	10.06	11.29	357	35.28
1942	5,441	9,901	5,076	4,825	11.42	20.77	10.65	10.12	365	36.86
1943	4,528	10,481	4,587	5,894	9.50	21.98	9.62	12.36	342	32.63
1944	4,506	10,870	4,478	6,392	9.36	22.58	9.30	13.28	354	32.57
1945	3,788	10,672	4,712	5,960	7.77	21.89	9.67	12.23	315	29.52
1946	5,171	12,105	4,753	7,352	10.49	24.57	9.65	14.92	376	31.06
1947	5,282	12,874	4,723	8,151	10.50	25.60	9.39	16.21	398	30.92
1948	5,186	12,931	4,685	8,246	10.08	25.13	9.10	16.02	331	25.60
1949	4,951	13,511	4,790	8,721	9.30	25.37	8.99	16.37	357	26.42
1950	5,434	14,228	5,058	9,170	9.74	25.50	9.07	16.44	386	27.13
1951	5,390	14,794	5,288	9,506	9.29	25.49	9.11	16.38	425	28.73
1952	5,389	15,413	5,209	10,204	8.97	25.66	8.67	16.99	384	24.98
1953	5,032	15,862	5,072	10,790	8.10	25.54	8.17	17.37	378	23.83
1954	5,204	15,928	5,364	10,564	8.13	24.89	8.38	16.51	359	22.54
1955	5,145	16,623	5,379	11,244	7.83	25.29	8.18	17.11	373	22.44
1956	5,080	16,916	5,572	11,344	7.53	25.08	8.26	16.82	384	22.70
1957	4,897	16,924	5,297	11,627	7.12	24.62	7.71	16.91	357	21.09
1958	5,038	16,731	5,554	11,177	7.20	23.90	7.94	15.97	360	21.52
1959	5,387	17,111	5,497	11,614	7.57	24.04	7.72	16.32	345	20.16
1960	5,323	16,926	5,697	11,229	7.36	23.41	7.88	15.53	366	21.62
1961	5,150	17,078	5,729	11,349	6.98	23.15	7.77	15.39	336	19.67
1962	5,466	17,064	5,810	11,254	7.23	22.58	7.69	14.89	380	22.27
1963	5,755	17,290	5,976	11,314	7.40	22.23	7.68	14.55	353	20.42
1964	6,023	16,685	6,429	10,256	7.55	20.93	8.06	12.86	328	19.66
1965	6,448	16,186	6,274	9,912	7.91	19.85	7.70	12.16	351	21.68
1966	7,002	17,194	6,902	10,292	8.25	20.25	8.13	12.12	343	19.95
1967	7,430	18,023	6,779	11,244	8.44	20.48	7.71	12.78	314	17.42
1968	8,086	19,541	7,468	12,073	8.83	21.34	8.16	13.18	398	20.37
1969	8,993	20,754	7,350	13,404	9.41	21.72	7.69	14.03	453	21.83
1970	9,227	21,618	7,543	14,075	9.28	21.74	7.59	14.16	459	21.23
1971	9,382	24,239	7,806	16,433	9.00	23.26	7.49	15.77	464	19.14
1972	9,120	22,177	7,441	14,736	8.52	20.71	6.95	13.76	348	15.69
1973	9,102	20,510	7,845	12,665	8.35	18.81	7.19	11.61	394	19.21
1974	9,295	20,207	7,778	12,429	8.32	18.08	6.96	11.12	327	16.18
1975	9,026	20,338	7,972	12,366	7.87	17.73	6.95	10.78	271	13.32
1976	9,517	20,670	7,740	12,930	8.13	17.66	6.61	11.05	273	13.21
1977	10,063	20,651	7,899	12,752	8.41	17.25	6.60	10.65	251	12.15
1978	9,404	20,611	7,794	12,817	7.69	16.86	6.38	10.49	230	11.16
1979	9,239	20,469	7,802	12,449	7.43	16.47	6.45	10.02	247	12.07
1980	9,594	20,607	8,166	12,441	7.59	16.29	6.46	9.84	239	11.60

(a) Excludes deaths of defence personnel, whether in Australia or overseas, between September 1939 and June 1947. (b) Excess of Live births registered over Deaths registered; see also note (a). (c) Rates for years prior to 1976 are based on final census results; those for 1976 and later are subject to revision. (d) Deaths under 1 year of age; included in Deaths registered. (e) Per 1,000 live births.

PUBLIC REVENUE AND EXPENDITURE: CONSOLIDATED REVENUE FUND  
(\$'000)

Year (a)	Revenue					Expenditure						
	Common-wealth funds	Public utilities	Departmental (b)	Taxation	Territorial (c)	Total revenue	Public utilities	Interest and sinking fund	Departmental			Total expenditure
									Educa-tion	Health	Other	
1840					5	34			n.a.			30
1850					4	38		n.a.				33
1860					35	140			3			123
1870	n.a.	n.a.	n.a.	n.a.	40	196	n.a.		7	n.a.	n.a.	226
1880					72	360		40	19			403
1890					217	829		144	23			803
1900		2,612	182	244	380	5,751	1,863	880	138	198	2,049	5,231
1910	1,407	3,916	551	673	649	7,315	2,440	2,006	367	328	1,533	6,895
1920	1,197	6,364	1,188	1,688	818	11,727	5,156	4,124	829	642	1,931	13,063
1921	1,188	7,517	1,618	1,911	875	13,579	6,290	4,459	980	590	2,231	14,953
1922	1,168	7,787	1,822	1,762	870	13,814	6,120	4,875	1,112	540	2,172	15,278
1923	1,166	8,000	2,092	1,975	807	14,415	5,847	5,150	1,126	538	2,100	15,226
1924	1,171	8,776	2,173	2,347	925	15,731	6,065	5,668	1,161	544	2,229	16,190
1925	1,176	9,154	2,576	2,448	1,004	16,763	6,195	6,193	1,171	587	2,191	16,880
1926	1,177	9,280	2,831	2,836	1,083	17,616	6,577	6,596	1,010	610	2,400	17,815
1927	2,306	9,941	3,274	2,423	1,102	19,502	6,958	6,590	1,294	604	3,351	19,445
1928	1,618	10,589	3,205	2,593	1,222	19,616	7,467	6,358	1,337	606	3,246	19,669
1929	1,623	10,772	3,312	2,740	1,029	19,896	7,885	6,671	1,358	634	3,278	20,448
1930	1,547	10,596	3,134	2,906	950	19,501	8,073	6,891	1,385	649	2,872	20,537
1931	1,547	9,228	3,279	2,269	678	17,374	6,654	7,243	1,346	486	3,950	20,215
1932	1,547	8,818	2,766	2,014	585	16,071	5,724	7,015	1,098	328	4,543	19,186
1933	1,947	8,873	2,701	2,257	558	16,664	5,682	7,009	1,108	333	3,761	18,392
1934	2,147	8,867	2,240	2,737	626	16,963	5,870	7,095	1,153	309	3,560	18,541
1935	2,413	9,837	1,562	3,804	812	18,663	6,391	7,100	1,225	326	3,342	18,997
1936	2,617	10,366	1,677	4,372	767	20,067	6,756	7,135	1,331	341	3,595	19,891
1937	2,013	10,633	1,727	4,807	773	20,371	7,247	7,237	1,432	381	4,024	21,113
1938	2,097	11,148	1,980	5,190	749	21,638	7,249	7,579	1,474	380	4,158	21,659
1939	2,087	11,159	1,786	5,728	634	21,899	7,857	7,779	1,514	401	3,992	22,340
1940	2,137	11,102	1,942	5,992	632	22,240	7,662	8,021	1,545	416	4,070	22,534
1941	2,247	11,366	1,916	6,255	638	22,864	7,534	8,114	1,568	421	4,262	22,842
1942	2,207	12,133	2,204	6,222	620	23,880	8,282	8,204	1,662	436	4,293	23,877
1943	7,852	13,518	2,497	1,330	634	26,303	9,377	8,183	1,627	458	5,564	26,254
1944	7,935	13,626	2,868	1,553	700	27,178	9,870	8,185	1,747	506	5,780	27,102
1945	8,044	13,618	3,402	1,715	697	27,908	10,064	8,251	1,778	485	6,261	27,899
1946	9,960	13,303	2,519	1,936	709	28,815	10,825	8,168	2,005	1,010	5,621	28,815
1947	11,461	11,769	3,105	2,138	1,053	29,962	10,866	8,012	2,447	1,369	5,910	30,057
1948	14,515	13,242	3,575	2,354	1,202	35,421	13,996	8,089	3,298	1,841	7,280	36,125
1949	17,136	15,032	4,564	2,683	1,106	41,121	16,720	8,215	3,519	2,613	9,942	42,756
1950	22,975	17,792	5,733	3,240	1,225	51,622	20,237	8,508	4,160	3,633	13,096	51,574
1951	25,343	19,085	5,911	3,912	1,230	56,312	21,974	8,994	5,269	4,465	13,180	55,994
1952	29,923	24,335	6,863	4,633	1,300	67,910	27,490	9,741	7,262	6,269	15,696	69,094
1953	39,056	22,385	8,557	5,247	1,513	77,768	32,044	10,611	8,686	6,926	17,639	78,784
1954	38,342	29,860	8,378	6,468	1,929	86,292	35,234	12,147	9,503	7,675	18,797	86,497
1955	38,759	32,645	9,433	7,258	2,014	91,440	36,089	13,857	11,217	8,026	19,838	92,408
1956	43,373	33,969	9,779	8,036	2,498	99,225	39,184	15,451	12,482	9,344	21,501	102,886
1957	46,759	37,133	12,548	9,027	2,433	108,662	42,022	17,043	13,636	10,067	33,645	112,487
1958	51,808	34,525	13,640	10,729	2,516	114,108	40,103	19,303	15,172	11,026	25,572	116,355
1959	55,496	36,080	14,522	10,368	2,783	120,136	40,317	20,844	15,819	11,967	29,244	123,506
1960	58,871	38,575	15,696	11,834	2,878	128,776	42,418	23,053	17,282	13,565	29,861	131,587
1961	65,519	40,830	16,372	12,079	2,797	138,665	41,072	24,628	19,541	15,018	35,160	141,075
1962	73,430	42,456	16,549	12,926	3,283	149,852	42,097	27,250	21,417	14,935	40,131	151,780
1963	75,847	43,559	18,134	14,762	3,501	157,182	42,267	29,980	22,850	16,073	41,254	158,687
1964	78,988	45,376	20,948	17,604	3,751	167,888	44,247	31,771	25,880	18,705	43,430	170,681
1965	88,565	39,778	26,712	19,512	4,107	180,143	43,360	34,669	29,133	21,160	49,401	184,840
1966	103,459	45,683	28,753	22,574	4,598	206,655	47,106	37,926	34,016	23,086	56,869	206,665
1967	106,748	52,787	31,461	27,536	7,655	228,146	53,182	41,662	36,746	26,429	61,512	228,174
1968	112,617	56,226	33,135	34,916	11,845	250,738	60,728	43,864	41,224	29,294	65,362	249,909
1969	126,621	54,407	33,035	41,602	17,301	275,081	64,016	47,083	46,441	33,613	74,822	276,135
1970	141,326	62,921	36,905	50,865	23,633	318,189	71,166	51,427	55,839	41,343	87,660	318,901
1971	170,396	68,350	45,583	48,434	32,187	367,252	79,717	54,178	66,341	52,575	107,129	371,620
1972	180,132	73,446	54,131	78,490	34,992	423,999	82,410	62,029	82,472	59,862	125,260	424,890
1973	200,633	69,158	66,711	97,141	37,162	473,840	88,372	65,280	94,547	71,866	144,005	477,330
1974	232,111	85,291	76,306	126,929	43,346	567,683	104,178	69,200	115,982	100,841	168,122	573,414
1975	313,846	108,921	96,930	160,307	49,010	734,240	121,494	75,300	165,705	148,161	213,042	743,373

(a) From 1900, year ended 30 June. (b) Reimbursements, fees, etc. (c) Revenue from sales, leases, licences and royalties relating to land, mining and timber.

NOTE. This table has been replaced by a new series 'State and Local Authorities: Receipts and Outlay' on a later page.



# NET EXPENDITURE FROM LOAN FUNDS: PUBLIC DEBT (\$'000)

Year (a)	Net expenditure from loan funds on public works and services (b)							Public debt (at end of year)	
	Railways, tramways and omnibuses	Electricity supply	Harbours, rivers, light- houses, etc.	Water supplies, sewerage, drainage and irrigation	Public buildings	Other	Total	Gross amount outstand- ing	Sinking fund
1860	—	—	—	—	—	—	—	4	—
1870	—	—	—	—	—	—	—	—	—
1880	(c) 549	—	(d) 38	—	—	n.a.	(d) 802	722	n.a.
1890	3	6	2	2	(e) 76	n.a.	32	2,735	170
1900	302	395	949	152	626	1,757	23,349	754	5,139
1910	908	174	199	94	21	4,765	5,327	93,644	13,656
1920	242	204	94	21	4,765	5,327	93,644	13,656	13,656
1921	398	237	427	50	4,061	5,173	98,079	15,283	15,283
1922	1,207	183	435	89	2,996	4,910	109,920	16,740	16,740
1923	1,359	240	402	37	4,740	6,779	116,972	17,562	17,562
1924	1,303	278	871	177	5,244	7,874	125,532	18,747	18,747
1925	1,243	362	1,301	182	5,110	8,198	128,987	19,970	19,970
1926	1,540	439	1,357	156	4,667	8,157	140,022	21,309	21,309
1927	1,559	382	884	235	4,901	7,960	141,212	17,514	17,514
1928	1,902	530	1,132	256	4,577	8,397	152,856	17,798	17,798
1929	1,825	528	1,092	182	4,255	7,882	(f) 138,711	(f) 1,983	(f) 1,983
1930	1,819	529	610	108	4,226	7,291	142,389	2,081	2,081
1931	878	257	420	—	1,457	3,012	153,130	2,621	2,621
1932	263	135	1,152	—	1,055	2,624	159,416	2,618	2,618
1933	374	485	1,355	69	1,838	4,121	167,029	2,693	2,693
1934	659	492	1,606	196	2,344	5,297	171,696	743	743
1935	997	610	2,155	213	1,103	5,076	177,180	1,048	1,048
1936	946	602	2,487	169	700	4,903	180,688	1,138	1,138
1937	491	352	2,303	178	741	4,064	184,666	1,292	1,292
1938	950	201	1,843	183	1,144	4,321	187,424	614	614
1939	441	184	1,777	230	640	3,272	190,945	719	719
1940	200	104	1,615	732	974	3,624	192,461	608	608
1941	214	18	152	1,649	306	480	2,819	195,583	1,147
1942	110	25	111	605	70	437	1,359	194,718	535
1943	157	92	133	100	55	217	754	193,976	347
1944	49	31	Cr. 143	75	166	34	212	192,957	140
1945	140	11	61	150	241	492	1,094	191,790	254
1946	142	208	75	473	451	276	1,625	193,852	1,008
1947	535	332	173	1,453	772	821	4,087	198,005	1,091
1948	676	1,471	316	1,388	1,097	125	5,074	200,549	309
1949	913	2,131	449	1,626	1,099	942	7,161	207,377	126
1950	4,496	4,691	804	2,002	1,357	2,859	16,209	219,100	142
1951	3,723	6,591	1,164	4,091	2,003	3,081	20,653	246,374	17
1952	15,198	6,684	2,694	4,803	2,729	3,409	35,517	276,577	647
1953	13,533	179	2,422	4,858	5,432	8,787	35,213	306,144	1,861
1954	11,295	1,406	2,328	3,939	3,144	6,276	28,388	331,565	822
1955	9,752	1,410	1,920	5,661	3,993	6,726	29,462	355,763	442
1956	6,139	2,049	1,638	5,516	4,187	7,098	26,629	377,465	245
1957	5,519	4,200	950	7,119	5,599	9,169	32,556	410,290	112
1958	4,209	2,480	1,398	7,694	5,891	6,599	28,272	436,857	147
1959	5,711	2,200	1,428	8,395	7,410	7,199	32,342	464,237	173
1960	4,953	1,553	1,373	9,547	8,723	6,355	32,504	493,575	171
1961	4,221	400	1,966	10,314	10,479	8,037	35,418	523,070	94
1962	5,432	300	2,587	10,952	12,032	6,449	37,751	555,130	222
1963	6,204	500	2,438	10,770	13,420	5,563	38,894	587,336	485
1964	7,496	—	3,028	10,537	15,630	6,409	43,100	626,045	442
1965	6,800	794	2,822	10,957	19,948	5,457	46,779	665,620	473
1966	7,628	1,434	2,583	12,667	19,908	3,580	47,800	705,514	267
1967	9,068	2,427	1,746	13,642	18,230	5,902	51,015	748,601	216
1968	7,750	4,542	2,402	14,552	18,816	5,115	53,177	792,969	408
1969	10,547	5,679	1,190	12,560	20,116	4,765	54,859	840,343	3,015
1970	6,331	4,566	2,055	13,330	24,627	8,594	59,504	886,778	182
1971	7,194	27	2,202	15,176	25,549	13,492	63,640	924,111	582
1972	5,919	3,666	1,902	18,369	23,994	32,606	86,456	975,958	1,216
1973	4,179	4,104	2,371	23,598	32,872	21,882	89,006	1,030,060	265
1974	5,569	3,467	2,505	26,708	34,324	3,291	75,863	1,074,111	4,899
1975	6,185	4,069	3,728	24,487	45,262	6,140	89,871	1,120,313	1,037

(a) From 1900, year ended 30 June. Sinking fund at 31 March from 1900 to 1928. (b) From 1928 includes expenditure from Loan Suspense Account. (c) Total amount for the years 1877 to 1881. (d) Total amount for the years 1872 to 1881. (e) Includes expenditure prior to 1890. (f) Reduction due to operation of Financial Agreement Act of 1928.

NOTE. This table has been replaced by a new series 'State and Local Authorities: Receipts and Outlay' on a later page.

## NATIONAL WELFARE FUND: EXPENDITURE IN WESTERN AUSTRALIA

NOTE. The National Welfare Fund was established, with effect from 1 July 1943, in terms of the *National Welfare Fund Act* 1943. During the first two years of operation, only maternity allowances and funeral benefits were paid from the Fund. Expenditure on these items in Western Australia was \$341,014 in 1943-44 (maternity allowances \$322,710, funeral benefits \$18,304) and \$374,302 in 1944-45 (maternity allowances \$348,164, funeral benefits \$26,138). Under the provisions of the *National Welfare Fund Act*, 1945, effective from 1 July 1945, expenditure on age pensions (introduced in 1909), invalid pensions (1910), widows' pensions (1942), and child endowment (1941) became a charge on the Fund. Unemployment, sickness, and special benefits came into operation on 1 July 1945. Hospital benefit was first paid in 1945-46 (in respect of public hospitals from 1 January 1946, and private hospitals from 18 February 1946).

The principal expenditures from the Fund are shown separately in the table below.

(\$'000)

Year ended 30 June	Social services				Health services						Total expenditure on health services (c)	Total expenditure from National Welfare Fund (d)
	Pensions		Child endowment (a)	Unemployment, sickness, and special benefits	Total expenditure on social services	Hospital and nursing home benefits	Medical benefits	Pharmaceutical benefits	Tuberculosis campaign (b)	Milk for school children		
	Age and invalid	Widows										
1946	3,721	405	2,570	144	7,186	248	—	—	—	—	248	7,435
1947	4,010	391	2,958	339	8,165	716	—	—	20	—	736	8,901
1948	5,131	484	2,898	203	9,150	730	—	—	2	—	732	9,883
1949	5,842	561	3,620	165	10,644	979	—	24	22	—	1,025	11,670
1950	6,176	594	4,607	306	12,215	1,000	—	69	148	—	1,244	13,477
1951	6,877	632	6,539	242	14,882	1,044	14	496	473	—	2,047	16,955
1952	8,213	733	6,956	118	16,620	1,023	151	1,004	627	134	2,970	19,625
1953	9,684	808	8,106	444	19,681	1,102	237	1,108	1,201	185	3,867	23,584
1954	10,750	870	7,766	399	20,435	1,314	590	1,396	1,214	213	4,763	25,235
1955	11,519	902	8,138	286	21,516	1,491	1,156	1,537	967	253	5,432	26,967
1956	13,363	1,062	9,368	374	24,887	1,559	1,461	1,626	1,017	273	5,958	30,845
1957	14,508	1,225	8,923	896	26,281	1,544	1,590	1,624	1,123	316	6,222	32,503
1958	16,154	1,415	9,143	1,265	28,725	1,858	1,746	2,006	1,041	305	6,983	35,708
1959	17,244	1,601	10,396	1,673	31,681	2,571	1,917	2,794	1,272	364	8,948	40,679
1960	19,833	1,827	9,720	1,504	33,652	3,351	2,241	3,178	1,163	458	10,427	44,079
1961	21,586	2,104	11,402	1,309	37,180	3,817	2,339	3,630	1,111	448	11,386	48,812
1962	24,344	2,371	10,205	1,887	39,575	3,996	2,455	4,809	873	526	12,695	52,270
1963	25,582	2,377	10,485	2,006	41,203	4,189	2,657	5,161	885	584	13,501	54,705
1964	27,373	3,115	12,994	1,978	46,223	4,705	2,808	5,242	839	615	14,238	60,460
1965	29,413	3,463	13,406	1,401	48,450	4,987	3,716	5,294	822	637	15,486	64,635
1966	30,760	3,602	13,624	872	49,648	5,286	4,345	5,870	758	619	16,906	67,316
1967	33,794	4,011	15,498	855	55,001	5,881	4,944	6,719	600	698	18,998	74,666
1968	36,418	4,346	14,845	758	57,295	6,598	5,265	7,117	862	850	20,860	78,894
1969	39,404	4,786	15,540	795	61,729	7,401	5,600	8,702	645	797	23,340	85,828
1970	44,637	5,600	17,894	1,039	70,725	9,153	6,373	9,836	828	797	27,262	98,577
1971	48,979	6,172	16,423	1,699	75,279	10,256	9,782	11,215	800	835	33,246	109,216
1972	57,374	7,180	18,188	4,298	89,623	14,492	13,800	12,418	907	997	43,032	133,770
1973	76,188	10,064	21,407	8,372	119,622	19,062	15,958	13,258	824	1,086	50,827	171,763
1974	98,011	13,409	19,009	8,314	147,040	21,222	16,478	16,153	803	596	56,535	205,778
1975	138,812	18,459	19,085	24,944	213,981 (e)	25,758	19,437	19,830	1,023	—	68,542	284,016

(a) A number of endowments are paid every twelve weeks. Although in most years there are four such payments, there are some years in which five payments are made. (b) Comprises amounts paid to individuals in the form of allowances and to the State Government as reimbursements for expenditure incurred in the provision and maintenance of facilities. (c) Excludes some relatively minor expenditure not allocable among States. In 1974-75 such costs, for Australia as a whole, amounted to \$6.63 million and comprised \$1.63 million for the supply of blood products: radio-active isotopes, \$2.44 million; hearing aids for school children and pensioners, \$1.72 million; poliomyelitis vaccine, \$0.27 million; and other vaccines, \$0.57 million. (d) See footnote (c). (e) Includes expenditure of \$857,000 covering the operating deficits of certain nursing homes.

NOTE. This table has been replaced by a new series 'Commonwealth Government Cash Benefits to or for Persons in Western Australia on the next page.

## STATE AND LOCAL AUTHORITIES: RECEIPTS AND OUTLAY

NOTE. This series replaces 'Public Revenue and Expenditure: Consolidated Revenue Fund' and 'Net Expenditure from Loan Funds: Public Debt' on earlier pages.

(\$ million)

Year ended 30 June	Receipts and financing items					Outlay					
	Taxes, fees, etc.	Income from public enterprises	Property income	Grants from the Australian Government	Financing items	Total funds available	Final consumption expenditure	Gross capital formation	Transfer payments	Net advances	Total outlay
1966	52.3	14.5	9.9	146.9	99.4	323.0	104.5	156.8	54.0	7.8	323.0
1967	63.3	19.8	13.3	153.5	93.0	342.8	116.3	161.6	58.5	6.3	342.8
1968	74.6	22.7	17.8	164.8	94.0	373.9	133.4	173.5	60.4	6.6	373.9
1969	87.8	19.4	24.5	180.4	93.0	405.1	149.0	184.7	64.3	7.1	405.1
1970	103.0	24.2	32.0	203.5	115.2	477.9	176.3	220.3	72.1	9.3	477.9
1971	104.6	25.6	41.2	256.1	121.5	549.0	214.1	249.1	76.1	9.6	549.0
1972	138.3	33.8	44.6	278.6	186.8	682.2	265.7	309.7	91.1	15.7	682.2
1973	160.0	26.4	52.9	323.5	133.7	696.5	304.1	274.0	103.0	15.4	696.5
1974	195.5	24.6	63.5	394.8	129.1	807.5	381.8	306.5	111.4	7.9	807.5
1975 r	255.5	25.6	72.1	553.0	236.6	1,142.8	562.8	431.6	123.6	24.7	1,142.8
1976 r	324.8	48.9	70.8	772.5	146.6	1,363.7	736.1	469.4	140.2	17.8	1,363.7
1977 r	372.8	24.4	89.0	845.2	262.2	1,593.6	880.6	533.5	162.3	17.1	1,593.6
1978 r	425.9	23.8	108.6	974.1	289.7	1,822.3	1,011.7	598.5	193.2	18.8	1,822.3
1979 r	468.7	28.3	111.9	1,053.4	346.2	2,008.5	1,118.4	664.8	209.9	15.5	2,008.5
1980	522.7	17.2	152.7	1,165.1	344.6	2,202.1	1,272.6	707.6	222.4	—0.4	2,202.1

## COMMONWEALTH GOVERNMENT CASH BENEFITS TO OR FOR PERSONS IN WESTERN AUSTRALIA

NOTE. This series replaces 'National Welfare Fund: Expenditure in Western Australia' on the previous page.

(\$'000)

Year ended 30 June	Health			Social security and welfare							
	Hospital and nursing home benefits	Medical and pharmaceutical benefits	Other	Total	Unemployment, sickness and special benefits	Age and invalid pensions	Widows' pensions	Child endowment	Other	Total	Other services
1971	10,256	18,318	865	29,439	48,979	1,698	6,172	16,423	25,895	99,167	3,563
1972	14,494	23,153	1,029	38,676	57,374	4,298	7,234	18,188	21,599	108,693	4,258
1973	19,059	25,463	1,232	45,754	76,188	8,372	10,064	21,407	25,286	141,317	6,645
1974	21,223	28,225	600	50,048	98,011	8,314	13,409	19,009	35,450	174,193	10,219
1975	25,759	33,581	847	60,187	138,812	24,944	18,459	19,084	49,986	251,285	16,378
1976	30,810	65,279	941	97,030	183,513	41,252	24,809	22,737	62,115	334,426	23,444
1977	29,446	51,570	1,004	82,020	217,185	51,142	27,700	89,514	75,419	460,960	24,261
1978	31,574	38,510	1,018	71,102	255,432	69,023	32,290	90,809	89,378	536,932	27,460
1979	30,239	54,588	1,032	85,859	284,863	92,939	36,329	88,151	98,709	600,991	28,770
1980	33,252	59,562	1,290	94,104	312,878	100,731	40,647	89,558	111,960	655,774	28,631

## SOCIAL SERVICE BENEFICIARIES AND REPATRIATION PENSIONS: WESTERN AUSTRALIA

Year ended 30 June	Social service benefits							Repatriation pensions				
	Pensioners (a)			Family allowance (a) (b)				Disability		Service		
	Age (c) (d)	Invalid (c) (d)	Total Age and Invalid	Widow	Under 16 years of age (e) (f)	Students (g)	Total	Un-employment benefit (h)	Number (a) (i)	Amount paid \$'000	Number (a) (j)	Amount paid \$'000
1910	2,361	..	2,361					n.a.	n.a.			
1920	4,791	1,788	6,579					22,311	1,087			
1921	5,002	2,004	7,006					23,235	1,501			
1922	5,316	2,022	7,338					23,561	1,468			
1923	5,599	2,063	7,662					23,878	1,430			
1924	6,099	2,250	8,349					24,301	1,430			
1925	6,448	2,392	8,840					25,138	1,439			
1926	6,940	2,632	9,572					25,927	1,521			
1927	7,326	2,699	10,025					26,689	1,535		not applicable	
1928	7,713	2,866	10,579					27,495	1,545			
1929	8,256	3,029	11,285					28,084	1,575			
1930	8,913	3,284	12,197					28,407	1,586			
1931	10,461	3,554	14,015					28,063	1,575			
1932	11,458	3,790	15,248					26,345	1,397			
1933	11,097	3,827	14,924					25,475	1,259			
1934	11,854	4,122	15,976					24,940	1,255			
1935	12,840	4,290	17,130					24,436	1,304			
1936	13,740	4,482	18,222					23,882	1,326	375	5	
1937	14,453	4,634	19,087					22,886	1,361	923	47	
1938	15,332	4,863	20,195					23,375	1,379	1,204	73	
1939	16,278	5,116	21,394					22,617	1,394	1,454	92	
1940	19,024	3,454	22,478					21,449	1,370	1,489	103	
1941	19,423	3,425	22,848					20,388	1,343	1,545	112	
1942	19,156	3,557	22,713		68,533		68,533	19,757	1,337	1,561	129	
1943	18,575	3,580	22,155	2,596	65,777		65,777	20,245	1,506	1,454	147	
1944	18,109	3,443	21,552	2,796	66,938		66,938	22,511	1,884	1,369	144	
1945	17,713	3,414	21,127	2,894	68,316		68,316	27,686	2,105	1,343	144	
1946	18,797	3,538	22,335	2,870	69,325		69,325	37,921	2,530	1,403	173	
1947	21,162	4,002	25,164	2,570	71,968		71,968	42,127	2,856	1,580	192	
1948	22,210	4,387	26,597	2,719	75,186		75,186	40,9	44,818	3,000	1,715	290
1949	23,739	4,340	28,079	2,876	79,693		79,693	126	46,785	3,516	1,832	301
1950	24,316	4,294	28,610	2,883	133,557		133,557	267	48,878	3,776	1,953	331
1951	24,317	4,184	28,501	2,789	172,186		172,186	60	51,027	4,545	2,022	369
1952	24,782	3,964	28,746	2,676	183,257		183,257	57	52,071	5,429	2,136	449
1953	25,679	3,996	29,675	2,686	192,991		192,991	844	52,607	5,843	2,343	556
1954	27,248	4,101	31,349	2,753	202,098		202,098	427	53,352	6,174	2,468	605
1955	28,833	4,191	33,024	2,848	212,025		212,025	157	54,117	6,877	2,692	723
1956	30,244	4,425	34,669	3,015	220,792		220,792	473	54,427	6,902	3,648	964
1957	32,192	5,039	37,231	3,243	230,922		230,922	1,940	54,987	7,169	4,306	1,095
1958	33,124	5,519	38,643	3,542	237,732		237,732	2,330	55,251	8,017	4,672	1,395
1959	34,629	5,941	40,570	3,833	245,090		245,090	2,852	56,008	7,893	5,009	1,552
1960	36,575	6,152	42,727	4,039	250,449		250,449	2,512	56,644	8,471	5,344	1,751
1961	37,656	6,945	44,601	4,348	257,037		257,037	2,154	57,123	9,310	6,101	2,102
1962	39,104	7,826	46,930	4,570	266,067		266,067	2,932	57,947	10,177	7,115	2,687
1963	40,661	8,170	48,831	4,486	270,736		270,736	2,674	57,580	10,527	7,526	2,927
1964	41,819	8,306	50,125	4,734	275,910	7,865	283,775	2,677	57,047	11,564	7,754	3,177
1965	42,706	8,615	51,321	4,926	279,642	8,844	288,486	1,679	55,920	11,447	7,780	3,320
1966	43,876	8,575	52,451	5,071	286,534	8,769	295,303	785	54,560	12,637	7,757	3,571
1967	45,741	8,307	54,048	5,228	295,628	10,697	306,325	718	52,967	11,889	7,674	3,612
1968	48,850	8,310	57,160	5,482	306,492	10,999	317,491	608	51,193	11,934	7,586	3,777
1969	50,432	8,413	58,845	5,559	318,147	11,446	329,593	524	49,526	13,061	7,298	4,071
1970	56,017	7,933	63,950	6,086	322,058	11,539	333,597	474	47,993	12,811	7,783	4,491
1971	58,224	8,155	66,379	6,392	333,848	13,737	347,585	872	46,514	13,140	7,767	4,769
1972	60,523	8,485	69,008	6,795	343,455	15,452	358,907	2,808	45,079	14,413	7,864	5,298
1973	68,701	9,518	78,219	7,948	346,769	17,821	364,590	4,960	44,093	15,462	9,599	7,394
1974	76,124	10,406	86,530	8,763	343,404	17,585	360,989	2,863	42,807	17,363	10,669	10,191
1975	79,831	10,961	90,792	9,442	349,702	18,924	368,626	9,317	41,747	21,845	11,814	15,149
1976	84,087	12,265	96,352	10,027	352,998	20,151	373,149	13,598	40,619	23,118	13,472	20,560
1977	86,470	13,263	99,733	10,691	n.a.	n.a.	376,346	15,706	39,459	25,587	15,338	26,933
1978	94,491	13,653	108,144	11,494	n.a.	n.a.	377,545	20,470	38,053	28,728	16,975	33,785
1979	96,558	15,045	111,603	12,232	n.a.	n.a.	371,315(k)	29,000	36,851	28,183	18,794	38,896
1980	98,887	15,894	114,781	12,476	n.a.	n.a.	373,384(k)	29,800	35,857	29,097	21,131	45,911

(a) Number at 30 June. (b) Previously child and student endowment. Name of benefit, rates and conditions changed from 15 June 1976. (c) Prior to 30 June 1957 excludes pensioners in benevolent homes. (d) At 30 June 1940 invalid pensioners who qualified were reclassified as age pensioners. (e) Prior to 30 June 1957 excludes endowed children in institutions. (f) Child endowment commenced 1 July 1941 for second and subsequent children. From 20 June 1950 endowment extended to include first or only children. (g) From 14 January 1964 includes students aged 16 and under 21; extended to 25 years in 1976. (h) Average number of persons on benefit at end of each week. (i) Includes pensions paid to incapacitated veterans and to dependants of incapacitated or deceased veterans. (j) Comprises pensions paid to veterans and their dependants. (k) Estimated.

## BANKING AND INSURANCE

Year	Trading banks			Savings banks (a)		Insurance				
	De- positors' balances (b)	Loans (other than loans to authorised dealers in the short- term mon- ey market), advances and bills discounted (b)	Weekly debits to customers' accounts (c)	Operative accounts at end of year	Depositors' balances at end of year	Life	General (d) (e)			
						Sum insured under policies existing at end of year (f)	Industrial	Premiums	Claims	
										Ordinary (including super- annuation)
	\$'000	\$'000	\$m		\$'000	\$'000	\$'000	\$'000	\$'000	
1870	n.a.	n.a.		895	27	n.a.	n.a.			
1880	n.a.	n.a.		1,299	45	n.a.	n.a.			
1890	1,904	2,809		3,014	69	n.a.	n.a.	n.a.	n.a.	
1900	8,781	5,514		33,646	2,598	6,916	439			
1910	12,627	12,228		84,262	6,955	12,717	1,170			
1920	24,742	21,594		211,415	14,516	21,640	4,089	1,080	368	
1931	24,455	41,635	n.a.	371,662	21,735	39,906	8,353	1,914	971	
1932	28,563	39,292		206,997	20,435	39,181	8,585	1,693	655	
1933	29,785	38,433		194,095	20,129	39,447	8,918	1,786	796	
1934	32,853	38,742		192,915	20,798	40,631	9,394	1,746	801	
1935	36,206	41,061		197,611	21,858	42,899	9,945	1,929	910	
1936	38,731	43,232		208,990	23,034	45,608	10,688	2,176	1,015	
1937	39,463	44,532		217,247	23,670	48,857	11,373	2,410	1,366	
1938	41,230	45,141		225,118	24,075	51,653	11,944	2,461	1,526	
1939	41,181	47,774		232,564	24,792	53,853	12,609	2,746	1,462	
1940	42,219	47,529		233,649	23,720	54,708	13,086	2,884	1,460	
1941	47,099	45,617			238,820	25,042	55,842	13,875	2,792	1,236
1942	51,918	43,638			250,153	27,642	55,881	15,311	2,806	1,245
1943	61,135	37,827			279,469	37,769	57,865	16,656	2,347	1,014
1944	71,529	33,462			301,225	51,581	61,380	17,962	2,369	897
1945	74,846	31,504		316,565	63,526	66,254	19,024	2,565	1,154	
1946	(g) 66,652	(g) 33,726	(h) 11.6	340,737	76,578	77,608	21,036	2,890	1,223	
1947	72,490	45,388	14.2	349,091	73,250	88,016	23,054	3,503	1,737	
1948	82,032	48,754	17.4	358,709	72,365	98,891	25,139	4,188	2,089	
1949	100,971	49,904	21.4	365,130	75,070	111,213	27,127	5,071	2,053	
1950	116,458	55,301	27.4	378,670	79,225	126,332	29,503	6,281	2,916	
1951	149,244	66,680	38.6	392,790	89,345	148,724	32,460	7,782	3,947	
1952	170,923	83,353	43.6	403,678	94,342	171,007	35,257	9,950	5,877	
1953	170,234	87,353	44.2	414,288	99,589	195,499	38,110	11,558	6,171	
1954	181,863	106,429	50.8	422,480	105,229	221,568	40,240	12,449	6,224	
1955	180,895	137,830	52.4	426,637	107,258	251,543	41,487	13,707	7,349	
1956	174,070	142,156	53.9	446,419	115,868	282,139	42,114	14,723	8,199	
1957	185,576	135,074	57.1	473,548	125,386	317,264	42,535	15,169	9,416	
1958	186,478	141,198	60.4	497,690	131,896	352,360	43,003	17,064	9,416	
1959	180,300	147,106	61.5	527,079	142,998	396,322	43,279	18,679	10,899	
1960	192,076	142,064	69.7	550,966	157,246	459,740	44,325	21,569	12,771	
1961	190,094	146,244	75.7	577,619	161,424	523,636	44,745	23,583	15,022	
1962	209,274	139,204	80.4	625,070	181,056	597,892	46,754	25,133	15,113	
1963	219,952	153,528	88.2	683,417	208,812	679,161	47,983	27,319	18,262	
1964	242,268	164,878	96.4	736,009	239,766	774,550	50,588	30,336	20,234	
1965	272,430	186,000	106.3	786,340	261,654	881,652	53,565	33,347	21,429	
1966	310,432	195,190	122.4	848,562	292,871	1,005,119	57,916	37,565	23,360	
1967	355,899	212,023	138.6	905,349	330,807	1,164,613	63,960	43,330	27,131	
1968	398,837	252,627	169.1	970,120	373,602	1,383,330	69,961	48,310	31,160	
1969	462,559	280,147	209.0	1,036,180	412,984	1,651,918	75,605	56,863	37,748	
1970	558,017	323,824	246.4	1,096,466	431,877	1,948,690	83,255	68,211	41,178	
1971	544,732	351,110	295.3	1,153,420	464,611	2,307,828	91,293	78,995	47,286	
1972	552,546	357,410	318.4	1,205,448	511,457	2,670,637	95,137	87,187	53,112	
1973	693,456	443,330	355.9	1,250,576	608,133	3,137,437	101,495	90,465	58,389	
1974	829,002	604,460	439.4	1,327,699	684,974	3,660,469	105,055	107,043	75,094	
1975	906,589	673,526	515.9	1,401,485	779,427	4,344,464	108,739	133,931	119,590	
1976	1,092,350	791,376	680.0	1,443,883	897,693	5,079,654	113,938	167,499	123,779	
1977	1,376,813	927,709	814.4	1,466,200	960,548	5,854,286	115,468	210,531	144,076	
1978	1,448,206	1,163,207	975.9	1,511,092	1,048,510	r 7,142,800	r 238,042	r 187,576		
1979	1,621,852	1,368,657	1,151.8	1,539,416	1,133,627	r 7,775,500	255,483	200,508		
1980	1,742,801	1,678,121	r 1,432.3	1,579,722	1,216,182	n.y.a.	271,625	214,732		
1981	2,026,087	1,942,691	1,826.3	1,647,837	1,360,315	n.y.a.	n.y.a.	n.y.a.		

(a) From 1900, year ended 30 June. (b) Average based on amounts as at close of business each week. From 1927, year ended 30 June. (c) Weekly average for year ended 30 June. Excludes debits to Commonwealth Government accounts at city branches. From 1946-47 includes The Rural and Industries Bank of Western Australia (Rural Department). (d) From 1927, year ended 30 June. (e) Includes transactions of the Motor Vehicle Insurance Trust, which became the sole insurer in respect of motor vehicle (third party) insurance from 1 July 1949. (f) Actual date varies according to the financial year of individual insurance companies. From 1978 this dissection not available. (g) Average for nine months to 30 June. (h) Ten months ended June 1946.

## TRANSPORT: CUSTOMS AND EXCISE

Year	State Government railways (a)			Paying goods and livestock carried (e)	Private railways		Customs and excise revenue (b)			Shipping (b) (c)	
	Route kilometres at end of year (d)	Operating revenue (c)	Operating expenses (e)		Route kilometres at end of year (b) (f)		Customs	Excise	Total	Number	Net tons
		\$'000	\$'000	'000 tonnes			\$'000	\$'000	\$'000		'000
1870	—	—	—	—	—		81	—	81	131	68
1880	55	5	8	2	61		186	—	186	168	126
1890	303	90	103	62	620		356	—	356	267	420
1900	2,181	2,519	1,723	1,406	1,003	1,889	63	1,952	747	1,606	
1910	3,452	3,275	2,194	2,278	1,452	1,543	213	1,756	726	2,372	
1920	5,695	4,584	4,001	2,656	1,477	1,311	799	2,110	729	2,659	
1926	6,220	6,675	5,018	3,289	1,423	2,791	1,249	4,040	685	3,256	
1927	6,305	7,216	5,371	3,494	1,403	3,356	1,332	4,688	799	3,797	
1928	6,400	7,716	5,822	3,757	1,349	3,454	1,429	4,883	812	3,806	
1929	6,565	7,600	6,111	3,729	1,355	3,788	1,431	5,219	808	3,674	
1930	6,616	7,318	6,226	3,587	1,363	3,882	1,527	5,409	794	3,932	
1931	6,729	6,398	5,222	3,204	1,329	2,166	1,304	3,470	742	3,686	
1932	6,816	5,845	4,247	2,893	1,336	2,117	1,327	3,444	694	3,530	
1933	6,981	5,864	4,223	2,886	1,360	2,430	1,719	4,149	691	3,564	
1934	7,017	5,839	4,373	2,695	1,374	2,574	1,628	4,202	683	3,568	
1935	7,015	6,624	4,765	2,950	1,399	2,766	1,736	4,502	730	3,775	
1936	7,014	6,892	4,976	2,933	1,416	3,239	1,830	5,069	725	3,831	
1937	7,012	6,924	5,240	2,843	1,405	3,504	1,926	5,430	761	3,754	
1938	7,042	7,356	5,420	3,111	1,374	3,710	1,955	5,665	866	4,111	
1939	7,046	7,198	5,823	2,905	1,358	3,381	2,218	5,599	930	4,327	
1940	7,051	7,112	5,657	2,702	1,337	3,769	2,395	6,164	805	3,751	
1941	7,051	7,144	5,516	2,646	1,312	2,934	3,149	6,083	556	3,087	
1942	7,051	7,993	6,052	2,681	1,316	2,273	3,757	6,030	492	2,508	
1943	7,051	8,836	6,895	2,545	1,366	1,646	5,569	7,215	312	1,467	
1944	7,051	8,773	7,592	2,601	1,334	1,661	6,225	7,886	385	1,580	
1945	7,051	8,552	7,529	2,951	1,284	1,783	5,705	7,488	382	1,528	
1946	7,051	8,213	8,053	2,771	1,136	2,707	6,508	9,215	490	2,473	
1947	6,997	8,092	8,848	2,618	1,221	4,377	6,894	11,271	572	2,646	
1948	6,997	9,198	11,140	2,903	1,189	5,784	9,264	15,048	752	3,431	
1949	6,954	10,430	13,405	2,781	1,181	6,987	10,254	17,241	950	4,678	
1950	6,843	12,944	15,003	2,889	1,246	10,166	10,943	21,109	1,006	5,272	
1951	6,804	14,392	17,238	3,082	1,210	10,839	11,973	22,812	1,060	5,552	
1952	6,619	18,327	21,331	3,112	1,210	14,045	16,312	30,357	1,045	5,524	
1953	6,611	15,945	24,175	2,661	1,165	9,908	18,395	28,303	1,025	5,407	
1954	6,616	22,749	27,512	3,257	1,220	12,241	19,447	31,688	1,005	5,320	
1955	6,616	25,061	27,871	3,461	1,204	12,196	21,812	34,008	1,136	6,144	
1956	6,629	26,548	29,986	3,854	1,168	8,473	24,092	32,565	1,268	6,776	
1957	6,626	28,088	32,023	4,291	1,136	5,504	30,078	35,582	1,244	6,531	
1958	6,626	25,950	29,685	3,647	925	5,476	32,547	38,023	1,219	6,499	
1959	6,626	27,400	29,865	3,976	925	4,800	32,398	37,198	1,282	6,607	
1960	6,630	30,077	30,816	4,605	832	5,614	33,634	39,248	1,403	7,234	
1961	6,635	33,076	31,103	4,911	755	7,470	33,835	41,303	1,598	8,547	
1962	(g) 6,198	35,608	31,527	5,428	(h) 898	7,156	35,705	42,861	1,687	8,962	
1963	(g) 6,111	33,429	31,150	4,870	888	8,996	35,944	44,940	1,528	8,252	
1964	(g) 5,918	35,190	32,250	5,271	665	10,369	37,839	48,208	1,580	8,627	
1965	6,008	36,686	32,920	5,313	(i) 34	10,692	43,349	54,041	1,560	8,593	
1966	6,030	43,669	35,985	6,486	(j) 460	15,251	53,536	68,787	1,711	9,528	
1967	6,140	49,120	40,170	7,999	455	13,569	58,176	71,745	1,690	10,977	
1968	6,140	52,773	42,623	9,053	455	19,468	62,903	82,371	1,770	12,916	
1969	6,157	50,558	44,503	9,078	(k) 882	21,202	69,289	90,490	1,848	15,372	
1970	6,161	57,240	48,550	10,837	884	24,649	76,637	101,286	2,165	21,005	
1971	6,175	61,917	53,205	13,457	884	32,262	88,978	121,240	2,499	27,765	
1972	6,116	64,846	57,112	13,867	884	30,072	101,883	131,955	2,425	28,734	
1973	6,168	64,793	61,011	13,706	(l) 1,220	25,714	106,054	131,768	2,481	34,291	
1974	6,192	79,861	74,403	15,059	1,222	30,612	138,197	168,809	2,655	40,122	
1975	6,075	108,309	96,406	16,348	(m) 1,181	44,114	148,310	192,424	2,739	45,361	
1976	6,163	132,312	110,893	17,812	1,179	46,767	183,838	230,605	2,613	42,040	
1977	6,165	138,311	123,382	19,003	1,155	63,037	203,852	266,889	2,562	43,067	
1978	5,764	150,588	140,426	18,625	1,150	68,118	216,929	285,047	2,547	42,010	
1979	5,764	155,966	152,627	19,288	1,155	71,704	256,486	328,190	2,679	43,974	
1980	5,773	175,735	172,979	21,388	1,159	83,620	260,299	343,919	2,122	n.a.	
1981	5,773	182,373	186,156	20,271	n.y.a.	n.y.a.	n.y.a.	n.y.a.	n.y.a.	n.y.a.	

(a) From 1900, year ended 30 June. (b) From 1915, year ended 30 June. (c) From 1967 excludes vessels of 200 net tons and under. From 1979, figures relate to movements overseas direct or via other Australian ports. From 1980, figures relate to overseas direct movements only. (d) Open for general and passenger traffic. (e) From 1942 includes operations of Railway Road Services, which began in November 1941. (f) From 1900 to 1964 includes 446 kilometres of line open for general and passenger traffic. (g) Decrease due to proclamations of closure issued by authority of the *Railways (Cue-Big Bell and other Railways) Discontinuance Act 1960*. (h) Increase due to the transfer of all government-operated timber railways to private control. (i) Decrease due to transfer of Midland Railway Company to Western Australian Government Railways and to closure of timber and mining railways. (j) Increase due to opening of Goldsworthy-Port Hedland, Tom Price-Dampier and Westmine-Tilley iron ore railways. (k) Increase due to opening of Newman-Port Hedland iron ore railway. (l) Increase due to opening of Pannawonica-Cape Lambert iron ore railway and extensions to Goldsworthy and Tom Price railways. (m) Decrease due to closure of Westmine-Tilley iron ore railway and timber railways.

## MOTOR VEHICLE REGISTRATIONS; EXPORTS OF WHEAT

Year	New motor vehicles registered (a)				Motor vehicles on register (b)				Wheat exports (c)	
	Motor cars (d)	Utilities, panel vans, trucks and omnibuses	Motor cycles (e)	Total	Motor cars (f)	Utilities, panel vans, trucks and omnibuses	Motor cycles (e)	Total	Quantity (tonnes)	Value (\$'000)
1860									1	—
1870									—	—
1880					n.a.				408	8
1890									27	—
1900									54,839	813
1910									249,049	5,083
1920					3,404					
1921						n.a.	n.a.	n.a.	178,969	5,860
1922					4,181				281,871	6,076
1923					4,403				145,957	2,942
1924					7,280				297,330	5,085
1925					11,162				407,852	10,316
1926					15,261				358,565	8,373
1927	n.a.	n.a.	n.a.	n.a.	20,011				444,430	9,334
1928					19,451	5,819			712,884	13,989
1929					24,205	8,104			710,081	13,384
1930					27,174	9,767			679,109	12,258
1931					31,130	11,358	7,707	50,195	1,155,028	10,577
1932					27,741	10,880	6,777	45,398	1,003,383	10,647
1933					28,608	12,094	6,700	47,402	835,381	9,323
1934					27,969	12,626	6,700	47,295	635,755	6,834
1935					28,761	13,937	6,284	48,982	678,647	7,844
1936					30,578	15,530	6,597	52,705	405,430	5,607
1937					32,329	17,362	6,861	56,552	375,030	7,255
1938					34,180	19,919	6,977	61,076	599,776	9,667
1939	3,297	1,814	568	5,679	36,386	22,596	7,079	66,061	615,452	6,055
1940	2,871	1,517	399	4,787	38,039	24,441	7,199	69,679	417,214	4,669
1941	1,015	632	200	1,847	36,995	24,788	6,704	68,487	404,314	5,858
1942	250	353	74	677	29,022	21,625	4,057	54,704	266,005	4,021
1943	218	151	57	426	29,750	21,189	3,935	54,874	139,833	2,111
1944	19	1,102	109	1,230	30,295	22,459	4,324	57,078	328,138	5,813
1945	40	597	192	829	30,635	23,943	4,501	59,079	642,015	14,955
1946	101	456	271	828	31,408	28,904	6,799	67,111	367,682	11,696
1947	1,354	1,126	678	3,158	32,879	32,097	8,199	73,175	185,102	8,964
1948	2,963	1,975	1,059	5,997	35,596	35,285	8,877	79,758	525,857	33,809
1949	4,684	3,122	1,769	9,575	40,119	38,901	10,974	89,994	500,793	28,100
1950	8,926	4,707	2,346	15,979	48,632	43,206	12,897	104,735	585,406	33,384
1951	8,201	6,610	2,802	17,613	56,235	47,908	14,535	118,678	830,346	51,688
1952	8,836	5,750	2,740	17,326	64,277	52,627	16,047	132,951	730,002	45,728
1953	6,879	4,881	1,416	13,176	69,917	56,445	15,565	141,927	634,639	40,347
1954	9,926	5,601	1,258	16,785	78,312	60,362	15,243	153,917	185,066	11,272
1955	12,394	5,993	1,202	19,589	90,255	63,870	14,662	168,787	526,212	27,478
1956	10,100	5,203	1,089	16,392	99,206	62,809	12,959	174,974	619,779	28,860
1957	9,321	4,418	1,192	14,931	104,506	63,315	12,731	180,552	1,273,578	61,291
1958	10,140	5,562	1,702	17,404	111,825	63,598	12,631	188,054	725,131	40,861
1959	10,389	5,140	2,071	17,600	119,957	65,588	12,814	198,359	639,647	33,113
1960	13,492	5,695	1,949	21,136	130,476	68,702	12,876	212,054	999,164	49,442
1961	15,161	5,542	1,080	21,783	141,612	70,974	12,589	225,175	1,428,272	71,280
1962	17,082	5,833	902	23,817	155,447	74,224	12,390	242,061	2,010,766	104,356
1963	23,175	6,367	754	30,296	169,800	75,500	11,500	256,800	1,380,372	72,197
1964	24,958	7,013	628	32,599	186,200	77,700	10,200	274,100	1,497,453	77,881
1965	23,304	6,897	553	30,754	197,800	78,500	8,900	285,200	1,102,420	56,955
1966	23,418	9,170	706	33,294	212,600	83,300	8,400	304,300	1,887,996	96,515
1967	27,922	9,404	1,158	38,484	231,200	86,300	8,400	325,900	2,312,777	126,918
1968	33,368	10,448	1,525	45,341	252,300	90,800	8,900	352,000	2,373,195	121,764
1969	35,379	11,018	1,539	47,936	275,300	94,500	9,600	379,400	1,521,376	77,987
1970	37,764	11,138	1,945	50,847	301,000	99,900	10,800	411,700	1,814,787	8,593
1971	37,769	10,872	2,718	51,359	328,500	104,900	12,200	445,600	2,670,890	130,564
1972	37,274	9,819	3,985	51,078	346,300	104,600	14,200	465,100	2,587,504	128,132
1973	36,904	11,425	4,914	53,243	364,400	107,400	16,800	488,600	2,249,934	111,744
1974	40,302	12,241	7,062	59,605	389,300	112,700	21,000	523,000	2,139,973	211,333
1975	41,474	13,693	6,613	61,780	414,800	125,000	24,600	564,400	3,241,895	409,758
1976	40,338	15,863	5,731	61,932	437,200	140,000	27,600	604,800	3,215,792	375,897
1977	44,363	17,362	3,887	65,612	473,731	153,174	28,022	654,927	3,009,101	316,258
1978	40,990	16,538	3,339	60,867	500,365	167,107	28,051	695,523	3,795,969	351,190
1979	40,882	14,025	2,713	57,620	518,705	174,064	26,916	719,685	2,208,985	257,414
1980	40,232	13,716	4,600	58,548	535,613	179,844	29,531	744,988	4,205,774	615,944
1981	41,660	15,223	6,088	62,971	552,552	187,599	33,009	773,160	n.y.a.	n.y.a.

(a) Year ended 30 June. (b) From 1929, at 30 June; for earlier years, at various dates. For years before 1946, excludes Commonwealth Government-owned vehicles; from 1946, includes Commonwealth Government-owned vehicles other than those of defence services. From 1956 to 1976, series based on the results of the periodic census of motor vehicles. (c) From 1920, year ended 30 June; from 1978, excludes interstate exports. (d) From 1959, includes station wagons previously included with commercial vehicles. (e) Including motor scooters. (f) From June 1956, includes station wagons previously included with commercial vehicles.

## EXPORTS OF CERTAIN COMMODITIES

Year (a)	Wool				Meats — Fresh, chilled or frozen					
	Greasy (b)		Degreased		Beef and veal		Mutton and lamb		Pigmeat	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	tonnes	\$'000	tonnes	\$'000	tonnes	\$'000	tonnes	\$'000	tonnes	\$'000
1840	23	5	—	—	—	—	—	—	—	—
1850	141	31	—	—	—	—	—	—	—	—
1860	298	99	—	—	—	—	—	—	—	—
1870	811	179	(c)	(c)	—	—	—	—	—	—
1880	1,970	543	—	—	—	—	—	—	—	—
1890	3,161	523	—	—	—	—	—	—	—	—
1900	3,927	505	198	36	(d)	(d)	(d)	(d)	(d)	(d)
1910	11,692	1,894	191	40	—	—	—	—	—	—
1920	25,530	7,218	1,504	657	300	33	—	—	—	—
1921	19,073	4,593	492	183	2,614	248	54	7	20	5
1922	24,726	5,673	1,896	731	1,124	79	—	—	—	—
1923	17,815	5,986	1,202	479	4,516	305	393	55	—	—
1924	19,214	8,028	688	446	4,829	272	202	26	—	—
1925	15,296	7,030	586	443	3,223	198	—	—	—	—
1926	21,783	6,703	756	353	3,683	240	—	—	—	—
1927	23,646	6,694	752	342	3,038	198	—	—	—	—
1928	27,398	9,734	381	192	5,001	272	103	15	—	—
1929	25,493	7,615	382	207	4,224	226	—	—	—	—
1930	28,022	5,422	465	136	5,162	272	—	—	—	—
1931	31,478	4,652	629	121	5,132	244	388	35	95	7
1932	29,298	4,540	892	151	5,098	235	958	103	554	53
1933	30,931	4,871	1,222	236	6,534	276	174	15	430	37
1934	31,751	4,131	1,237	491	5,716	234	613	49	303	29
1935	36,537	6,479	1,565	348	5,476	233	2,258	236	542	55
1936	35,602	8,892	1,398	451	7,727	321	2,521	282	703	65
1937	26,455	7,854	1,110	475	5,092	249	2,066	247	592	67
1938	24,245	5,877	1,227	446	5,191	314	3,949	470	373	52
1939	31,030	6,072	1,636	469	7,485	497	5,341	638	580	80
1940	29,610	7,603	1,655	661	4,826	329	4,665	533	2,263	324
1941	9,064	2,601	1,270	518	5,583	407	4,396	496	6,015	851
1942	34,355	9,836	2,235	1,030	3,576	327	3,684	435	4,670	682
1943	12,934	4,163	1,239	594	—	—	3,985	458	1,053	155
1944	31,145	10,842	2,095	917	1,445	190	6,664	763	1,568	238
1945	23,613	8,082	2,216	1,025	1,202	168	4,002	410	1,697	254
1946	49,070	17,136	5,328	2,778	4,317	558	2,269	275	3,401	545
1947	34,104	15,561	7,918	4,960	6,358	691	4,081	409	1,306	248
1948	36,380	27,801	7,291	5,443	6,353	604	5,079	584	303	53
1949	38,972	36,717	6,163	6,352	8,056	840	4,607	608	624	179
1950	37,832	40,071	7,934	10,852	8,625	1,183	2,392	485	163	59
1951	36,619	96,493	5,014	16,066	7,699	1,221	939	217	279	113
1952	41,483	57,291	5,150	10,389	6,028	1,135	1,044	301	424	232
1953	45,772	67,759	5,717	11,363	5,016	1,437	6,589	1,463	463	303
1954	45,677	71,346	5,406	10,914	6,148	1,748	3,309	875	215	152
1955	43,796	59,296	6,015	11,267	6,776	2,038	3,225	1,328	1,049	532
1956	51,387	57,894	7,595	12,419	7,601	2,343	6,602	2,156	743	482
1957	49,252	71,251	8,503	16,259	4,127	1,221	5,788	1,741	733	588
1958	43,750	57,224	8,417	15,462	11,025	3,302	5,083	1,900	2,324	1,462
1959	50,408	46,313	9,872	12,224	10,535	4,342	9,944	3,177	1,983	1,178
1960	50,396	58,137	12,442	19,820	13,597	6,742	8,735	2,378	1,188	953
1961	59,830	59,290	11,851	15,552	12,413	6,141	11,367	3,901	1,894	1,501
1962	62,094	68,177	11,490	15,688	12,544	6,299	8,468	2,436	3,151	2,025
1963	59,617	66,401	11,441	15,706	17,268	9,382	7,428	2,401	2,061	1,404
1964	72,240	97,138	10,388	17,101	20,528	11,497	5,385	1,895	861	718
1965	68,861	83,030	10,245	15,264	19,360	11,730	5,040	1,981	571	516
1966	87,853	101,905	9,845	13,223	18,115	12,108	10,319	4,357	420	376
1967	97,098	114,052	9,788	12,943	16,912	11,987	9,652	3,723	565	470
1968	113,224	113,868	11,484	12,549	16,821	12,995	13,153	4,745	547	474
1969	132,034	142,065	12,354	15,885	20,210	16,939	21,523	7,218	642	564
1970	120,224	117,952	12,554	17,024	23,645	21,508	29,661	11,271	1,437	1,175
1971	119,137	89,752	9,251	8,537	20,257	17,626	24,244	9,396	1,126	895
1972	145,803	109,263	13,481	11,197	24,435	22,528	42,994	17,645	2,503	1,995
1973	136,110	204,455	10,346	16,264	33,325	36,614	39,853	26,103	7,630	6,382
1974	112,536	242,357	8,577	20,973	34,778	43,039	27,189	23,682	5,939	5,772
1975	102,621	148,153	11,448	19,478	31,083	25,993	33,240	22,107	2,283	3,037
1976	140,581	207,528	12,667	23,773	35,732	32,693	52,120	34,009	2,451	3,696
1977	154,779	291,142	14,895	40,022	53,051	53,291	60,373	48,913	1,292	1,968
1978	112,075	219,402	10,996	31,919	57,827	64,896	42,532	40,885	620	984
1979	136,136	282,985	14,049	r 43,481	r 51,932	r 90,216	26,250	31,059	382	693
1980 (e)	124,746	316,614	16,516	61,943	41,372	93,547	44,699	51,230	204	460

(a) From 1920, year ended 30 June. (b) For 1890 and earlier years includes degreased wool for which figures are not available separately. (c) See note (b). (d) Separate particulars not available. Total exports of fresh meats were 84 tonnes valued at \$9,164. (e) Figures represent overseas exports only.



EXPORTS OF CERTAIN COMMODITIES — *continued*

Year (a)	Flour (b)		Butter		Potatoes		Fresh fruit (c)	Cattle	Sheep
	Quantity	Value	Quantity	Value	Quantity	Value	Value	Value	Value
	tonnes	\$'000	tonnes	\$'000	tonnes	\$'000	\$'000	\$'000	\$'000
1860	11	—	—	—	71	1	—	—	4
1870	—	—	—	—	26	—	—	—	—
1880	n.a.	2	—	—	—	—	—	—	—
1890	—	—	—	—	—	—	—	1	2
1900	47	49	4	1	113	1	1	—	2
1910	2,559	49	77	12	18	—	11	16	9
1920	117,254	5,045	38	17	1,637	54	300	73	28
1926	83,333	2,581	—	—	1,647	43	464	30	31
1927	85,294	2,314	1	—	1,540	44	669	32	50
1928	77,208	2,009	1	—	436	12	384	70	58
1929	72,265	1,780	36	14	1,327	32	1,067	38	52
1930	62,659	1,540	21	7	5,037	151	312	1	46
1931	77,713	1,266	20	5	4,897	47	604	3	25
1932	80,061	1,156	663	179	724	14	861	3	28
1933	78,159	1,105	1,042	280	487	5	665	1	35
1934	58,599	781	1,000	195	1,708	17	673	—	26
1935	77,986	1,127	1,042	148	2,375	49	826	1	44
1936	60,633	972	1,033	246	8,440	121	905	1	47
1937	78,150	1,662	738	183	7,107	119	670	1	56
1938	73,629	1,605	1,642	472	5,030	55	549	—	74
1939	80,766	1,165	1,875	462	14,961	282	1,175	1	73
1940	83,159	1,301	1,873	490	11,953	214	740	—	65
1941	107,588	2,185	1,748	460	18,501	373	282	2	112
1942	77,087	1,681	1,676	428	10,452	213	114	1	97
1943	70,412	1,581	169	47	6,410	139	139	1	—
1944	96,941	2,344	919	262	772	22	96	27	—
1945	92,438	2,505	964	369	17,939	581	132	2	1
1946	106,088	4,667	1,283	502	13,219	446	488	2	91
1947	117,661	7,628	920	383	12,939	484	1,445	27	362
1948	127,002	11,326	2,043	1,000	18,623	681	1,688	10	347
1949	119,025	10,516	2,075	1,047	13,723	431	1,452	11	374
1950	105,065	8,335	1,475	864	10,090	384	1,780	5	426
1951	144,914	11,774	498	312	11,181	506	2,295	9	616
1952	146,584	13,669	144	93	13,514	733	2,853	23	631
1953	159,883	15,090	155	126	12,860	750	4,556	23	501
1954	134,126	11,704	170	141	16,026	1,300	3,300	29	568
1955	109,172	7,219	168	142	9,020	512	3,845	68	612
1956	117,409	7,766	255	206	2,275	171	3,393	177	625
1957	115,658	7,474	177	156	7,728	736	4,598	243	923
1958	101,448	6,907	200	169	13,998	832	3,725	308	841
1959	94,854	6,337	178	166	8,577	368	3,609	396	764
1960	79,697	5,100	191	183	9,612	436	2,437	325	845
1961	122,839	7,840	303	247	7,821	437	4,636	318	881
1962	88,889	5,891	756	532	10,328	632	2,818	55	1,254
1963	67,652	4,645	247	228	18,032	810	4,982	160	1,495
1964	62,677	4,396	138	126	9,925	353	4,016	331	1,433
1965	83,826	5,926	166	159	12,935	841	5,165	427	1,376
1966	49,130	3,378	1,062	732	21,362	1,393	4,838	283	1,633
1967	34,804	2,507	192	201	17,478	692	5,704	381	1,771
1968	41,918	2,944	225	232	13,142	622	4,068	1,229	2,191
1969	35,100	2,433	231	254	21,944	1,149	6,552	972	2,943
1970	31,173	2,257	216	243	19,888	831	6,054	760	2,876
1971	26,670	1,958	266	325	9,390	510	7,208	1,159	2,710
1972	18,882	1,345	234	297	8,600	371	5,245	1,865	3,871
1973	9,798	859	237	311	(d) 4,911	(d) 334	6,135	1,661	7,959
1974	11,232	1,380	228	278	(e) 9,576	(e) 1,113	5,835	2,111	12,539
1975	19,281	3,439	190	281	8,527	1,217	7,547	1,498	12,862
1976	11,658	2,022	224	345	12,196	1,636	6,047	1,464	14,436
1977	11,355	2,051	180	310	7,190	1,127	5,285	2,533	(f) 34,905
1978	8,291	1,481	164	245	5,853	390	5,976	3,071	35,985
1979	7,872	1,660	134	225	2,735	r 373	r 8,703	3,182	45,915
1980	(g) 4,342	(g) 1,055	(g) 38	(g) 63	(g) 5,292	(g) 616	(g) 10,551	1,748	91,763

(a) From 1920, year ended 30 June. (b) From 1973, figures include meal and flour of wheat or maslin: from 1978, figures include meal and flour of all cereal grains. (c) Includes tomatoes for 1933 and earlier years. (d) Some interstate details for 1973 included in 1974. (e) See footnote (d). (f) Excludes interstate exports. Details are not available for publication. (g) Figures represent overseas exports only.

EXPORTS OF CERTAIN COMMODITIES — *continued*

Year (a)	Skins and hides		Timber (b)	Rock lobster tails (c)		Pearl-shell (d)		Iron and steel (e)
	Value	Quantity		Value	Quantity	Value	Quantity	
	\$'000	'000 cu m		\$'000	tonnes	\$'000	tonnes	
1850	1	—	2	—	—	—	—	—
1860	—	2	10	—	—	—	—	—
1870	—	6	35	—	—	75	19	—
1880	8	19	133	—	—	731	79	—
1890	49	33	164	—	—	1,257	173	—
1900	150	162	916	—	—	749	173	7
1910	482	342	1,945	—	—	1,488	492	5
1920	1,246	143	931	—	—	1,702	671	16
1921	759	278	2,274	—	—	1,171	470	26
1922	730	235	2,082	—	—	1,546	508	16
1923	1,092	224	1,995	—	—	1,294	429	18
1924	1,040	315	2,735	—	—	1,447	487	6
1925	955	335	2,956	—	—	1,182	469	13
1926	883	340	3,046	—	—	1,309	465	9
1927	752	371	3,316	—	—	1,245	425	10
1928	1,106	294	2,531	—	—	969	332	7
1929	1,101	216	1,921	—	—	1,093	345	3
1930	738	186	1,615	—	—	984	331	3
1931	539	117	1,015	—	—	1,032	334	2
1932	395	87	722	—	—	622	194	1
1933	480	63	523	—	—	1,049	294	1
1934	771	115	972	—	—	856	196	7
1935	640	151	1,270	—	—	987	189	3
1936	1,061	159	1,356	—	—	984	214	3
1937	1,143	161	1,397	—	—	928	247	7
1938	985	214	1,860	—	—	1,259	336	12
1939	736	162	1,436	—	—	1,149	212	15
1940	745	143	1,251	—	—	856	153	31
1941	580	172	1,546	—	—	696	153	35
1942	772	148	1,369	—	—	590	142	19
1943	348	100	1,189	—	—	6	1	5
1944	680	103	1,216	—	—	2	1	23
1945	537	81	1,131	—	—	—	—	100
1946	1,274	96	1,429	—	—	13	8	9
1947	2,131	98	1,719	—	—	127	120	99
1948	2,048	102	2,230	—	—	342	340	89
1949	2,134	91	1,986	n.a.	(f) 500	415	367	59
1950	2,329	81	1,949	518	463	355	248	95
1951	5,294	66	1,783	1,436	1,517	345	274	83
1952	3,194	68	2,075	1,311	1,861	417	406	58
1953	3,942	112	4,147	1,329	2,085	535	612	357
1954	3,295	109	4,480	1,461	2,342	623	708	279
1955	2,921	99	3,847	1,532	2,490	700	820	602
1956	3,274	129	5,598	1,601	3,022	811	999	530
1957	4,650	132	6,215	1,618	3,514	1,101	1,391	1,174
1958	3,898	158	7,496	2,136	3,965	1,147	1,381	2,470
1959	3,489	183	8,415	2,715	5,281	789	772	4,218
1960	4,767	174	7,760	2,996	6,499	637	707	11,198
1961	3,828	157	7,175	2,316	5,881	573	502	12,781
1962	4,580	161	7,528	3,607	9,778	453	320	13,826
1963	4,339	155	7,241	3,490	8,910	388	289	15,107
1964	4,966	149	6,813	3,416	9,211	168	112	15,029
1965	4,177	133	6,279	2,672	10,592	162	133	17,933
1966	5,447	69	3,687	3,193	13,821	155	123	14,458
1967	5,377	139	7,475	3,643	13,873	218	189	15,658
1968	4,699	85	4,947	3,919	17,989	212	147	11,442
1969	6,013	88	5,068	3,038	17,133	212	125	27,002
1970	7,968	96	5,666	2,976	15,695	255	173	34,306
1971	5,395	79	4,808	3,155	19,413	196	132	34,571
1972	5,356	101	6,440	3,425	24,626	202	123	36,415
1973	13,945	113	7,087	3,171	20,919	218	131	36,529
1974	13,536	100	7,407	2,656	18,511	145	105	60,811
1975	11,195	109	9,252	3,328	25,258	170	137	71,493
1976	13,728	94	9,823	3,128	27,777	163	123	60,765
1977	24,708	78	10,152	4,071	47,061	137	90	74,508
1978	21,147	59	8,885	3,902	48,043	172	182	50,285
1979	29,280	r 66	r 10,508	4,170	51,064	103	123	72,591
1980	(g) 34,716	72	12,226	3,626	50,448	307	811	83,447

(a) From 1920, year ended 30 June. (b) Excludes plywood and veneers and small quantities of timber for which details are not recorded. For the years 1910 to 1921, figures are approximate. (c) For years 1950 to 1952, overseas exports only. For 1953 to 1960 includes small interstate consignments of cooked whole rock lobsters. (d) From 1973, overseas exports only. (e) Principally pig-iron, cast iron and basic shapes and sections of iron and steel. (f) Estimated. (g) Figures represent overseas exports only.

EXPORTS OF CERTAIN COMMODITIES — *continued*

Year (a)	Gold mint bullion (b)		Lead and zinc ores (c) (d)	Tin ore and concentrates	Asbestos (crude and fibre)		Manganese ore and concentrates		Iron ore and concentrates		Ilmenite concentrates (including leucocene) (e)	
	Quantity	Value (f)			Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	kg	\$'000			tonnes	\$'000	'000 tonnes	\$'000	'000 tonnes	\$'000	'000 tonnes	\$'000
1850	—	—	—	—	—	—	—	—	—	—	—	—
1860	—	—	2	—	—	—	—	—	—	—	—	—
1870	—	—	29	—	—	—	—	—	—	—	—	—
1880	—	—	31	—	—	—	—	—	—	—	—	—
1890	715	173	4	11	—	—	—	—	—	—	—	—
1900	31.103	7.589	—	76	—	—	—	—	—	—	—	—
1910	10.389	2.835	4	93	—	—	—	—	—	—	—	—
1920	1.275	452	102	129	—	—	—	—	—	—	—	—
1930	4	1	19	29	—	—	—	—	—	—	—	—
1936	23.981	13.385	—	18	—	—	—	—	—	—	—	—
1937	28.273	15.819	—	16	—	—	—	—	—	—	—	—
1938	33.436	18.598	1	20	281	37	—	—	—	—	—	—
1939	36.360	21.240	1	11	272	26	—	—	—	—	—	—
1940	36.329	24.056	2	14	188	17	—	—	—	—	—	—
1941	37.386	25.096	2	12	148	15	—	—	—	—	—	—
1942	30.326	20.590	2	6	74	7	—	—	—	—	—	—
1943	23.514	15.744	1	5	89	8	—	—	—	—	—	—
1944	10.855	7.250	1	6	92	8	—	—	—	—	—	—
1945	—	—	1	5	386	36	—	—	—	—	—	—
1946	—	—	—	8	1.081	104	—	—	—	—	—	—
1947	—	—	5	12	637	65	—	—	—	—	—	—
1948	11.073	7.656	146	17	1.201	148	—	—	—	—	—	—
1949	—	—	235	31	1.178	179	2	22	—	—	—	—
1950	2	2	272	49	894	204	10	126	—	—	—	—
1951	—	—	263	62	1.568	378	11	154	—	—	—	—
1952	12.286	13.143	1.369	107	2.620	709	8	115	53	102	—	—
1953	23.608	24.798	1.681	153	3.006	990	14	256	553	1,079	—	—
1954	13.001	13.230	270	97	3.200	986	27	829	592	1,157	—	—
1955	19.222	19.338	108	146	3.792	788	35	804	589	1,149	—	—
1956	12.752	12.842	888	322	7.534	1,440	56	1,271	480	936	—	—
1957	23.950	24.119	960	293	10.727	2,140	59	1,551	334	649	—	—
1958	6.470	6.511	410	166	11.743	2,920	76	2,501	446	870	89	1,011
1959	4.106	4.118	238	304	10.737	2,166	57	1,628	598	1,169	66	648
1960	18.662	18.738	229	415	15.407	3,111	80	2,224	809	1,601	90	713
1961	78.754	79.271	83	325	10.776	2,364	48	1,267	1,035	2,101	132	1,198
1962	14.090	12.195	45	563	12.850	2,753	110	2,945	1,069	2,209	159	1,441
1963	12.970	13.048	33	532	12.610	2,799	53	1,390	1,495	2,898	183	1,717
1964	11.975	12.045	18	1,080	8.069	1,767	27	695	1,381	2,743	263	2,571
1965	15.956	16.127	662	1,229	11.131	2,210	77	1,747	1,562	3,040	330	3,194
1966	25.909	26.147	124	1,521	8.064	1,702	106	2,404	2,657	6,967	430	4,181
1967	14.930	15.107	177	2,214	5.985	1,229	193	4,161	8,530	50,890	443	4,440
1968	11.602	11.816	58	2,330	—	—	164	3,408	14,563	104,506	462	4,645
1969	11.228	12.701	161	1,843	65	8	179	3,624	19,898	151,797	557	5,751
1970	12.037	13.874	41	1,386	56	4	161	3,086	31,542	233,580	573	6,068
1971	14.665	15.760	—	1,511	45	10	159	2,755	46,273	341,702	563	6,631
1972	17.646	21.950	—	2,043	40	3	(g)	(g)	48,658	347,500	580	7,416
1973	16.314	30.193	6	2,277	—	—	(g)	(g)	66,036	420,255	595	7,696
1974	10.093	27.393	15	2,732	—	—	(g)	(g)	79,286	488,239	728	9,774
1975	9.263	36.666	—	3,019	—	—	(g)	(g)	88,070	699,843	672	9,893
1976	13.659	50.527	—	2,538	—	—	(g)	(g)	83,090	772,199	647	9,995
1977	9.980	36.863	—	3,939	81	39	(g) 72	(g) 9	84,939	900,987	1,184	20,155
1978	10.344	50.906	—	4,947	(h)	(h)	(g)	(g)	80,128	935,018	986	17,653
1979	n.a. (h)	99.708	—	5,074	(h)	(h)	(g)	(g)	84,016	978,315	883	17,475
1980 (h)	n.a. (h)	56.317	220	5,841	—	—	(g)	(g)	76,725	1,025,660	1,119	25,433

(a) From 1920, year ended 30 June. (b) Gold sold abroad before consignment is not recorded as an export until actually shipped. (c) Includes silver-lead and silver-lead-zinc ores and concentrates. (d) From 1973, figures exclude interstate exports of lead ores and concentrates, and from 1978 interstate exports of zinc ores and concentrates. (e) From 1972, figures exclude overseas exports of beneficiated ilmenite; from 1978, figures also exclude interstate exports of all ilmenite and leucocene. (f) Includes additional premiums on sales of industrial gold. (g) Overseas details are not available for publication. (h) Represents overseas exports only. (i) Includes all processed gold, but excludes gold ores and concentrates.

EXTERNAL TRADE  
(\$'000)

Year (a)	Imports (b)			Exports (b) (c)			Excess of—		Ships' stores
	Overseas	Interstate	Total	Overseas	Interstate	Total	Imports	Exports	
1850	n.a.	n.a.	125	n.a.	n.a.	44	80	..	n.a.
1860	318	20	338	160	16	175	163	..	3
1870	260	167	427	348	46	394	33	..	8
1880	349	358	707	736	252	988	..	280	11
1890	1,025	724	1,749	961	369	1,330	419	..	14
1900	6,574	5,350	11,924	11,246	2,250	13,496	..	1,572	208
1910	8,750	7,067	15,817	11,679	4,627	16,306	..	489	294
1920	9,918	14,819	24,737	28,918	2,392	31,311	..	6,574	827
1926	15,792	17,133	32,925	25,223	2,876	28,100	4,826	..	1,064
1927	18,894	17,858	36,752	26,135	2,810	28,946	7,806	..	1,358
1928	18,023	18,553	36,575	32,505	2,674	35,179	1,396	..	1,302
1929	18,906	21,201	40,108	30,603	2,411	33,014	7,094	..	1,358
1930	17,758	19,805	37,563	32,009	2,213	34,223	3,341	..	1,316
1931	9,165	13,639	22,804	33,306	1,550	34,856	..	12,052	1,095
1932	6,926	15,854	22,780	29,633	1,826	31,459	..	8,679	1,133
1933	9,542	16,740	26,282	28,037	1,916	29,953	..	3,671	1,122
1934	8,889	18,554	27,443	31,132	2,427	33,559	..	6,116	1,024
1935	10,203	20,290	30,493	30,002	2,650	32,652	..	2,158	1,106
1936	12,688	22,073	34,761	33,023	3,665	36,689	..	1,928	1,095
1937	14,144	24,742	38,886	34,592	6,361	40,953	..	2,067	1,029
1938	15,986	25,879	41,865	38,944	6,057	45,001	..	3,135	1,200
1939	12,275	25,329	37,604	34,149	10,815	44,964	..	7,360	1,049
1940	12,568	27,450	40,017	19,256	28,518	47,774	..	7,756	1,380
1941	9,710	27,519	37,229	16,900	30,808	47,708	..	10,479	1,971
1942	10,391	26,110	36,501	23,157	25,241	48,398	..	11,897	2,305
1943	7,383	24,803	32,186	10,625	20,117	30,741	1,445	..	1,983
1944	7,770	26,628	34,399	22,845	13,472	36,317	..	1,919	2,747
1945	9,215	26,863	36,079	24,765	11,533	36,298	..	219	2,508
1946	11,018	32,238	43,256	38,917	11,662	50,579	..	7,322	2,511
1947	18,929	42,253	61,182	46,015	11,459	57,474	3,708	..	1,966
1948	34,311	51,329	85,640	97,389	11,599	108,989	..	23,349	2,474
1949	44,075	61,182	105,258	96,982	9,495	106,477	..	1,220	4,710
1950	68,844	70,044	138,887	106,590	12,421	119,011	19,876	..	4,720
1951	80,517	95,828	176,345	197,686	18,780	216,466	..	40,122	7,249
1952	120,474	124,209	244,683	151,562	35,404	186,966	57,717	..	8,419
1953	59,748	137,213	196,961	166,286	49,659	215,945	..	18,984	10,321
1954	85,051	165,374	250,425	136,849	39,190	176,039	74,386	..	7,266
1955	101,295	182,110	283,405	137,013	47,310	184,323	99,082	..	7,865
1956	92,963	177,952	270,915	152,286	68,466	220,752	50,164	..	10,592
1957	80,423	188,680	269,103	216,599	81,545	298,144	..	29,041	12,902
1958	91,775	195,103	286,879	179,516	79,836	259,352	27,527	..	11,602
1959	89,972	202,430	292,402	174,585	68,919	243,504	48,898	..	9,482
1960	92,363	246,696	339,059	231,766	77,278	309,043	30,016	..	8,954
1961	110,531	245,474	356,005	309,332	89,922	399,254	..	43,249	10,285
1962	100,178	245,208	345,386	287,619	84,626	372,245	..	26,859	9,379
1963	112,640	313,712	426,351	246,823	91,636	338,459	87,892	..	7,904
1964	121,677	323,176	444,854	286,132	101,811	387,943	56,911	..	9,733
1965	153,540	343,899	497,439	243,078	119,954	363,033	134,407	..	9,009
1966	175,690	403,054	578,744	314,404	119,619	434,023	144,721	..	10,058
1967	159,390	474,852	634,242	421,325	116,030	537,355	96,887	..	10,936
1968	206,980	527,052	734,031	475,260	124,505	599,765	134,266	..	14,824
1969	203,533	562,312	765,846	546,366	149,892	696,258	69,588	..	14,327
1970	242,299	640,189	882,487	675,027	149,861	824,888	57,600	..	15,092
1971	278,344	726,778	1,005,122	862,421	163,812	1,026,233	..	21,111	20,561
1972	283,263	787,788	1,071,051	946,504	156,303	1,102,807	..	31,756	22,477
1973	227,305	786,177	1,013,483	1,154,359	173,839	1,328,198	..	314,715	17,542
1974	368,910	939,361	1,308,272	1,414,968	222,208	1,637,176	..	328,904	29,224
1975	577,416	1,134,510	1,711,926	1,880,082	253,424	2,133,506	..	421,580	50,157
1976	637,439	1,418,726	2,056,165	2,117,898	290,733	2,408,631	..	352,466	46,638
1977	829,411	1,641,545	2,470,955	2,596,107	305,836	2,901,943	..	430,987	64,141
1978	937,350	1,828,510	2,765,860	2,588,954	355,151	2,944,105	..	178,245	71,009
1979	1,161,164	2,044,447	3,205,611	2,820,134	446,208	3,266,343	..	60,732	72,611
1980	1,449,683	2,337,808	3,787,491	3,854,092	635,388	4,489,480	..	701,989	126,176

(a) From 1920, year ended 30 June. (b) From 1976, excludes interstate value of horses. Details are not available for publication. (c) Excludes ships' stores.

## LAND TENURE; LIVESTOCK; WOOL PRODUCTION

Year	Land alienated and land in process of alienation (a)	Land held under lease or licence (a) (b)	Livestock (c)				Wool production (d)	
			Horses	Cattle	Sheep	Pigs	Quantity	Gross value (e)
	'000 hectares	'000 hectares	'000	'000	'000	'000	tonnes	\$'000
1829	212	—	—	—	1	—	n.a.	—
1830	256	—	—	1	8	—	n.a.	—
1840	647	—	1	2	31	2	n.a.	—
1850	538	—	3	13	128	3	n.a.	—
1860	614	2.251	10	32	260	11	298	n.a.
1870	593	4.953	22	45	609	13	811	—
1880	860	18.179	35	64	1.232	24	1.970	—
1890	2.159	42.388	44	131	2.525	29	3.161	—
1900	2.679	35.360	68	339	2.434	62	4.323	—
1910	7.013	67.667	134	825	5.159	58	13.210	2.141
1920	9.317	104.252	179	850	6.533	61	18.947	4.552
1926	12.253	93.306	166	827	7.459	70	25.007	7.148
1927	12.845	94.762	165	847	8.447	60	28.441	10.170
1928	13.485	96.085	161	838	8.943	49	26.701	8.027
1929	14.326	98.633	160	837	9.557	65	30.459	5.952
1930	14.585	99.307	157	813	9.883	101	32.451	4.829
1931	14.653	87.667	156	827	10.098	121	32.484	5.007
1932	14.516	83.432	157	857	10.417	118	34.086	5.198
1933	14.386	80.260	160	886	10.322	91	35.573	9.404
1934	14.201	81.176	162	912	11.197	98	40.820	6.422
1935	13.807	82.396	160	883	11.083	98	38.876	8.886
1936	13.353	82.541	155	793	9.008	76	28.820	7.306
1937	13.356	82.985	151	740	8.732	65	29.365	5.832
1938	13.358	83.363	144	768	9.178	83	32.874	7.580
1939	13.261	83.247	139	799	9.574	150	34.201	7.581
1940	13.127	84.733	130	789	9.516	218	32.362	7.889
1941	12.995	84.968	124	840	9.773	163	35.211	8.328
1942	12.895	85.607	113	831	10.424	152	43.417	11.935
1943	12.812	85.810	107	871	11.013	164	46.611	12.741
1944	12.797	86.076	97	853	10.050	164	38.166	10.512
1945	12.836	85.928	88	834	9.766	138	37.225	10.424
1946	12.861	85.860	81	812	9.787	102	36.525	16.094
1947	13.061	87.910	75	816	10.444	93	40.609	29.277
1948	13.016	90.169	69	864	10.873	81	42.533	37.720
1949	13.178	91.256	59	865	10.923	79	42.071	47.237
1950	13.515	82.101	55	841	11.362	90	46.680	118.068
1951	13.902	82.918	53	852	12.188	86	52.681	64.027
1952	14.296	83.587	50	846	12.475	76	54.760	75.121
1953	14.911	83.218	49	830	13.087	101	58.497	82.567
1954	15.213	84.432	47	861	13.411	107	56.324	67.985
1955	15.385	86.450	45	897	14.128	99	67.932	69.642
1956	15.507	87.332	45	957	14.887	140	67.301	90.283
1957	15.746	89.111	44	997	15.724	151	68.504	75.228
1958	15.925	88.388	41	1.000	16.215	115	71.376	59.407
1959	16.180	92.311	41	1.030	16.412	131	72.979	75.302
1960	16.343	92.640	40	1.100	17.151	176	82.652	73.863
1961	16.637	94.479	40	1.218	18.314	174	83.159	79.283
1962	17.079	99.722	39	1.298	18.727	131	80.366	80.071
1963	17.484	99.364	39	1.299	20.165	128	95.053	116.331
1964	17.848	99.771	37	1.258	22.392	137	91.170	93.275
1965	18.287	99.444	35	1.271	24.427	144	108.116	115.183
1966	18.737	99.764	n.a.	1.357	27.370	161	119.681	121.509
1967	19.192	100.581	n.a.	1.427	30.161	183	131.379	116.653
1968	19.504	100.976	n.a.	1.546	32.901	220	164.307	158.264
1969	19.620	100.716	29	1.681	33.634	250	144.527	120.819
1970	19.761	102.957	—	1.781	34.709	278	151.808	92.009
1971	19.545	103.389	—	1.975	34.405	427	170.219	135.137
1972	19.531	103.218	—	2.182	30.919	476	140.649	225.041
1973	19.539	102.711	—	2.330	32.451	344	143.147	251.712
1974	19.493	101.408	n.a.	2.544	34.476	264	172.659	218.859
1975	19.505	99.899	—	2.654	34.771	260	174.807	242.027
1976	18.686	100.053	—	2.464	31.158	242	156.237	291.358
1977	18.723	99.360	—	2.271	29.823	237	143.135	258.034
1978	18.779	99.319	—	2.092	30.265	271	150.284	286.601
1979	18.905	97.074	41	2.065	30.431	293	147.896	348.214
1980	18.958	98.139	39	2.033	30.764	289	160.527	401.030

(a) From 1910 to 1946 at 30 June; for earlier years and from 1947 at 31 December. (b) Comprises allocations by Lands Department and certain leases and licences issued by Mines and Forests Departments. Apparent decrease in 1950 due mainly to revisions in records of Lands Department. (c) At 31 December for 1941 and earlier years; from 1942, the figures shown relate to 31 March in the following year. (d) Comprises shorn, dead and fellmongered wool. Excludes wool exported on skins. For 1947 and earlier, year ended 31 December; figures shown for 1948 to 1964 are for the year ended 31 March in the following year. From 1965 figures relate to the year ended 30 June in the following year. (e) Figures for 1949 and 1951 to 1955 exclude distributions of profits under the 1939-1945 War-time Wool Disposals Plan aggregating \$13.869.934. Separate State figures are not available for distributions made from 1956 to 1958 when payments were virtually complete.

## AGRICULTURE

Area and production of principal grain crops									
Year (a)	Total area used for crops (b)	Wheat				Oats		Barley	
		Production				Area	Production	Area	Production
		Area	Yield per hectare	Total	Gross value				
	'000 hectares	'000 hectares	tonnes	'000 tonnes	\$'000	'000 hectares	'000 tonnes	'000 hectares	'000 tonnes
1840	1	1	1.11	1	—	n.a.	n.a.	n.a.	n.a.
1850	3	2	n.a.	—	—	n.a.	n.a.	n.a.	n.a.
1860	10	6	1.00	6	n.a.	—	—	1	1
1870	22	11	0.79	9	—	1	1	2	2
1880	26	11	0.62	7	—	—	—	2	2
1890	28	14	0.92	13	—	1	1	2	2
1900	81	30	0.70	21	310	2	2	1	1
1910	346	236	0.68	161	2,162	25	14	1	1
1920	730	516	0.65	333	11,023	78	37	4	3
1921	770	541	0.70	378	7,532	66	37	3	2
1922	921	628	0.60	377	6,986	87	41	4	2
1923	940	671	0.77	515	8,987	98	52	4	2
1924	1,097	756	0.86	650	14,532	129	77	5	4
1925	1,187	855	0.65	557	12,837	113	53	5	4
1926	1,346	1,040	0.81	846	17,217	95	49	6	3
1927	1,505	1,214	0.82	990	19,842	95	53	5	3
1928	1,724	1,353	0.68	920	16,473	132	65	6	4
1929	1,848	1,444	0.74	1,064	17,721	156	74	10	6
1930	1,939	1,601	0.91	1,456	12,201	111	60	7	4
1931	1,604	1,278	0.88	1,130	14,430	108	64	6	4
1932	1,725	1,371	0.83	1,137	13,554	116	65	6	3
1933	1,707	1,288	0.79	1,015	12,004	139	72	10	7
1934	1,554	1,119	0.66	734	10,123	166	77	11	5
1935	1,508	1,028	0.62	635	9,747	181	83	13	9
1936	1,559	1,042	0.56	586	11,902	187	63	16	10
1937	1,687	1,225	0.81	986	14,830	156	79	18	13
1938	1,895	1,381	0.73	1,003	8,984	172	85	30	21
1939	1,735	1,202	0.93	1,112	15,526	183	96	34	22
1940	1,614	1,062	0.54	573	8,648	174	59	27	16
1941	1,545	1,073	0.95	1,021	15,615	165	97	28	22
1942	1,127	709	0.79	561	10,080	138	66	20	12
1943	1,110	634	0.71	450	9,531	145	72	25	16
1944	1,115	614	0.71	434	8,319	163	70	31	20
1945	1,163	743	0.77	570	15,871	160	74	27	15
1946	1,429	982	0.66	648	22,048	172	66	27	12
1947	1,593	1,117	0.84	939	50,265	200	98	25	17
1948	1,660	1,161	0.85	987	42,122	215	127	26	22
1949	1,737	1,171	0.89	1,048	51,339	237	132	28	22
1950	1,834	1,289	1.05	1,358	65,328	237	144	24	21
1951	1,824	1,253	0.87	1,089	58,984	266	140	23	16
1952	1,877	1,214	0.80	965	55,194	337	189	43	40
1953	1,812	1,168	0.93	1,030	55,423	297	174	85	62
1954	2,041	1,206	0.77	933	43,655	354	174	105	64
1955	2,118	1,170	1.24	1,449	68,840	442	300	136	106
1956	2,080	1,119	0.78	874	44,055	425	189	139	85
1957	2,230	1,197	0.75	901	45,912	467	250	124	81
1958	2,434	1,332	1.18	1,569	77,639	538	410	130	123
1959	2,583	1,505	1.06	1,597	82,361	502	356	170	161
1960	2,734	1,627	1.07	1,739	92,290	538	396	219	193
1961	2,823	1,773	1.01	1,788	100,023	498	366	199	165
1962	2,965	1,944	1.01	1,973	107,023	476	367	158	137
1963	2,714	1,878	0.76	1,424	74,389	455	324	121	92
1964	2,950	2,085	0.82	1,717	88,557	466	254	123	84
1965	3,419	2,489	1.12	2,780	153,050	502	422	167	147
1966	3,463	2,569	1.09	2,809	153,157	487	401	151	152
1967	3,595	2,690	1.08	2,911	170,102	469	359	168	159
1968	3,840	2,952	1.04	3,060	151,306	442	416	224	208
1969	3,916	2,747	0.66	1,815	90,961	461	281	364	273
1970	3,831	2,361	1.25	2,957	153,227	520	520	632	769
1971	3,751	2,042	1.06	2,165	115,934	454	414	911	1,000
1972	3,855	2,437	0.82	2,003	109,399	297	212	744	640
1973	4,133	2,978	1.41	4,211	461,049	325	383	510	626
1974	3,758	2,810	1.17	3,277	361,211	262	250	387	329
1975	4,207	3,171	1.30	4,122	427,507	320	386	419	505
1976	4,416	3,314	0.98	3,249	290,489	372	347	452	553
1977	4,910	3,609	0.82	2,945	292,863	415	416	614	751
1978	4,993	3,706	1.19	4,400	546,827	427	491	616	778
1979	5,280	4,121	0.91	3,739	571,158	370	399	523	632
1980	5,547	4,333	0.77	3,315	503,921	382	384	535	504

(a) Figures shown for 1942 and earlier are for the year ended last day of February in the following year; those shown for 1943 and later are for the season ended 31 March in the following year. (b) Excludes pasture hay and from 1967 also excludes lucerne.

## PRIMARY PRODUCTION — MISCELLANEOUS

Year	Hay (all kinds) (a)		Gold production (b) (c)		Coal production (c)		Average values f.o.b.	
	Area	Production	Quantity	Value (d)	Quantity	Value	Wool (greasy) per kg (e)	Wheat per tonne (f)
	'000 hectares	'000 tonnes	'000 grams	\$'000	'000 tonnes	\$'000	cents	\$
1860	2	8	—	—	—	—	—	19.83
1870	7	21	—	—	—	—	—	—
1880	8	20	—	—	—	—	n.a.	18.37
1890	9	25	622	171	—	—	—	—
1900	42	106	43.980	12.015	120	110	—	5.51
1910	71	182	45.753	12.494	266	227	16.20	14.85
1920	108	268	19.222	6.951	469	701	28.26	26.33
1921	136	375	17.231	5.907	477	814	24.07	26.94
1922	175	464	16.734	5.052	445	763	22.95	20.21
1923	134	374	15.707	4.464	428	738	33.60	18.53
1924	161	456	15.085	4.512	429	727	41.78	17.45
1925	158	361	13.717	3.749	444	726	45.97	22.35
1926	145	431	13.592	3.715	483	789	30.78	23.04
1927	144	424	12.690	3.469	510	816	28.31	20.29
1928	168	429	12.224	3.342	536	840	35.52	20.05
1929	170	435	11.726	3.204	554	853	29.87	18.60
1930	161	500	13.001	3.729	509	770	19.37	16.69
1931	154	460	15.894	5.996	439	672	14.77	8.42
1932	169	493	18.849	8.807	423	541	15.50	11.48
1933	194	520	19.813	9.773	465	580	15.74	11.18
1934	167	470	20.248	11.118	508	557	28.75	10.79
1935	200	513	20.186	11.404	546	636	17.73	11.79
1936	193	420	26.314	14.747	574	663	24.98	14.62
1937	175	457	31.135	17.488	563	681	29.70	20.29
1938	165	445	36.329	20.726	615	750	24.25	15.08
1939	160	484	37.760	23.686	567	726	19.58	8.95
1940	169	381	37.044	25.393	548	729	25.68	11.19
1941	132	421	34.494	23.703	566	779	28.70	14.49
1942	102	282	26.376	17.731	590	923	28.64	15.12
1943	114	319	16.982	11.421	541	979	32.19	15.09
1944	133	344	14.494	9.800	567	1,166	34.81	17.71
1945	114	292	14.588	10.021	552	1,146	34.24	23.30
1946	112	284	19.191	13.280	652	1,460	34.92	31.81
1947	93	272	21.897	15.151	743	1,680	45.64	48.42
1948	92	281	20.684	14.314	745	1,760	76.41	64.33
1949	87	276	20.155	15.926	763	1,944	94.20	56.11
1950	72	231	18.973	18.933	827	2,575	105.91	57.03
1951	70	215	19.533	19.451	862	3,434	263.50	62.25
1952	92	295	22.706	23.696	843	4,915	138.10	62.64
1953	89	299	25.629	26.598	900	6,146	148.04	63.57
1954	117	310	26.469	26.627	1,034	7,178	156.20	60.90
1955	109	390	26.189	26.749	919	6,179	135.39	52.22
1956	98	293	25.256	26.405	843	5,448	112.66	46.57
1957	137	392	27.900	29.102	852	5,105	144.67	48.12
1958	135	462	26.967	28.357	885	4,561	130.80	56.35
1959	129	440	26.967	28.388	926	4,713	91.87	51.76
1960	115	387	26.625	28.140	937	4,878	115.37	49.48
1961	119	402	27.122	28.584	778	3,361	99.10	49.91
1962	138	460	26.717	28.115	934	3,962	109.80	51.90
1963	117	395	24.883	26.375	916	3,970	111.38	52.30
1964	123	396	22.177	23.383	1,003	4,679	134.47	52.01
1965	118	421	20.497	22.381	1,010	4,410	120.58	51.66
1966	119	424	19.564	23.316	1,078	4,562	116.00	51.12
1967	129	428	17.916	21.690	1,079	4,765	117.46	54.88
1968	138	508	15.925	19.407	1,104	4,817	105.69	51.31
1969	202	576	14.961	19.040	1,120	4,853	107.60	51.26
1970	190	673	12.310	15.811	1,178	5,407	98.11	47.72
1971	177	653	10.736	13.674	1,190	5,653	75.33	48.88
1972	224	664	10.848	14.835	1,188	5,855	74.94	49.52
1973	220	734	9.264	16.718	1,154	6,422	150.21	49.67
1974	164	508	7.173	19.183	1,197	7,237	215.36	98.75
1975	163	536	6.305	29.788	1,879	12,511	144.37	126.39
1976	169	560	7.644	27.141	2,157	17,613	147.62	116.89
1977	191	597	7.619	31.586	2,339	21,896	188.10	105.10
1978	184	586	13.653	64.741	2,435	24,846	195.76	(g) 92.52
1979	208	636	12.231	78.313	2,406	34,484	207.87	(g) 116.53
1980	240	703	11.598	158.253	3,039	54,464	(g) 253.81	(g) 146.45

(a) See footnote (a) on preceding page. (b) Prior to 1971 comprises gold refined at the Mint and gold contained in gold-bearing materials exported. From 1971 covers gold production as notified by the Department of Mines. (c) From 1969 figures relate to year ended 30 June. (d) Includes amounts distributed by the Gold Producers' Association Ltd. from premiums on sales of Western Australian gold and net subsidy payments by the Commonwealth Government, under the *Gold Mining Industry Assistance Act* 1954. (e) From 1920 figures relate to year ended 30 June. (f) Prior to 1940 averages generally are based on exports of the previous season's wheat; from 1940 they relate to exports during the year ended 30 June. (g) Overseas exports only.

**VALUE OF PRIMARY COMMODITIES PRODUCED**  
(Excluding Mining)  
(\$'000)

Gross value of primary commodities produced (excluding mining) (b)

Year (a)	Agri- culture	Dairying, poultry farming and bee keeping	Pastoral (c)	Hunting	Forestry	Fisheries (d)	Total (d)
1920	17,466	2,065	(e) 9,008				
1921	13,853	2,265	(e) 8,032			n.a.	
1922	12,992	2,350	(e) 10,584				n.a.
1923	15,076	2,483	(e) 13,027		n.a.	642	
1924	22,367	2,726	(e) 13,419			764	
1925	19,510	2,507	(e) 11,537		4,126	970	38,651
1926	24,187	2,503	(e) 11,262		3,367	580	41,899
1927	26,068	2,687	(e) 14,687		2,906	516	46,865
1928	23,884	2,936	(e) 13,501		2,463	561	43,344
1929	24,504	3,443	(e) 10,800		2,159	544	41,450
1930	17,756	3,170	(e) 8,845		1,809	485	32,066
1931	20,985	3,311	(e) 8,023		1,312	427	34,058
1932	20,495	3,338	(e) 8,057		1,183	430	33,502
1933	19,022	3,315	(e) 13,369		1,648	406	37,759
1934	16,336	3,927	9,329	127	2,399	373	32,491
1935	17,045	3,897	12,439	200	2,653	372	36,606
1936	18,871	4,170	11,016	421	3,032	465	37,974
1937	21,071	4,494	9,947	193	2,957	592	39,254
1938	17,077	4,716	9,326	131	2,899	561	34,711
1939	23,198	4,855	11,463	139	2,660	562	42,877
1940	14,760	5,230	11,460	241	3,160	539	35,391
1941	22,219	5,960	11,958	276	2,950	479	43,843
1942	18,106	7,664	16,155	190	3,277	255	45,647
1943	18,505	7,971	18,156	225	3,150	347	48,353
1944	20,856	8,473	15,385	215	3,152	330	48,411
1945	26,310	8,709	15,948	281	3,358	438	55,044
1946	32,635	8,933	21,986	465	3,305	635	67,959
1947	64,699	9,790	37,036	395	3,649	1,135	116,703
1948	58,785	11,964	46,254	517	4,024	1,379	122,924
1949	69,686	12,975	58,687	393	4,501	1,432	147,674
1950	87,752	14,155	131,921	499	6,741	1,649	242,716
1951	86,791	18,778	79,955	488	8,517	2,505	197,034
1952	87,127	21,289	90,639	461	7,155	3,286	209,956
1953	86,533	22,328	101,567	609	7,678	3,808	222,523
1954	77,164	21,762	87,435	335	8,116	4,383	199,195
1955	109,709	22,433	89,293	361	10,474	4,915	237,185
1956	80,170	23,240	112,885	277	10,305	5,563	232,441
1957	87,293	23,500	94,118	175	11,046	6,530	222,662
1958	126,672	22,838	81,639	125	10,903	7,818	249,995
1959	131,052	24,696	100,255	288	10,919	8,621	275,831
1960	140,003	25,917	101,051	579	11,082	8,569	287,201
1961	148,765	26,400	105,310	511	11,104	10,689	302,779
1962	157,948	27,387	107,280	376	10,877	11,219	315,087
1963	123,342	28,723	148,701	632	11,462	10,187	323,047
1964	139,426	30,884	125,837	775	12,093	15,218	324,233
1965	215,949	32,899	157,249	836	12,731	15,733	435,397
1966	218,206	33,022	159,857	986	13,300	16,525	441,895
1967	234,020	35,485	158,754	1,236	14,076	21,954	465,524
1968	218,854	38,801	210,780	1,211	13,465	23,717	506,828
1969	153,805	40,459	176,387	1,098	13,632	19,660	405,041
1970	256,862	42,330	146,198	834	16,174	25,127	487,525
1971	216,969	45,170	199,443	838	14,660	30,817	507,896
1972	203,417	50,137	321,111	2,132	14,607	28,158	619,561
1973	604,907	59,648	369,636	1,739	15,264	30,494	1,081,687
1974		(f) 845,169		1,657	19,995	35,130	901,951
1975		996,633		1,744	23,404	51,079	1,071,861
1976		959,160		2,622	26,349	69,094	1,057,226
1977		993,964		2,675	28,016	88,340	1,112,994
1978		1,339,823		4,842	27,612	96,055	1,468,333
1979		1,572,145		3,704	34,473	85,652	1,695,974

(a) Figures generally are for the season or financial period ending in the following year. (b) Estimated value of recorded production based on wholesale prices realised at the principal market. (c) In addition the following amounts were paid as interim distribution of profits under the 1939-1945 War-time Wool Disposals Plan: in 1949, \$3,629,478; in 1951, \$3,629,478; in 1952, \$2,325,324; in 1953, \$368,104; in 1954, \$2,120,460; and in 1955, \$1,797,090. Separate State figures are not available for distributions made from 1956 to 1958 when payments were virtually complete. (d) Figures for 1979 exclude pearling and whaling. (e) Separate details not available. (f) From 1974 this dissection has been contracted to the single industry 'Agriculture'.



## FACTORIES (a)

Year (b)	Factories (c)	Persons employed (c)	Wages and salaries (d)	Output (e)	Net production (f)	Production of selected commodities						Timber from local logs (l)
						Bricks (g)	Scoured wool (h)	Bacon and ham (i)	Butter (j)	Flour (plain)	Cheese (k)	
	No.	No.	\$'000	\$'000	\$'000	'000	tonnes	tonnes	tonnes	tonnes	tonnes	'000 cu m
1900	632	11,166	2,589	n.a.	n.a.	25,234	—	n.a.	132	11,375	—	266
1910	822	14,894	3,532	10,158	5,472	23,162	—	n.a.	291	33,401	—	412
1920	998	16,942	6,073	26,283	9,708	31,838	n.a.	850	553	108,976	n.a.	325
1930	1,466	19,643	8,310	33,783	14,976	47,720	—	1,180	2,143	109,402	—	377
1931	1,455	14,619	5,774	24,707	10,562	13,630	—	1,321	3,222	119,830	—	265
1932	1,490	13,392	4,671	22,375	9,212	15,101	—	1,318	3,787	118,991	—	136
1933	1,499	14,810	5,083	24,655	10,124	25,673	—	1,567	4,292	115,733	—	140
1934	1,606	16,154	5,505	25,755	10,889	31,717	1,324	1,932	4,456	110,677	—	228
1935	1,658	17,769	6,222	29,283	12,570	37,552	1,633	2,068	5,072	112,609	129	308
1936	1,946	20,972	7,408	35,057	15,008	50,498	1,533	2,411	4,975	107,356	391	366
1937	2,032	22,712	8,315	36,626	15,893	53,270	1,129	1,972	4,827	111,332	458	416
1938	2,066	23,133	8,803	39,288	17,125	57,598	1,358	1,976	6,215	113,826	400	417
1939	2,129	23,211	9,147	39,097	17,551	53,062	1,673	1,911	6,647	124,786	443	381
1940	2,129	22,967	9,150	40,615	18,055	43,786	2,459	2,106	6,351	127,776	382	360
1941	2,056	22,734	9,441	43,650	18,034	45,505	3,867	2,325	6,454	136,010	431	347
1942	1,938	23,980	10,999	47,904	20,201	34,247	2,709	2,773	7,103	122,777	589	345
1943	1,799	25,813	12,956	53,475	22,906	8,926	3,455	4,172	6,549	114,554	735	328
1944	1,807	28,101	14,835	58,417	25,023	6,296	4,437	4,391	6,254	144,967	804	287
1945	1,931	29,146	15,228	63,481	25,920	10,003	4,274	5,051	5,767	146,683	835	275
1946	2,280	30,256	15,668	68,046	27,653	24,150	3,899	4,646	5,694	151,310	824	278
1947	2,615	33,806	18,210	76,340	31,497	37,758	5,417	4,677	6,052	160,323	1,033	330
1948	2,788	35,967	21,471	91,252	36,768	44,986	5,334	4,018	7,086	177,352	1,035	351
1949	2,925	38,354	25,856	106,831	42,948	50,378	6,467	3,610	7,078	164,623	884	336
1950	3,023	40,733	30,586	127,956	52,088	58,943	7,110	3,599	6,878	144,691	712	363
1951	3,111	43,761	39,316	168,862	68,441	67,312	5,828	3,615	6,906	197,172	760	416
1952	3,267	45,097	50,769	213,143	85,491	76,884	5,884	3,739	6,813	201,255	634	471
1953	3,424	45,188	56,687	238,620	98,383	86,043	6,162	3,752	6,584	203,509	909	527
1954	3,523	47,459	63,181	269,174	110,294	101,240	6,914	3,503	6,241	170,513	1,224	569
1955	3,727	49,314	69,476	299,169	121,912	115,412	7,226	3,369	7,260	150,381	1,100	593
1956	3,871	50,108	74,413	350,293	139,466	102,359	9,483	3,283	7,523	162,715	775	578
1957	3,935	48,748	73,833	375,272	146,884	101,209	11,044	3,103	7,582	153,800	1,201	539
1958	3,941	48,462	75,870	392,525	150,624	111,082	11,708	2,999	6,916	134,398	1,033	550
1959	4,125	48,417	77,464	392,405	157,524	101,521	12,791	3,002	6,265	126,736	1,200	561
1960	4,279	49,651	83,285	431,165	172,747	110,359	15,271	3,228	7,494	136,780	1,466	532
1961	4,334	50,666	90,255	481,140	193,262	119,998	13,420	3,214	7,784	152,622	1,373	496
1962	4,418	51,033	92,840	486,988	196,083	119,868	14,459	3,556	7,603	128,007	1,386	505
1963	4,492	53,435	99,880	517,899	216,422	131,176	13,312	3,899	7,075	123,296	1,462	486
1964	4,609	55,705	108,515	555,058	230,511	155,792	12,464	3,841	7,026	129,996	1,530	517
1965	4,734	58,097	119,978	616,422	260,637	146,057	12,040	4,047	7,887	121,906	1,838	550
1966	4,906	60,282	134,171	678,751	288,803	140,611	12,107	4,357	8,225	103,115	1,230	552
1967	5,167	63,575	153,597	765,224	335,788	163,166	12,148	4,654	6,529	91,725	1,726	533
1968	5,404	67,335	175,100	887,372	388,257	207,575	12,662	5,173	6,009	100,418	1,983	557
1969	5,585	69,853	183,168	919,555	361,473	273,078	14,415	5,591	6,332	96,641	2,022	444
1970	5,705	72,597	208,410	1,028,778	414,999	288,949	14,940	5,399	5,915	92,635	1,718	450
1971	(m)	(m)	(m)	(m)	(m)	240,323	10,724	4,863	5,425	96,411	1,917	449
1972	2,727	64,217	255,879	1,240,106	472,013	227,581	17,009	5,116	5,988	84,227	1,979	407
1973	2,814	64,074	275,455	1,375,859	501,034	278,610	11,987	5,257	5,324	77,680	1,869	405
1974	2,818	67,884	346,942	1,741,029	658,412	304,178	10,791	5,530	5,223	79,114	1,922	408
1975	1,974	65,852	434,272	2,032,374	779,842	262,905	11,779	5,294	4,981	84,486	2,291	392
1976	2,054	65,953	508,931	2,432,654	944,459	328,356	13,969	5,439	4,531	78,447	2,673	388
1977	2,035	66,750	594,514	2,882,421	1,151,619	385,942	15,818	5,836	3,340	n.a.	2,074	375
1978	2,037	65,740	629,095	3,031,505	1,208,749	357,391	13,308	5,666	2,212	n.a.	1,812	386
1979	2,202	65,232	670,772	3,498,828	1,321,683	381,092	16,129	5,516	1,373	n.a.	2,364	341
1980	2,300	65,964	733,955	4,256,522	1,642,761	404,954	20,128	5,930	995	n.a.	2,864	349

(a) Prior to 1968-69 a factory was defined for statistical purposes as any establishment engaged in the processes of manufacturing, assembling, treating or repairing and in which four or more persons were employed during any period of the year, or power other than manual was used. For 1968-69 and later, direct comparisons of statistics of number of factories, persons employed, wages and salaries, output and net production with those for earlier years are not possible (see introduction to Chapter VIII). Figures for 1974-75 and later, exclude details of single establishment enterprises with less than four persons (see Section *Manufacturing Statistics*). (b) From 1930 year ended 30 June. (c) Average over whole year including working proprietors. Prior to 1926-27 includes fallers and haulers employed by sawmills. (d) Figures for 1929-30 and later exclude amounts drawn by working proprietors. (e) Selling value 'at the factory'. (f) Value added in course of manufacture, representing sum available for payment of wages, rent, depreciation, other sundry expenses and for interest and profit. (g) For years prior to 1964-65, figures include all types of standard size bricks. Prior to 1929-30, they also include firebricks and blocks. From 1964-65 figures represent clay bricks only (all sizes). (h) Excludes fellmongered, dead or waste wool. (i) From 1977-78 excludes canned bacon and ham. (j) For 1917 and earlier years, include butter made on farms. Source: from 1978, Western Australian Department of Agriculture. (k) Source: 1933-34 to 1967-68, annual manufacturing census; 1968-69 to 1970-71, Commonwealth Dairy Produce Equalisation Committee Limited; from 1971-72, Western Australian Department of Agriculture. (l) Prior to 1968-69, figures also include hewn timber. (m) A census of manufacturing establishments was not conducted in respect of the year ended 30 June 1971.

## INDUSTRIAL DISPUTES; WAGE RATES; UNEMPLOYMENT BENEFIT

Year	Industrial disputes (a)				State basic wage per week (b)		Minimum wage rate index numbers (c)		Unemployment benefit (d)	
	Number of disputes	Workers involved (e)	Working days lost (man-days)		Perth (f)		Adult males (g)		Persons on benefit (h)	
			Number	Average per worker involved	Adult males	Adult females	Weekly	Hourly		
1920	45	'000 12.0	'000 166.6	No. 13.87	\$	\$				
1921	12	12.1	145.1	12.03						
1922	8	0.8	43.5	53.94	(i)	(i)				
1923	6	4.0	72.3	18.04						
1924	13	3.5	66.7	19.08						
1925	10	4.1	98.9	23.93						
1926	9	0.6	9.1	15.11	8.50	4.59				
1927	20	3.4	23.8	7.02	8.50	4.59				
1928	11	2.5	54.9	21.72	8.50	4.59				
1929	4	0.9	2.7	3.05	8.70	4.70	n.a.	n.a.		
1930	2	0.5	27.1	57.85	8.60	4.64				
1931	13	3.9	24.0	6.12	7.35	3.97				
1932	8	2.7	11.1	4.16	7.05	3.81				n.a.
1933	10	3.9	16.9	4.31	6.92	3.74				
1934	10	3.5	17.8	5.11	7.10	3.83				
1935	11	3.6	72.0	19.98	7.05	3.81				
1936	19	4.7	32.4	6.87	7.38	3.98				
1937	12	1.7	14.4	8.65	7.49	4.04				
1938	7	3.6	43.8	12.01	8.11	4.38				
1939	7	1.3	14.1	11.25	8.22	4.43	35.6	32.0		
1940	4	3.0	7.4	2.44	8.53	4.61	36.8	33.1		
1941	3	0.3	0.8	2.79	9.04	4.88	39.0	35.4		
1942	8	1.8	8.9	4.89	9.78	5.28	41.5	37.6		
1943	10	2.5	38.4	15.11	10.11	5.46	42.8	38.8		
1944	30	11.0	90.0	8.16	9.99	5.39	42.6	38.6		
1945	16	3.8	32.5	8.55	10.01	5.41	42.6	38.7		
1946	11	6.4	69.6	10.94	10.21	5.51	43.6	39.5		422
1947	7	1.8	6.1	3.44	11.08	5.98	48.4	44.1		1,095
1948	9	2.4	7.8	3.33	12.16	6.57	53.9	53.9		409
1949	16	5.7	26.3	4.64	13.59	7.34	59.6	59.7		126
1950	15	2.0	5.7	2.93	16.65	9.41	71.0	71.7		267
1951	10	4.2	5.1	1.22	20.57	13.37	85.5	85.7		60
1952	21	19.2	127.8	6.67	23.85	15.50	97.5	97.7		57
1953	11	3.7	5.0	1.36	24.65	16.02	100.4	100.7		844
1954	15	5.5	21.7	3.94	24.65	16.02	101.7	101.9		427
1955	16	9.8	9.6	0.97	25.24	16.41	106.3	106.6		157
1956	14	11.1	31.9	2.87	26.52	17.23	110.8	111.0		473
1957	14	5.4	3.1	0.57	27.28	17.72	113.9	114.1		1,940
1958	20	11.0	3.0	0.27	27.34	17.78	114.7	114.9		2,330
1959	20	11.2	11.2	1.00	28.15	18.30	120.7	120.8		2,852
1960	43	25.7	27.3	1.06	29.46	22.09	126.8	127.1		2,512
1961	22	9.7	23.2	2.40	29.88	22.41	128.8	129.0		2,154
1962	28	8.4	6.3	0.75	29.88	22.41	129.5	129.7		2,932
1963	28	42.6	32.0	0.75	30.15	22.61	132.8	133.0		2,674
1964	26	6.2	7.1	1.16	31.12	23.34	137.5	137.6		2,677
1965	33	12.6	10.0	0.79	31.96	23.97	143.4	143.5		1,679
1966	25	2.9	6.2	2.17	33.50	25.13	153.6	153.8		785
1967	26	5.1	6.0	1.18	(j)	(j)	159.6	159.9		718
1968	70	18.7	21.8	1.16	35.45	27.08	169.0	168.7		608
1969	104	59.1	101.4	1.72	36.45	27.88	179.5	179.3		524
1970	125	46.5	141.1	3.03	38.45	29.40	198.2	198.0		474
1971	132	35.8	69.4	1.94	39.45	30.90	219.5	219.4		872
1972	105	28.3	94.6	3.34	40.45	32.40	234.2	232.5		2,808
1973	160	37.6	117.3	3.12	44.00	39.00	267.9	266.3		4,960
1974	257	188.1	256.9	1.37	48.50	43.50	357.7	356.5		2,863
1975	236	53.8	100.7	1.87	48.50	43.50	401.2	398.5		9,317
1976	250	100.7	252.1	2.50	48.50	43.50	468.4	466.0		13,598
1977	229	54.9	220.5	4.02	48.50	43.50	526.0	524.2		15,706
1978	306	76.1	197.9	2.60	48.50	43.50	560.1	558.2		20,470
1979	252	r 169.5	348.1	2.06	48.50	43.50	r 585.5	r 583.6	(k) 29,000	
1980	368	69.4	191.0	2.8	48.50	43.50	p 651.6	p 649.6	(k) 29,800	

(a) Excludes disputes involving cessation of work of less than 10 man-days. Details of the number of disputes and workers involved in disputes which commenced in any year and were still in progress during the following year are included in the figures for both years. (b) At 31 December. (c) End of December. Base: weighted average wage rate for Australia, 1954 = 100. (d) Payment commenced 1 July 1945. (e) Includes workers indirectly involved, i.e. those thrown out of work at an establishment where a stoppage occurred but not themselves parties to the dispute. (f) The rates shown for 1964 and later apply uniformly throughout the State. (g) Excludes workers in rural industry. (h) Year ended 30 June: average number of persons on benefit at end of each week. (i) The first State basic wage operated from the beginning of the first pay-period commencing on or after 1 July 1926. (j) Special loading of 60 cents a week added to award rates for adult males and adult females operative from the beginning of the first pay-period commencing on or after 1 July 1967. Loading increased to \$1.95 operative from the beginning of the first pay-period commencing on or after 25 October 1968 until 22 November 1968 when loading was absorbed in basic wage. (k) Estimated.

## CONSUMER PRICE INDEX (a)

Year ended 30 June	Group index numbers — Perth										Weighted average of six State capital cities	
	Food	Clothing	Housing	Household supplies and equipment	Miscellaneous	Household equipment and operation	Transportation	Tobacco and alcohol	Health and personal care	Recreation	All groups	All groups
1949	38.4	50.6	36.1	60.4	45.4						44.0	43.9
1950	42.6	58.3	38.2	64.6	46.6						48.0	47.6
1951	48.8	66.7	42.9	71.0	50.4						53.9	53.8
1952	60.8	80.8	50.2	84.2	60.8						65.6	65.9
1953	69.7	84.8	57.6	90.9	67.1						72.5	72.1
1954	74.0	84.8	62.0	92.7	66.8						74.6	73.5
1955	76.1	84.9	68.6	92.8	66.8						76.3	74.0
1956	77.4	86.0	71.3	92.7	70.8						78.3	77.0
1957	80.9	87.4	71.1	95.0	78.5						81.8	81.5
1958	79.7	89.6	72.5	96.0	79.4						82.4	82.3
1959	80.3	90.8	75.0	96.3	79.6						83.2	83.6
1960	82.5	91.7	76.9	97.3	81.1						84.8	85.7
1961	86.7	93.9	81.6	97.6	84.0	n.a.	n.a.	n.a.	n.a.		87.9	89.2
1962	86.1	94.7	84.3	97.6	84.0					n.a.	88.2	89.6
1963	86.4	95.0	86.9	97.3	84.2						88.7	89.8
1964	87.4	95.7	89.8	95.7	86.2						89.8	90.6
1965	91.0	96.8	92.1	96.7	90.0						92.6	94.0
1966	95.2	97.9	95.4	98.3	95.3						96.1	97.4
1967	100.0	100.0	100.0	100.0	100.0						100.0	100.0
1968	102.9	102.1	105.8	100.7	103.2						102.9	103.3
1969	104.5	104.5	112.7	102.1	105.6						105.5	106.0
1970	108.1	107.8	120.1	103.7	109.8						109.4	109.4
1971	112.5	112.3	125.7	107.7	114.8						114.1	114.6
1972	116.4	118.9	133.7	112.7	124.5						120.7	122.4
1973	124.5	126.1	139.7	117.4	130.4						127.3	129.8
1974	141.7	143.3	149.1	125.7	141.6						140.6	146.6
1975	160.9	174.2	174.2			154.5	158.2	167.6	188.2		166.1	171.1
1976	180.2	202.3	209.7			184.1	184.9	206.4	156.6		189.6	193.3
1977	205.5	232.9	244.5			198.9	206.2	226.3	308.1	104.3	219.4	220.0
1978	235.6	258.6	269.4	n.a.	n.a.	217.8	224.8	237.6	365.7	113.5	243.1	241.0
1979	260.2	277.0	282.3			233.4	249.4	277.2	337.0	120.8	262.8	260.7
1980	290.7	295.9	r 292.8			251.6	278.7	299.7	385.5	r 131.2	287.4	r 287.2
1981	317.1	318.4	316.6			281.4	307.6	317.5	398.7	143.6	312.7	314.2

(a) With the exception of *Health and personal care* (Base: December quarter 1968 = 100) and *Recreation* (Base: September quarter 1976 = 100), the base of each index is Year 1966-67 = 100.

## BUILDING COMPLETED

Year ended 30 June	Houses (a) (b)		Other dwellings (a) (c)		Alterations and additions (d) to dwellings	Other building (e)			Total all building (e)	
	Number	Value (e)	Number	Value (e)	Value (e)	Factories	Offices	Education	Total	
		\$'000		\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
1946	860	1,452	2	4	—	144	—	—	492	1,948
1947	1,792	3,516	—	—	—	98	—	—	716	4,232
1948	2,771	5,784	—	—	—	176	—	—	872	6,656
1949	3,244	7,592	—	—	—	440	—	—	1,822	9,414
1950	3,509	8,974	101	194	—	446	—	—	1,822	10,704
							n.a.	n.a.		
1951	5,160	15,032	305	606	—	410	—	—	2,258	17,896
1952	6,577	24,466	215	300	—	1,402	—	—	4,086	28,852
1953	7,965	37,988	100	334	—	1,668	—	—	7,514	45,836
1954	7,627	39,768	212	834	—	1,734	—	—	10,968	51,570
1955	8,792	48,422	316	1,176	—	6,250	—	—	18,594	68,192
1956	7,760	45,084	584	2,564	—	3,756	842	2,162	19,708	67,356
1957	5,030	29,054	365	1,502	(f)	2,210	2,002	1,162	16,292	46,848
1958	6,196	36,526	171	712	—	2,526	3,906	1,110	17,286	54,524
1959	5,846	34,410	212	840	—	2,792	2,384	4,584	25,274	60,524
1960	5,997	35,454	263	986	—	2,368	1,544	5,838	23,800	60,240
1961	5,973	38,102	440	1,580	—	4,736	4,118	7,956	32,368	72,050
1962	6,082	39,470	265	1,342	—	3,038	2,902	6,014	27,260	68,072
1963	6,593	45,780	642	2,984	—	4,912	1,588	7,724	37,664	86,428
1964	7,276	51,774	1,295	5,596	—	5,384	5,996	6,226	35,498	92,868
1965	7,445	57,238	1,841	9,046	—	6,816	2,820	8,044	40,816	107,100
1966	7,265	58,089	1,624	9,096	—	9,631	10,576	8,459	62,993	130,178
1967	8,272	78,078	1,742	9,322	—	9,841	7,093	10,477	74,735	162,135
1968	9,858	97,370	2,392	12,577	—	15,061	14,608	12,051	85,456	195,403
1969	12,840	133,276	3,491	22,406	—	15,845	10,885	14,122	99,152	254,833
1970	13,933	151,300	5,596	40,519	—	16,615	14,294	13,297	111,577	303,397
1971	11,900	149,267	5,013	39,964	404	18,006	39,736	20,589	175,377	365,012
1972	13,209	165,548	1,595	13,913	1,187	21,336	19,360	16,325	150,790	331,440
1973	13,660	163,396	920	7,308	1,842	15,594	21,245	24,767	151,468	324,013
1974	12,517	176,410	3,546	32,828	2,763	23,430	19,034	21,846	139,163	351,164
1975	10,994	198,605	3,300	38,882	4,427	18,216	18,443	39,965	170,105	412,020
1976	12,080	253,756	2,948	43,989	8,714	22,387	45,695	58,285	227,299	533,757
1977	15,155	394,991	6,152	113,875	15,405	26,640	43,533	29,497	226,433	750,706
1978	12,685	378,760	4,681	98,949	21,496	34,611	18,166	46,109	234,046	733,251
1979	11,148	349,145	3,507	74,864	30,512	43,997	33,250	56,349	339,272	793,794
1980	11,648	380,933	4,156	93,236	33,317	51,514	49,865	33,232	301,934	809,421

(a) Prior to 1970-71 figures include alterations and additions to dwellings. Data for 1970-71 and later years relate to new dwellings only.

(b) From July 1973 dwellings have been classified as *Houses* and *Other dwellings*, replacing the previous categories *Houses* and *Flats*. The separate classifications are not comparable, but the sum of *Houses* and *Other dwellings* and the sum of *Houses* and *Flats* are comparable.

(c) Individual living units: prior to 1 July 1973 described as *Flats*. (d) Valued at \$10,000 and over. (e) Excludes the value of land. (f) Not available separately; included with *Houses* and *Other dwellings* as appropriate.

## WESTERN AUSTRALIA IN RELATION TO AUSTRALIA

Particulars	Unit	Date or period	Western Australia	Australia	Percentage
Area	sq km	..	2,525,500	7,682,300	32.9
Proportion of areas having rainfall —					
Under 250 mm	per cent	..	58.0	39.0	..
250 mm and under 500 mm	per cent	..	29.2	31.8	..
500 mm and over	per cent	..	12.8	29.2	..
Population	number	1980 p	1,276,676	14,726,763	8.7
Population increase	number	1980 p	23,076	210,284	11.0
Rate of population increase	per cent	1980 p	1.8	1.4	..
Births registered	number	1980	20,607	225,527	9.1
Deaths registered	number	1980	8,166	108,693	7.5
Marriages registered	number	1980	9,594	109,240	8.8
Divorce — Dissolutions granted	number	1980	3,073	39,258	7.8
Employed labour force (a)	'000	Oct 1981	564.4	6,406.5	8.8
Average weekly earnings per employed male unit	\$	1980-81	279.10	281.30	..
Unemployed on benefit	number	June 1981	29,274	(b) 314,500	(c) 9.3
Industrial disputes — Working days lost	'000	1980	191.0	3,320.2	5.8
Trade union membership	'000	1980	234.7	2,943.9	8.0
Area under crop	'000 hectares	1979-80	5,280	17,958	29.4
Area under sown pasture	'000 hectares	1979-80	7,133	26,511	26.9
Area of —					
Wheat for grain	'000 hectares	1979-80	4,121	11,153	36.9
Oats for grain	'000 hectares	1979-80	370	1,123	32.9
Barley for grain	'000 hectares	1979-80	523	2,482	21.1
Hay	'000 hectares	1979-80	208	1,036	20.0
Fruit and vineyards	'000 hectares	1979-80	9	172	5.4
Livestock —					
Sheep	'000	1979-80	30,431	135,985	22.4
Cattle	'000	1979-80	2,065	26,303	7.9
Pigs	'000	1979-80	293	2,518	11.6
Wool production (d)	tonne	1979-80	158,184	713,354	22.2
Meat production (e)	'000 tonnes	1979-80	211	2,332	9.1
Whole milk production	mil. litres	1979-80	216	5,473	4.0
Butter production	million kg	1979-80	(f) 1.0	84.3	1.2
Fish (live weight)	tonne	1979-80	10,915	56,994	19.2
Crustaceans (live weight)	tonne	1979-80	14,226	37,371	38.1
Value of agricultural commodities produced	\$m	1979-80	1,572	11,768	13.4
Mining establishments — Value added (g)	\$m	1979-80	(h) 1,165.3	5,608.6	20.8
Gold production	'000 grams	1979-80	(i) 11,598	18,273	63.5
Iron ore production	'000 tonnes	1979-80	92,103	96,998	95.0
Bauxite production	'000 tonnes	1979-80	(j) 13,309	27,629	48.2
Black coal production	'000 tonnes	1979-80	(j) 3,039	81,249	3.7
Crude oil production	'000 cu m	1979-80	(i) 1,504	23,647	6.4
Manufacturing establishments (j) —					
Number (g)	'000	1979-80	2,300	27,430	8.4
Employment — Average over whole year (g)	'000	1979-80	66.0	1,154.2	5.7
Wages and salaries paid (g)	\$m	1979-80	734.0	13,351.0	5.5
Value added (g)	\$m	1979-80	1,642.8	25,596.0	6.4
Total new dwellings commenced	number	1979-80	15,693	133,855	11.7
Value of all building commenced	\$m	1979-80	811.9	7,973.1	10.2
Overseas imports	\$m f.o.b.	1979-80	1,449.7	16,216.4	8.9
Overseas exports	\$m f.o.b.	1979-80	3,854.1	18,887.2	20.4
Overseas cargo discharged	'000 tonnes	1979-80	6,304.6	22,933.3	27.5
	'000 cu m	1979-80	465.1	8,095.1	5.7
Overseas cargo loaded	'000 tonnes	1979-80	98,502.4	186,876.8	52.7
	'000 cu m	1979-80	122.2	1,803.8	6.8
Motor vehicles on register	'000	June 1980	745.0	7,573.6	9.8
New motor vehicles registered	'000	1980-81	63.0	665.0	9.5
Road traffic accidents — Persons killed	number	1980	293	3,272	9.0
Retail sales (excluding motor vehicles, etc.)	\$m	June qr 1981	764.8	(k) 8,416.2	(l) 9.1
Instalment credit for retail sales — Balances outstanding	\$m	June 1981	332.5	3,169.9	— 10.5
Savings bank deposits per head	\$	June 1981	1,053	1,363	..
Household income per head	\$	1979-80	6,341	6,675	..
Age and invalid pensions	number	June 1980	98,887	1,321,926	7.5
Disability and service pensions	number	June 1980	56,988	674,731	8.4
Student enrolment —					
Government schools	number	July 1980	206,634	2,318,077	8.9
Non-government schools	number	July 1980	46,595	656,485	7.1
Universities	number	April 1980	12,276	163,156	7.5
Colleges of Advanced Education	number	April 1980	19,826	159,476	12.4

(a) The estimates relate to all persons aged 15 years and over, except members of the permanent defence forces, certain diplomatic personnel of overseas governments, overseas visitors holidaying in Australia and members of non-Australian defence forces in Australia. (b) Estimated. (c) See footnote (b). (d) In terms of greasy wool. Comprises shorn wool, felledmongered wool and wool exported on skins. (e) Dressed carcass weight. Excludes offal. (f) Source: Department of Agriculture, from October 1978. (g) See definitions at the beginning of Chapter VIII. (h) Excludes establishments predominantly engaged in quarrying sand and gravel. (i) As reported to Department of Mines. (j) See Chapter VIII, Part 3. Excludes electricity and gas establishments. (k) Excludes details of Australian Capital Territory and Northern Territory. (l) See footnote (k).

## APPENDIX

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## APPENDIX

## CHAPTER III — CONSTITUTION AND GOVERNMENT

page 126

**The State Parliament**

A redesignation and reallocation of portfolios in the Ministry occurred on 25 January 1982. From that date the Ministry was constituted as shown in the following table.

## THE MINISTRY FROM 25 JANUARY 1982

Name of Minister	Title of Office
Hon. Raymond James O'Connor, M.L.A.	Premier, Treasurer and Minister Co-ordinating Economic and Regional Development
Hon. Edgar Cyril Rushton, M.L.A.	Deputy Premier, Minister for Transport, and Emergency Services
Hon. Richard Charles Old, M.L.A.	Minister for Primary Industry, Agriculture, and Fisheries and Wildlife
Hon. Ian George Medcalf, E.D., Q.C., M.L.C.	Attorney-General, Minister for Federal Affairs, and Leader of the Government in the Legislative Council
Hon. Andrew Mensaros, M.L.A.	Minister for Works, Water Resources, and Education, and Minister Assisting the Minister Co-ordinating Economic and Regional Development
Hon. Peter Vernon Jones, M.L.A.	Minister for Resources Development, Mines, and Fuel and Energy
Hon. Raymond Laurence Young, F.C.A., M.L.A.	Minister for Health, Community Welfare, Housing, and Consumer Affairs
Hon. William Ralph Boucher Hassell, LL.B., M.A., M.L.A.	Minister for Police and Prisons, and Minister Assisting the Minister for Emergency Services
Hon. Gordon Edgar Masters, M.L.C.	Minister for Labour and Industry, and Immigration
Hon. Margaret June Craig, M.L.A.	Minister for Local Government, and Urban Development and Town Planning
Hon. Ian James Laurance, B.A., M.L.A.	Minister for Lands, Forests, and Conservation and the Environment
Hon. Barry John MacKinnon, B.Ec., A.A.S.A., M.L.A.	Minister for Industrial Development and Commerce, Regional Administration and the North West, and Tourism
Hon. Robert Gerald Pike, M.L.C.	Chief Secretary, Minister for Cultural Affairs, and Recreation
Hon. James George Clarko, A.E., B.A., Dip. Ed., M.A.C.E., J.P., M.L.A.	Honorary Minister Assisting the Minister in the Portfolio of Education
Hon. Richard Steele Shalders, M.L.A.	Honorary Minister Assisting the Minister in the Portfolios of Community Welfare, Housing, and Consumer Affairs
Hon. Thomas Knight, A.F.A.I.M., A.A.I.B., M.L.C.	Parliamentary Secretary to the Cabinet

## CHAPTER V — SOCIAL CONDITIONS

### PART 5 — HOUSING AND BUILDING

pages 264-7

#### CONSTRUCTION INDUSTRY SURVEY

The following tables are selected from the results of a survey of private and public sector construction activity conducted in respect of the year 1978-79. This is the first time that the Australian Bureau of Statistics has collected comprehensive information on the structure of the construction industry. The collection was conducted as a component of the Australian Bureau of Statistics' integrated economic statistics system. For details of this system, its standard concepts, definitions of units and standard data items, see the beginning of Chapter VIII.

More detailed tables, a description of the survey methodology and definitions of data items, construction terms and industry classes appear in the publications *Private Sector Construction Establishments — Details of Operations by Industry Class, Western Australia: 1978-79* (Catalogue No. 8719.0) and *Construction Activity in the Public Sector, Australia: 1978-79* (Catalogue No. 8712.0), published by the Australian Statistician, Canberra.

#### PRIVATE SECTOR CONSTRUCTION ESTABLISHMENTS SUMMARY OF OPERATIONS BY INDUSTRY CLASS: 1978-79

Industry class	Number of establishments operating at 30 June	Average employment over whole year	Wages and salaries	Turnover	Value added
		Persons	\$'000	\$'000	\$'000
General construction establishments —					
Building construction —					
House construction	954	3,478	22,523	319,533	67,378
Residential building construction, n.e.c.	207	481	1,747	35,850	6,837
Non-residential building construction	293	3,333	37,907	287,921	61,136
Total	1,454	7,292	62,177	643,304	135,351
Non-building construction —					
Road and bridge construction	83	1,175	13,704	70,799	23,981
Non-building construction, n.e.c.	154	2,845	41,960	208,825	70,321
Total	237	4,020	55,664	279,625	94,302
Total, General construction establishments	1,691	11,312	117,841	922,929	229,653
Special trade construction establishments —					
Concreting	198	820	4,976	28,260	10,190
Bricklaying	453	1,051	3,007	14,199	8,616
Roof tiling	35	142	758	9,690	3,031
Floor and wall tiling	139	324	630	5,238	2,724
Structural steel erection	46	291	2,927	8,391	5,152
Plumbing	441	2,034	13,571	61,728	25,506
Electrical work	414	2,727	26,949	81,170	40,071
Heating and airconditioning	69	771	7,997	37,433	11,870
Plastering and plaster fixing	257	774	2,527	16,627	7,201
Carpentry	305	767	2,850	12,779	6,961
Painting	479	1,540	8,320	29,310	17,047
Earthmoving and dredging	162	1,168	11,611	48,237	21,742
Special trades, n.e.c.	360	1,441	8,895	47,525	18,891
Total, Special trade construction establishments	3,360	13,850	95,018	400,585	179,001
TOTAL CONSTRUCTION ESTABLISHMENTS	5,052	25,162	212,859	1,323,514	408,654



**PRIVATE SECTOR CONSTRUCTION ESTABLISHMENTS  
VALUE OF CONSTRUCTION WORK DONE BY TYPE OF  
CONSTRUCTION BY COMMODITY: 1978-79  
(\$'000)**

Commodity	Trade contracting		General construction			Capital work done for own use, rental, or lease (a)
	Prime contract	Sub-contract	Prime contract	Sub-contract	Speculative construction	
<b>Building —</b>						
Houses —						
New	6,145	77,287	254,663	1,209	20,823	803
Alterations, additions and improvements	9,374	7,115	29,642	827	—	369
Repairs and maintenance	20,366	2,865	6,890	80	—	20
Other residential buildings —						
New	637	10,274	35,303	45	13,250	1,885
Alterations, additions and improvements	689	1,471	2,603	—	—	—
Repairs and maintenance	3,312	362	708	—	—	—
Non-residential buildings —						
New work, alterations, additions and improvements to —						
Commercial buildings	7,867	42,775	98,546	3,217	510	1,811
Industrial buildings	7,747	30,759	67,266	718	63	639
Other buildings	6,622	26,635	92,814	463	—	79
Repairs and maintenance	13,713	1,678	7,002	100	—	—
<b>Total, Building</b>	<b>76,470</b>	<b>201,219</b>	<b>595,437</b>	<b>6,658</b>	<b>34,645</b>	<b>5,605</b>
<b>Non-building construction —</b>						
New work, alterations and additions to —						
Roads, highways and related structures	8,559	12,272	42,575	12,308	535	—
Bridges	463	88	5,550	368	—	—
Railways and tramways	812	42	5,731	56	—	—
Harbours	1,715	355	6,807	34	—	—
Dams, water supply pipelines	2,905	2,089	16,494	118	—	—
Electric power transmission lines	1,061	524	6,572	—	—	—
Electric power distribution lines	322	1,134	—	—	37	—
Water distribution systems	2,113	193	1,008	3	70	—
Sewer systems	2,824	5,549	12,110	908	144	—
Pipelines, n.e.c.	377	218	3,199	1,188	—	—
Street and highway lighting	231	—	—	—	—	—
Heavy electrical generating plant and equipment	180	2,001	16,088	713	—	—
Heavy industrial plant and equipment, n.e.c.	8,671	12,009	38,876	11,761	—	—
Telecommunications towers, lines and structures	39	54	72	45	—	—
Other	28,915	4,718	29,668	2,948	—	—
Repairs and maintenance to —						
Roads, highways and related structures	854	99	2,958	3,245	—	—
Bridges	2	3	393	151	—	—
Other	7,166	463	36,012	9,287	—	—
<b>Total, Non-building construction</b>	<b>67,211</b>	<b>41,810</b>	<b>224,115</b>	<b>43,131</b>	<b>786</b>	<b>—</b>
<b>Demolition</b>	<b>412</b>	<b>57</b>	<b>5</b>	<b>—</b>	<b>—</b>	<b>—</b>
<b>TOTAL, CONSTRUCTION WORK DONE</b>	<b>144,093</b>	<b>243,086</b>	<b>819,558</b>	<b>49,790</b>	<b>35,431</b>	<b>5,606</b>

(a) Only current account expenses associated with this work are included.

**STATE AND LOCAL GOVERNMENT ENTERPRISES AND CONSTRUCTION EMPLOYMENT  
1978-79**

Level of government	Number of enterprises	Construction employment						Total employment
		On-site			Other			
		Male	Female	Total	Male	Female	Total	
State Government	9	3,759	22	3,781	573	—	573	4,354
Local government —								
Municipal government	100	2,262	1	2,263	251	1	252	2,515
Other (semi-government)	2	3	—	3	—	—	—	3
Total, State and local government	111	6,024	23	6,047	824	1	825	6,872

**STATE AND LOCAL GOVERNMENT ENTERPRISES  
CONSTRUCTION EXPENDITURE: 1978-79  
(\$'000)**

Level of government	Project involving own employees			Projects not involving own employees	Total selected construction expenses		
	Selected expenses				Payments to contractors	Building	Non-building
	Wages and salaries	Internal plant hire	Other direct expenses				
State Government	49.145	12.969	110.196	154.791	62.221	264.880	327.101
Local government —							
Municipal government	19.048	7.353	17.772	14.854	13.229	45.797	59.026
Other (semi-government)	112	—	227	3.959	7	4.292	4.299
Total, State and local government	68.305	20.322	128.195	173.604	75.457	314.969	390.426

**CHAPTER IX — TRADE, TRANSPORT AND COMMUNICATION  
PART 2 — INTERNAL TRADE**

pages 449-50

**Census of Retail and Selected Services Establishments**

The following two tables contain statistics compiled from the Census of Retail and Selected Service Establishments conducted in respect of the year ended 30 June 1980. More detailed information can be found in a series of separate publications with the following catalogue numbers: 8622.5, 8623.5, 8624.5, 8625.5, 8626.5 and 8605.5.

**RETAIL ESTABLISHMENTS AND SELECTED SERVICE ESTABLISHMENTS (a)  
DETAILS OF OPERATIONS BY INDUSTRY CLASS: 1979-80**

ASIC class description	Establishments at 30 June	Persons employed at 30 June (b)	Wages and salaries (c)	Retail sales	Turnover	Stocks at 30 June	Total floor space
	No.	No.	\$'000	\$'000	\$'000	\$'000	sq metres
Retail establishments —							
Department and general stores —							
Department stores	39	8,025	55,665	311,247	330,740	54,769	318,048
General stores	43	549	4,427	31,725	35,887	5,549	37,553
Total, Department and general stores	82	8,574	60,092	342,972	366,627	60,318	355,601
Clothing, fabrics and furniture stores —							
Men's and boys' wear stores	191	839	5,724	45,944	46,710	10,189	31,059
Women's and girls' wear stores	567	2,301	12,997	99,419	99,758	19,010	72,731
Footwear stores	199	1,205	7,306	49,061	49,130	11,142	33,773
Shoe repairers	28	64	438	34	1,380	78	649
Fabrics and household textile stores	154	852	4,477	31,826	32,183	7,366	29,787
Floor coverings stores	92	487	3,809	45,205	46,663	7,798	43,293
Furniture stores	156	718	5,290	53,933	54,777	8,863	81,294
Total, Clothing, fabrics and furniture stores	1,387	6,466	40,041	325,421	330,602	64,445	292,586
Household appliance and hardware stores —							
Domestic hardware stores	102	303	1,208	10,296	12,043	2,784	13,156
Watchmakers and jewellers	179	899	5,562	36,553	40,084	8,991	13,584
Music stores	115	328	1,831	21,563	22,133	4,112	11,911
Household appliance stores	259	1,423	12,450	146,757	158,483	20,814	80,683
Electric appliance repairers n.e.c.	74	406	2,515	1,490	9,538	767	11,979
Total, Household appliance and hardware stores	729	3,359	23,566	216,659	242,281	37,467	131,313

**RETAIL ESTABLISHMENTS AND SELECTED SERVICE ESTABLISHMENTS (a)**  
**DETAILS OF OPERATIONS BY INDUSTRY CLASS: 1979-80 — continued**

ASIC class description	Establish- ments at 30 June	Persons employed at 30 June (b)	Wages and salaries (c)	Retail sales	Turnover	Stocks at 30 June	Total floor space
	No.	No.	\$'000	\$'000	\$'000	\$'000	sq metres
Motor vehicle dealers: petrol and tyre retailers —							
New motor vehicle dealers	800	7,532	64,931	591,147	980,052	118,331	..
Used motor vehicle dealers	260	1,131	8,858	133,030	154,908	17,145	..
Service stations (d)	771	3,821	19,009	270,706	309,673	11,340	..
Smash repairers	313	1,894	13,796	398	49,191	1,174	..
Motor cycle dealers	68	276	1,653	18,633	22,007	4,102	..
Boat and caravan dealers	98	507	3,209	38,809	44,528	8,644	..
Tyre and battery retailers	172	801	6,665	53,838	58,713	6,670	..
Total, Motor vehicle dealers: petrol and tyre retailers	2,482	15,962	118,121	1,106,561	1,619,073	167,406	..
Food stores —							
Grocers, confectioners and tobacconists	1,311	15,761	73,701	868,748	885,730	70,390	529,202
Butchers	538	1,728	9,128	95,560	96,742	1,165	55,357
Fruit and vegetable stores	226	932	2,414	31,695	31,833	735	23,653
Liquor stores	198	826	4,335	89,324	90,025	7,746	43,669
Bread and cake stores	80	414	1,908	9,413	9,696	232	9,351
Fish shops: take-away food and milk bars	811	4,928	14,715	97,008	103,183	2,675	84,189
Total, Food stores	3,164	24,589	106,201	1,191,747	1,217,209	82,944	745,421
Other retailers —							
Pharmacies	416	2,108	13,066	88,511	92,960	14,383	52,272
Photographic equipment stores	48	176	1,320	9,459	11,486	1,856	4,024
Sports and toy stores	215	676	2,867	30,330	32,339	7,795	35,163
Newsagents, stationers and booksellers	481	1,744	6,072	74,895	78,155	10,073	53,043
Second hand goods dealers	134	301	1,039	11,017	11,220	2,253	20,727
Nurserymen and florists (e)	132	602	2,320	17,327	17,791	1,762	26,720
Retailing n.e.c.	124	349	1,408	10,395	11,553	2,078	13,152
Total, Other retailers	1,550	5,956	28,092	241,935	255,505	40,201	205,101
TOTAL, RETAIL ESTABLISHMENTS	9,394	64,906	376,112	3,425,294	4,031,296	452,781	1,730,022
Selected service establishments —							
Motion picture theatres	97	951	4,404	3,396	18,976	158	..
Restaurants, hotels and accommodation —							
Cafes and restaurants	490	5,243	31,108	15,312	100,416	2,367	..
Hotels, etc. (mainly drinking places)	556	8,029	48,927	208,616	250,353	10,245	..
Accommodation	417	3,805	22,799	9,326	74,120	1,027	..
Total, Restaurants, hotels and accommodation	1,463	17,077	102,834	233,253	424,889	13,639	..
Licensed clubs —							
Licensed bowling clubs	87	408	3,033	10,991	12,314	799	..
Licensed golf clubs	40	360	2,671	4,240	8,280	298	..
Licensed clubs n.e.c.	156	1,237	8,131	29,023	37,737	1,857	..
Total, Licensed clubs	283	2,005	13,835	44,253	58,331	2,954	..
Laundries and dry-cleaners	109	942	6,516	86	16,763	322	..
Hairdressers, beauty salons —							
Men's hairdressers	25	103	497	114	1,332	21	..
Women's hairdressing and beauty salons	200	1,220	7,663	1,289	16,531	566	..
Total, Hairdressers, beauty salons	225	1,323	8,160	1,403	17,863	587	..
TOTAL, SELECTED SERVICE ESTABLISHMENTS	2,177	22,298	135,749	282,391	536,822	17,661	..
TOTAL, RETAIL AND SELECTED SERVICE ESTABLISHMENTS	11,571	87,204	511,861	3,707,685	4,568,118	470,442	..

(a) Excludes (except for ASIC classes 9232 and 9233) all single establishment retail and selected service enterprises with turnover of less than \$50,000 and all bread and milk vendors. (b) Includes working proprietors. (c) Excludes drawings by working proprietors. (d) The retail sales and turnover figures for this industry do not reflect sales of petrol on commission. (e) The definition of floor space could not be strictly applied for nurseries (ASIC class 4896) and therefore the figures should be used as a guide only. In general, the floor space for nurseries includes both inside and outside selling areas but the treatment of outside growing areas may vary.

**RETAIL ESTABLISHMENTS (a) — NUMBER OF ESTABLISHMENTS AND THE  
VALUE OF RETAIL SALES BY COMMODITY ITEM: 1979-80**

Commodity item	Establish- ments at 30 June (b)	Retail sales		
		Value	Commodity items to total retail sales	Value per head of population (c)
	No.	\$'000	%	\$
Groceries and confectionery	3,164	576,969	16.8	456.1
Fresh meat	957	167,008	4.9	132.0
Fresh fruit and vegetables	1,193	76,018	2.2	60.1
Bread, cakes and pastries	1,617	43,693	1.3	34.5
Ready-to-eat take-away food, including fresh seafoods	1,430	83,330	2.4	65.9
Ice cream, soft drinks, milk drinks — for immediate consumption	2,285	30,750	0.9	24.3
Beer, wine and spirits	339	110,246	3.2	87.2
Cigarettes and other tobacco products	3,105	75,267	2.2	59.5
Furniture, mattresses, awnings, blinds, etc.	413	82,734	2.4	65.4
Floor coverings, carpets, linoleum, floor tiles, etc.	250	50,986	1.5	40.3
Fabrics, piece goods, drapery, manchester, blankets, soft furnishings, etc.	595	71,666	2.1	56.6
Clothing and accessories — men's and boys'	800	101,430	3.0	80.2
Clothing and accessories — women's, girls' and infants'	1,153	176,599	5.2	139.6
Footwear	731	61,150	1.8	48.3
Radios, radiograms, record players, tape recorders, television sets and accessories	447	63,447	1.9	50.2
Musical instruments, records, sheet music, etc.	380	26,547	0.8	21.0
Domestic refrigerators, freezers, washing machines, stoves, clothes dryers, dishwashers, air conditioners and evaporative coolers	301	63,344	1.8	50.1
Other household appliances and accessories	445	38,088	1.1	30.1
Kitchenware, china, glassware and garden equipment	1,030	57,320	1.7	45.3
Petrol, oils and motor lubricants, etc.	1,276	256,805	7.5	203.0
New motor vehicles including trucks and commercial vehicles	258	373,220	10.9	295.0
New parts and accessories for motor vehicles	1,073	88,997	2.6	70.4
Used motor vehicles including trucks and commercial vehicles	451	253,267	7.4	200.2
Used parts and accessories for motor vehicles	167	9,921	0.3	7.8
New and used motor cycles, motor scooters, parts and accessories	138	23,379	0.7	18.5
New and used tyres, tubes and batteries for motor vehicles and motor cycles	991	59,803	1.7	47.3
New and used boats, outboard motors, car, box and boat trailers	102	20,156	0.6	15.9
New and used caravans	41	17,919	0.5	14.2
Cosmetics, perfumes, toilet preparations, etc.	1,036	50,119	1.5	39.6
Prescription and patent medicines and therapeutic appliances	631	54,149	1.6	42.8
Photographic equipment and supplies	564	16,858	0.5	13.3
Watches, clocks, jewellery, silverware	745	43,644	1.3	34.5
Sporting goods and requisites, camping equipment, bicycles, toys, etc.	889	56,636	1.7	44.8
Books, stationery, newspapers, periodicals, devotional and religious goods, artists' requisites	1,528	90,872	2.7	71.8
Antiques, disposal goods, unredeemed pledges and other secondhand goods	166	11,474	0.3	9.1
Cut flowers, garden seeds, shrubs, trees and other nursery stock	286	17,952	0.5	14.2
Goods not included above	593	23,530	0.7	18.6
<b>TOTAL RETAIL SALES</b>	..	3,425,294	100.0	2,707.7

(a) Excludes all bread and milk vendors and single establishment retail enterprises with turnover of less than \$50,000. (b) Many establishments showed takings in more than one commodity item. Accordingly the sum of the number of establishments showing sales for individual items will exceed the total number of retail establishments. (c) Population at 30 June 1980.

## ARTICLES PUBLISHED IN PREVIOUS ISSUES (a)

In cases where an article has been published in more than one previous issue, the reference to its last appearance only is given.

Article	Year Book
Agriculture, Institute of, University of Western Australia	1975, pp. 217-18
Air pollution and the weather	1975, pp. 63-5
Albany, Port of	1971, pp. 449-51
ANZAAS Congress: Perth, 1973	1973, pp. 562-4
Basic wage, historical summary —	
Commonwealth	1968, pp. 396-401
State	1968, pp. 403-5
Captain Fremantle's Report of Arrival of First Settlers, text of	1976, pp. 541-2
Captain Stirling's 'Narrative of Operations', text of	1974, pp. 533-41
Census of Wholesale Establishments, 1968-69	1976, pp. 434-7
Censuses of population and housing, 1911 to 1966	1972, pp. 547-70
Community Welfare, Department for, history of	1981, pp. 135-9
Computer Service Centre, Perth	1969, p. 504
Conservation of the fauna	1976, pp. 93-5
Conservation of the flora	1975, pp. 78-80
Cyclones, tropical	1969, pp. 43-50
Education Department, history of	1972, pp. 117-21
Electoral Divisions (Commonwealth)	1971, pp. 97-8
Electoral Divisions (Commonwealth), origin of names of	1970, p. 530
Electoral Provinces and Electoral Districts (State)	1976, pp. 116-17
Esperance, Port of	1973, pp. 444-6
Exploration in Western Australia	1975, pp. 9-28
Export price index	1970, p. 507
Flora of Western Australia —	
Acacia	1965, pp. 59-60
'Christmas tree' ( <i>Nuytsia floribunda</i> )	1962, p. 51
Economic value of the flora	1968, pp. 54-5
Grasses	1976, pp. 69-72
Orchids	1968, pp. 48-9
Proteaceae family in Western Australia	1974, pp. 52-4
Rutaceae family in Western Australia	1972, pp. 53-5
Special features of the flora	1962, pp. 51-2
Forests Department, history of	1976, pp. 125-7
Fremantle, Port of	1970, pp. 441-3
Geraldton, Port of	1972, pp. 447-9
Government administration, Commonwealth	1973, p. 542
Governor Darling's letter to the Earl of Bathurst, text of	1974, pp. 541-2
Governor Stirling's Commission dated 4 March 1831, text of	1979, pp. 12-16
Historical review — chronological notes from 1829	1967, pp. 2-33
Historical survey of Western Australia	1973, pp. 1-15
Hydrocarbon Exploration on the North-West Shelf	1976, pp. 37-9
Industrial Development, Department of	1974, p. 403
Integrated Economic Censuses, 1968-69	1971, pp. 552-64
Kuri Bay pearls	1974, pp. 558-9
Labour Force Survey	1971, pp. 508-10
Land settlement schemes, government	1976, pp. 328-9
Land tenure system, origin and development of	1960, pp. 198-9
Lands and Surveys Department, history of	1980, pp. 128-31
Linseed, area and production	1973, pp. 349-50
Local government in Western Australia, development of	1971, pp. 565-70

ARTICLES PUBLISHED IN PREVIOUS ISSUES (a) — *continued*

Article	Year Book
McNess Housing Trust .....	1969, p. 205
Major Lockyer's letter to Colonial Secretary MacLeay, text of .....	1977, pp. 553-6
Meteorites, Western Australian .....	1973, pp. 34-5
Meteorological services —	
History of .....	1960, pp. 34-5
Provision of .....	1966, pp. 46-7
Metric conversion for Australia .....	1972, pp. 571-4
Mines, Department of, history of .....	1977, pp. 117-25
Overseas arrivals and departures .....	1971, pp. 145-6
Parliamentary procedure and administrative machinery .....	1970, pp. 106-9
Perth's underground water .....	1980, pp. 43-5
Pest control without insecticides .....	1973, pp. 93-5
Pesticides, effect on beneficial forms of life .....	1969, pp. 90-1
Pesticides, use of in Western Australia .....	1971, pp. 87-90
Poisonous plants of Western Australia .....	1970, pp. 56-9
Police Department, history of .....	1973, pp. 113-16
Population in local government areas .....	1972, pp. 542-3
Port Hedland, Port of .....	1974, pp. 435-8
Premier's Department, history of .....	1974, pp. 109-13
Principal events of 1970 .....	1971, p. 571
Public Works Department, history of .....	1971, pp. 116-19
Pyrites, production of .....	1973, pp. 393-4
Railways —	
Origin and development .....	1968, pp. 360-1
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Timber .....	1968, pp. 363-4
Rainfall in agricultural areas, 1969 .....	1970, p. 529
Rents (weekly) of unfurnished houses and flats .....	1973, p. 216
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Settlement at King George's Sound, early history of .....	1977, pp. 556-9
Sporting organisations .....	1970, pp. 196-200
State Basic Wage .....	1976, pp. 485-7
State Government Departments, functions of .....	1972, pp. 108-16
Third Party Claims Tribunal .....	1973, p. 254
Tornadoes .....	1970, pp. 48-51
Tourism, Department of, history of .....	1975, pp. 132-6
Trade, constitutional provisions and legislation .....	1973, p. 412
Trade, historical summary of .....	1967, pp. 346-7
Trade, overseas, encouragement of .....	1973, pp. 412-13
University — principal benefactions .....	1969, p. 173
Use of pesticides in Western Australia .....	1971, pp. 87-90
West Australian Economy, 1959 to 1973 .....	1973, pp. 565-71
Wheat, development of production .....	1968, p. 270

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## MAPS PUBLISHED IN PREVIOUS ISSUES (a)

Map	Year Book
Air routes at 31 December 1956	1957, p. 289
Air routes at 30 June 1969	1970, <i>between</i> p. 448 and p. 449
Areas of current development	1970, <i>facing</i> p. 336
Electoral Divisions (Commonwealth)	1971, <i>between</i> p. 96 and p. 97
Electoral Provinces and Electoral Districts (State)	1969, <i>between</i> p. 96 and p. 97
Electricity supplies	1967, <i>facing</i> p. 320
Epicentres of large earthquakes	1971, p. 33
General map of the State showing statistical divisions, local government areas, roads, railways, air routes and isohyets	1973, <i>inside back cover</i>
General map of the State showing physical features, roads, railways and airfields	1975, <i>inside back cover</i>
Perth Statistical Division	1968, <i>facing</i> p. 112
Port of Fremantle (Outer and Inner Harbour)	1970, <i>facing</i> p. 448
Port of Port Hedland	1974, p. 437
Production, main areas of	1957, p. 73
Railways and road services — routes operated	1967, <i>facing</i> p. 384
Railways road services — routes operated	1964, p. 354
Rainfall	1969, <i>facing</i> p. 32
Rainfall in agricultural areas, 1969	1970, p. 529
Roads, main and important secondary	1968, <i>facing</i> p. 368
Vegetation Provinces of Western Australia	1974, p. 56

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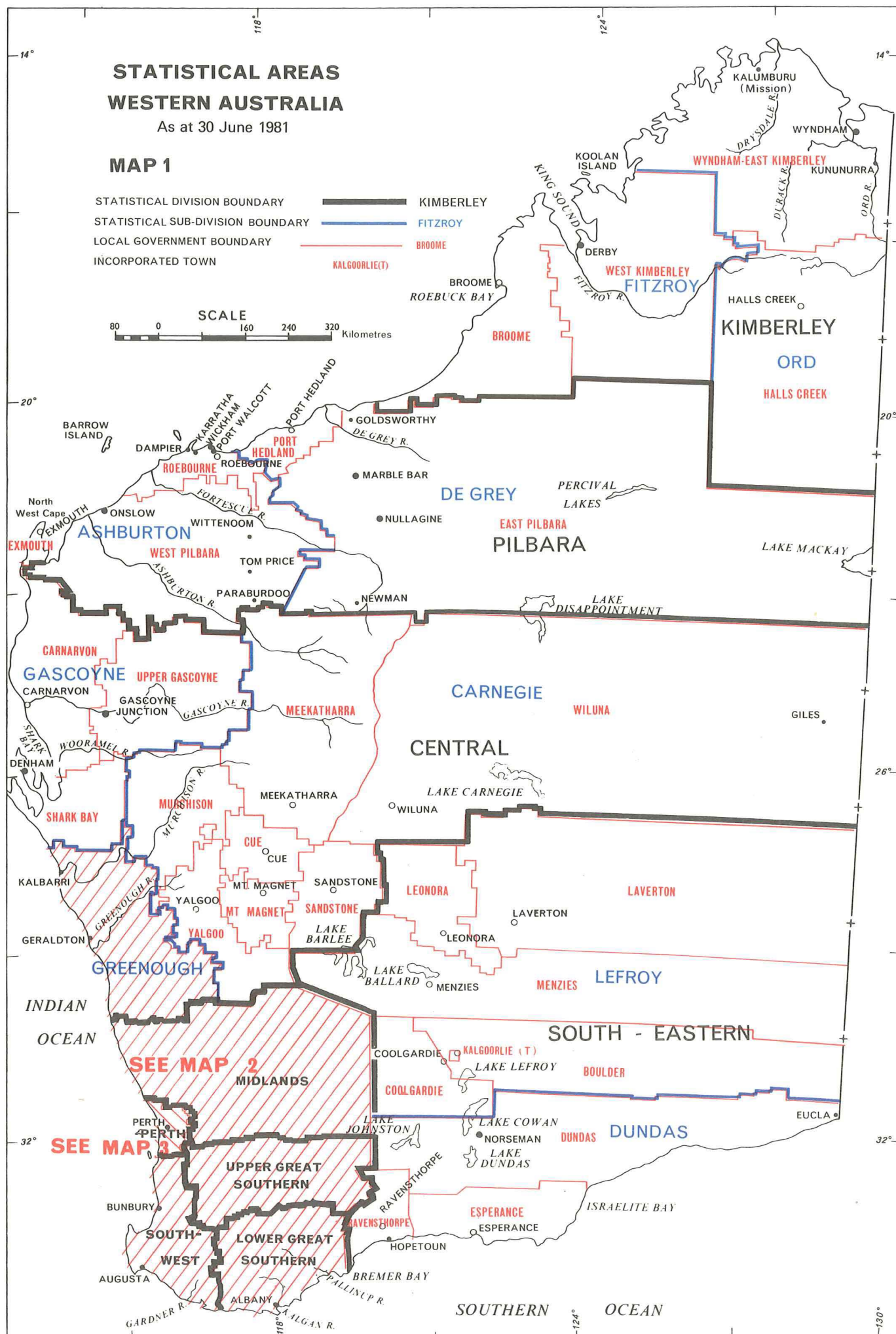
# STATISTICAL AREAS WESTERN AUSTRALIA

As at 30 June 1981

MAP 1

STATISTICAL DIVISION BOUNDARY ————  
STATISTICAL SUB-DIVISION BOUNDARY ————  
LOCAL GOVERNMENT BOUNDARY ————  
INCORPORATED TOWN ●

SCALE  
80 0 160 240 320 Kilometres



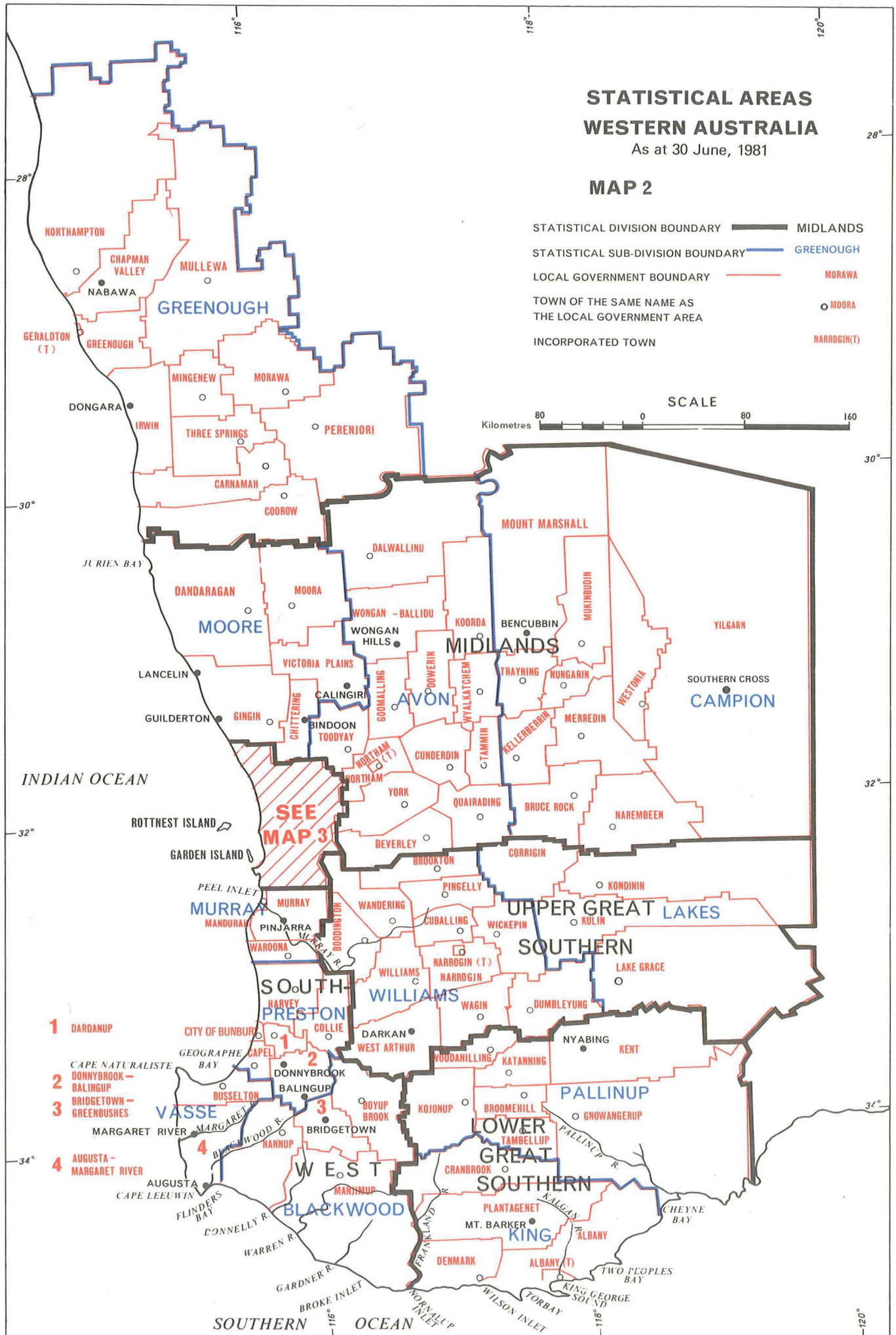


# STATISTICAL AREAS WESTERN AUSTRALIA As at 30 June, 1981

MAP 2

STATISTICAL DIVISION BOUNDARY ——— MIDLANDS  
STATISTICAL SUB-DIVISION BOUNDARY ——— GREENOUGH  
LOCAL GOVERNMENT BOUNDARY ——— MORAWA  
TOWN OF THE SAME NAME AS  
THE LOCAL GOVERNMENT AREA ○ MOORA  
INCORPORATED TOWN ○ NARROGIN(T)

SCALE  
Kilometres 80 0 80 160





As at 30 June, 1981

STATISTICAL DIVISION BOUNDARY ——— PERTH

STATISTICAL SUB-DIVISION BOUNDARY ——— EAST METROPOLITAN

LOCAL GOVERNMENT BOUNDARY ——— SWAN



