CHAPTER XXVII.

DEFENCE.

§ 1. Military Defence.

1. **State Systems.**—A detailed historical account of the Australian defence forces prior to Federation will be found in Official Year Book No. 2, pp. 1075–1080. See also Official Year Book No. 12, p. 999.

The strength of the military forces of the States on 31st December, 1900 (the eve of Federation) was :—New South Wales, 9,338 ; Victoria, 6,335 ; Queensland, 4,028 ; South Australia, 2,932 ; Western Australia, 2,696 ; Tasmania, 2,024 ; total for Australia, 27,353. This total was exclusive of cadets, reservists and rifle club members.

2. **Commonwealth System.**—(i) *General.* Under the terms of the Constitution Act 1900, the Commonwealth took over control of defence matters in March, 1901. The growth of the Commonwealth Military Forces may be considered to have taken place in fifteen phases, namely :—

(*a*) The first phase, i.e., the welding together of the military forces of the States into one homogeneous army, was entrusted by the Government in 1902 to Major-General Sir Edward Hutton, K.C.B., K.C.M.G., and a sound foundation was laid, upon which the subsequent organization and training were based.

(*b*) The second phase was the introduction of Universal Training in 1911. During 1909 a measure providing for universal training was enacted, and the scheme came into force in 1911 after the advice and recommendations of Lord Kitchener had been obtained. By the Defence Acts of 1903 and 1904 all male inhabitants between the ages of 18 and 60 years were made liable to serve in Australia with the defence forces *in time of war.* Subsequent legislation made training and service compulsory up to the age of 26 years *in time of peace.* By the Act of 1909 the principle of universal liability to training was made law for the first time in any English-speaking community. More detailed reference to these matters will be found in Official Year Book No. 12, p. 999 *et seq.*

(*c*) The third phase, Divisional Organization, came into operation from 1st May, 1921. Under this system a war organization, evolved from the Australian Imperial Force, was applied to peace conditions, with a minimum of permanent personnel. Numbers of units and formations were altered to correspond with those of the A.I.F. and every effort was made to maintain the traditions established by those units in the 1914–19 War.

(*d*) The fourth phase, which was initiated by the Government in 1922, entailed the reduction of the Divisional Organization to a nucleus force.

(*e*) The fifth phase, the suspension of all compulsory obligations *in time of peace* (under Part XII. of the Defence Act) and the reconstitution of the forces on a basis of voluntary enlistment, was brought into operation as from 1st November, 1929. The Divisional Organization was retained, but the peace nucleus was reduced from 48,000 Citizen Forces and 16,000 Senior Cadets to 35,000 Militia Forces and 7,000 Senior Cadets, by reductions in the training establishments of units and by ceasing to maintain certain light horse regiments and infantry battalions. The peace nucleus of the Militia Forces was further reduced to 30,000 in 1931.

(*f*) The sixth phase was initiated by the Government in July, 1936, whereby authority was given to raise the training strength of the Militia to 35,000, maintaining the Senior Cadets at 7,000. This strength was attained by December, 1936. The Divisional Organization was retained. Certain light horse regiments and infantry battalions which ceased to be maintained in the fifth phase, and were linked with other light horse regiments and battalions, were now resuscitated. In addition certain new units were organized as a first step towards the modernization of the field army and coast defence. These units included light horse machine gun regiments and anti-aircraft and searchlight units.

(*g*) The seventh phase was initiated by the Government in November, 1938, when authority was given to raise the training strength of the militia to 70,000. This strength was attained in March, 1939. The Divisional Organization was retained, and in order to absorb the increasing numbers the policy of increasing unit establishments was adopted, but new units were formed in a few special cases only.

(*h*) The eighth phase was initiated by the Government on 2nd September, 1939, when the Governor-General issued a proclamation of the existence of war or of a danger thereof and for the calling out of the Citizen Forces for war service.

(*i*) The ninth phase was initiated by the Government on 13th October, 1939, when the organization of the Australian Military Forces into Commands came into operation.

The objects of the Command Organization are as follows :—

(*a*) to bring peace organization into line with war organization ;

(*b*) to provide for the personal and whole-time guidance and supervision, by a higher commander, of divisional and other formation commanders, on questions of training and general preparedness for war ;

(*c*) to reduce the number of lower formations under the direct control of Army Head-quarters.

(*j*) The tenth phase was initiated by the Government on 30th November, 1939, when a proclamation was issued under the Defence Act calling upon certain personnel to enlist and serve in the Defence Forces.

(*k*) The eleventh phase : Owing to a considerable expansion in the administrative functions which the three main commands were called upon to perform, it was decided to relieve the G.Os.C. of these commands and their staffs of much of their administrative responsibilities in order that they might concentrate on operational matters. In January, 1942, therefore, Northern,

Eastern and Southern Commands were divided into separate command and base head-quarters—the command head-quarters to handle operational and base head-quarters administrative matters.

(*l*) The twelfth phase : As a result of the expansion in supply and other administrative installations in Australia, it was found necessary to revise the machinery for command administration of lines of communication areas and to decentralize control. A division into lines of communication areas was therefore made, and these areas corresponded with Northern, Eastern, Southern and Western Commands and 7th and 8th Military Districts. Command and general administrative control of the lines of communication areas were placed under the respective base head-quarters and 7th and 8th Military Districts and came directly under Army Head-quarters.

(*m*) The thirteenth phase : In August, 1941, War Cabinet approved of Lieutenant-General Sir Iven Mackay as G.O.C.-in-C. Home Forces commanding the forces in Northern, Eastern and Southern Commands. The G.O.C.-in-C. was made superior to the G.Os.C. Commands for the direction of operations, but subordinate to the Military Board, which remained the body advising the Minister for the Army, and through him, War Cabinet.

(*n*) The fourteenth phase : Shortly after the outbreak of war with Japan, a number of units of the United States Forces were routed to Australia. Subsequently additional forces arrived. By agreement among the Governments of the United States, the United Kingdom, the Netherlands and Australia in April, 1942, General Douglas MacArthur was appointed Commander-in-Chief, South West Pacific Area. General Sir Thomas Blamey was assigned to the command of the Allied Land Forces in the South West Pacific Area by General Head-quarters, South West Pacific Area. With the appointment of General Sir Thomas Blamey as Commander-in-Chief Australian Military Forces, the Military Board ceased to function and Army Head-quarters became Allied Land Forces Head-quarters, Australia. As from 9th April, 1942, the system of commands and bases was abolished and replaced by the field army and lines of communication areas which were established in each of the six States on the mainland plus Northern Territory and New Guinea. Field formations were formed as follows :—

First Australian Army	..	From Northern and Eastern Commands.
Second Australian Army	..	From Southern Command.
III. Australian Corps	..	From Western Command.
Northern Territory Force	..	From 7th Military District.
New Guinea Force	..	From 8th Military District.

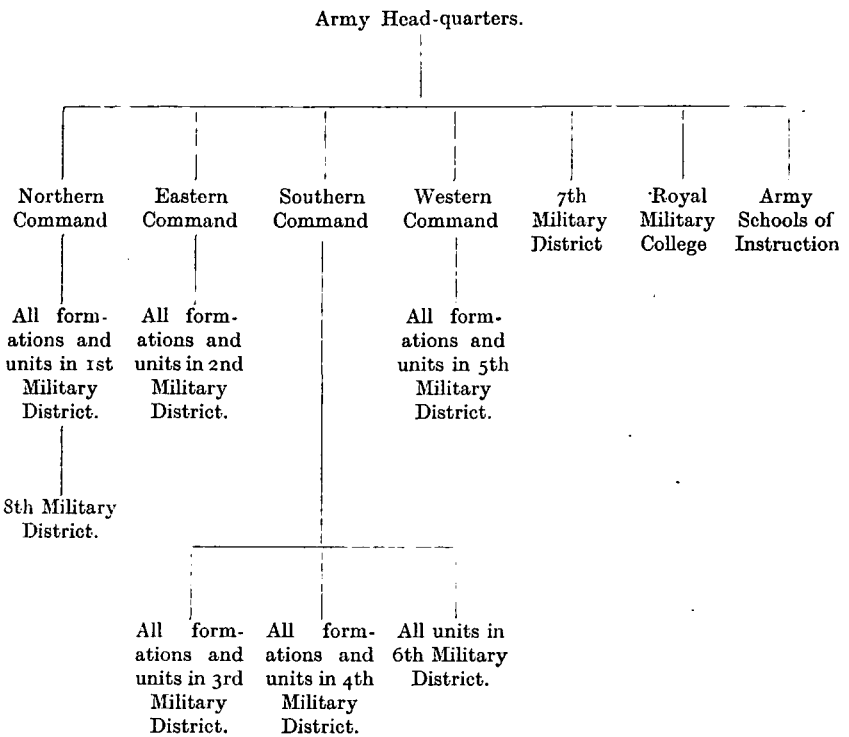
In March, 1943, First and Second Armies took over from Queensland, New South Wales and Victoria lines of communication areas the command of all coast and static anti-aircraft artillery defences and training establishments. On 16th June, 1944 Western Command was re-established and took over the combined responsibilities of III. Australian Corps and Western Australia Line of Communication Area.

(*o*) The fifteenth phase : In March, 1946, the Military Board and the organization of commands and military districts (see (i)) was re-introduced.

(ii) *Population of Military Age. Census*, 1933. The following particulars show the numbers of males of military age in the population of Australia, as at the Census of 30th June, 1933. The total number of cadet age, between 12 and 18 years, was 371,000 ; at citizen soldier age, between 18 and 26 years, 482,000 ; and between 26 and 35 years, 472,000 ; making a total of 954,000 between the ages of 18 and 35, which is considered the best period for military service. It is estimated that 620,000 of the males between the ages of 18 and 35 were unmarried or widowers without children, and 334,000 were married or widowers with children. In addition to the abovementioned, there were 972,000 males between the ages of 35 and 60 in Australia at the 1933 Census.

(iii) *Allotment of Units.* Under the Command Organization (*see* (i) (*i*) and (*o*) above) units are raised on a territorial basis, each State supplying its proportion of the personnel required for the fighting services.

COMMAND ORGANIZATION.



Military Districts conform generally to State or Territory areas, as follows:—1st Military District, Queensland; 2nd, New South Wales; 3rd, Victoria; 4th, South Australia; 5th, Western Australia; 6th, Tasmania; 7th, Northern Territory; 8th, New Guinea. Third Military District includes a considerable portion of Southern New South Wales, and 4th includes Broken Hill.

(iv) *Strength of Military Forces.* There was little alteration in the numbers serving in the Australian military forces from the institution of the Commonwealth to the year of the introduction of the compulsory training system. From 1913 to 1918, however, the annual increase was considerable. As a result of the International Conference which met at Washington on 11th November, 1921, it was decided to continue the universal training law, but its operation was restricted to the more populous centres and to certain quotas only. From 1st July, 1922 to 30th June, 1925, training in the Senior Cadets was limited to two quotas instead of four, and in the Citizen Forces to two quotas instead of seven. On 1st July, 1925, Senior Cadet training was reduced to one quota only, while Citizen Force training was increased to three quotas. These conditions remained in force until 1st November, 1929, when the constitution of the forces on a voluntary basis was adopted. During the period last mentioned, Senior Cadet training commenced on 1st July of the year in which Senior Cadets reached the age of 17 years, and on 1st July of the following year they were allotted to the Citizen Forces, in which training continued until 30th June of the year in which they attained the age of 21 years. Notwithstanding

the reduction in training, all males residing within 5 miles of a training centre were required to register during the months of January or February of the year in which they reached the age of 14 years. Junior Cadet training of boys of the ages of 12 and 13 years, which was in abeyance during the years 1922–23 and 1923–24, was also supervised by the Defence Department during the period 1st July, 1925, to 31st October, 1929.

Under the voluntary enlistment system, personnel might enlist for a first period of three years, and on its completion, the member concerned might be re-engaged for successive periods of two or three years until he reached the age for retirement.

The Australian Cadet Corps is a voluntary organization comprised of Senior Cadet Detachments raised at educational establishments in all States of the Commonwealth. It serves as a training ground to provide, to some extent, the future officers and non-commissioned officers of the Australian Military Forces, and, as such, occupies a foremost position in the scheme of national defence. The minimum age for enrolment in school detachments is 14 years and cadets, who receive a free issue of A.M.F. pattern uniform, may remain therein until they cease to be pupils of respective educational establishments. Provision is made for the appointment of officers, warrant and non-commissioned officers on an authorized scale from within school detachments which, as a matter of general policy, are not affiliated with units of the Military Forces, but may be so affiliated in special cases. The establishment for the whole Corps is 25,000 and by March, 1946 the number of Senior Cadet Detachments had been increased to 186 with an aggregate strength of approximately 22,350.

(v) *Royal Military College.* This College was established in 1911 at Duntroon in the Australian Capital Territory for the purpose of providing trained officers for the permanent military forces. In January, 1931 the College was transferred to Victoria Barracks, Sydney, but it returned to Duntroon early in 1937. Further particulars respecting the College are given on p. 915 of Official Year Book No. 15.

(vi) *Rifle Clubs.* The Australian Rifle Club movement, which had its origin in 1888, is provided for in the Defence Act and comprises a Commonwealth Council of Rifle Associations, which functions in an advisory capacity to the Minister and in the promotion of Inter-Empire and Interstate rifle competitions, State Associations, District Unions and Clubs. Prior to 1931 the administration of the organization was the responsibility of the Secretary for Defence. From that year its control reverted to the Military Board and Rifle Clubs were affiliated as reserves to Militia Force units. They continued in this role until the outbreak of the recent war, when, owing to the urgent demands of the A.I.F. and A.M.F., supplies of ammunition were cancelled and all rifles of members were impressed, mostly on payment. In 1941, rifle clubs were placed in recess and, with the exception of annual miniature rifle competitions, remained inactive until recently. When placed in recess, the efficient strength of the rifle club movement was 1,018 clubs and 36,478 members. From available statistics, it is estimated that, of the membership mentioned, approximately 20 per cent. served overseas and a further 60 per cent. performed home service duties during the recent war. A resumption of rifle shooting activities has now taken place.

3. **1939–45 War.**—(i) *General.* At the outbreak of war in September, 1939, Australia possessed a partly trained militia force of 80,000 men supplemented by a small force of permanent soldiers and a Staff Corps of trained officers.

Recruitment of a special expeditionary force of volunteers, the Second Australian Imperial Force, began in September, 1939. In November, 1939, the compulsory provisions of the Defence Act were put into effect and the first class of eligible men was called up for full time duty for home defence. In the South West Pacific Area the Australian Imperial Force and Citizens Military Force fought as a unified command.

The first convoy of the A.I.F. sailed from Australia in January, 1940, and commenced war training in Palestine. The original intention was that after training in the Middle East the Australians would move to the Western European Front, but the collapse of France necessitated the discarding of this plan. A corps of three divisions (6th, 7th, and 9th) was eventually established in the Middle East while the greater part of a fourth (8th) was in Malaya. Part of the first division to sail from Australia was diverted to England but rejoined the main body in Egypt early in 1941.

Two of the three Middle East divisions returned to Australia early in 1942, and the third early in 1943, to meet the Japanese threat to Australia. The troops of the division in Malaya were mostly lost as prisoners of war upon the collapse of Singapore. Other A.I.F. units were sent to garrison Rabaul, Ambon, Timor and smaller islands off the northern coast of Australia. One force while travelling from the Middle East in 1942 was diverted to assist the Dutch in Java. Upon their return the A.I.F. divisions joined C.M.F. troops in New Guinea where the Japanese had gained a strong foothold in preparation for their drive against the Australian mainland. Thereafter the Australian forces were engaged in the South West Pacific Area.

(ii) *Middle East.* Late in December, 1940, after intensive training in Palestine and Egypt, the 6th Division came under command of General Wavell and relieved the 4th Indian Division between Sidi Barani and Sollum. On 3rd January, 1941, in conjunction with British ancillary units, the division attacked the Italian fortress at Bardia. Bardia fell on 5th January and with it 40,000 prisoners, 400 field guns, 130 tanks and much other booty. Retreating westwards across the desert the Italian army made its next stand at Tobruk. This fell to the Australian infantry and British tanks on 22nd January. The campaign then resolved itself into one of pursuit, and Derna, Cirene, and Barce fell in quick succession. Benghazi was surrendered to the Australians on 7th February. The Australian troops had advanced 360 miles in a little more than a month since their first action.

Because of aid having been promised to Greece, now facing invasion by the Germans, the 6th Division was withdrawn from the Western Desert and sent across the Mediterranean. Its place in the desert was taken by the 9th Division which was not, however, equipped for immediate action, being short of equipment, arms and vehicles. Greatly strengthened by the addition of German infantry, artillery and armoured units, the Axis forces heavily counter-attacked and forced the British and Australian forces to withdraw some 270 miles to Tobruk. Here the old Italian perimeter was hastily developed and manned while the Axis forces by-passed the town and isolated the garrison by cutting the Bardia road to the East. With its only communication with Egypt by sea, the garrison settled down to a siege by greatly superior forces. Continually short of water and food and harassed from the air, the Australian and British troops repulsed several heavy attacks by tanks and infantry, and maintained their resistance until relieved late in the summer of 1941.

In Greece the 6th Australian Division joined British and New Zealand forces. The Australian division and the New Zealand division became the Anzac Corps, thus reviving the association which led to the forming of the first Anzac Corps in 1915.

Only part of the 6th Division, however, had reached the front on the northern border of Greece when the Germans attacked in strength. Worn out by their long campaign against the Italians, the Greek army was quickly overwhelmed. Heavily outnumbered the force fell back to the Thermopylae Pass where the enemy was held for several days while ships were assembled for the evacuation.

On the night of 24th April the evacuation commenced and continued on the 25th, 26th and 27th, greatly hampered by the enemy's complete command of the air.

The main Allied force, after evacuating Greece, moved direct to Egypt, but a large number of troops, including several thousand Australians, was landed on Crete. The island was not prepared for a large scale attack, being short of all essentials, but the mixed British, New Zealand and Australian force was reorganized, equipped as well as possible, and disposed at strategic ports and aerodromes.

On 20th May, after a heavy air offensive, German paratroops were dropped and troop carrying gliders were released between Maleme and Canea. Fierce fighting followed. On 30th May an Australian battalion took up a holding position on a ridge over the beach at Sphakia from which the main force was evacuated to Egypt and Palestine.

In June, 1941, to forestall a possible German thrust into pro-Axis Syria, the 7th Division moved from Palestine to join British, Indian and Free French Forces in a three-pronged drive through that country.

Damascus surrendered on 21st June, after Australian troops had cut the Damascus-Beirut road, and General Dentz was granted a general armistice on 12th July, after the fall of Damour.

The last action of the Australian troops in the Middle East was fought by the 9th Division after the 6th and 7th had returned to Australia. After training in Syria, the 9th, together with the New Zealand Division, moved to Egypt and joined General Montgomery's Eighth Army. At this time the Axis forces had achieved considerable success by their rapid re-conquest of Cyrenaica and advance into Egypt. On 23rd October, 1942, after a series of smaller actions the Eighth Army launched an offensive which culminated on 4th November in the break through at El Alamein. This action opened the way for the advance of the Allied forces to Tunisia and the driving of the enemy out of Africa. After El Alamein the 9th Division was moved to Palestine and embarked a few weeks later for Australia.

(iii) *Malaya.* In Malaya troops of the 8th Australian Division first came under fire from the Japanese at Gemas, 150 miles north west of Singapore, where heavy casualties were inflicted on the enemy. However, the Japanese tactics of encirclement through the swamp and jungle, and by the sea in small craft, were so successful that the British-Australian force was compelled to fall back to Singapore island. The Australian battalions were given the western part of the island to defend, but their exposed position proved vulnerable to the enemy's air attacks. On the night of 8th February the Japanese attacked in strength and gained a foothold on Singapore island. The Australian troops moved further back and formed a strong perimeter which was still being held when the Command capitulated.

In an effort to stem the rapid Japanese drive westward a small body of homeward bound Middle East A.I.F. troops was diverted to Java to assist the Netherlands forces. On 28th February the Japanese landed at three different points and the garrison was overwhelmed. Organized resistance ended on 9th March, 1942.

(iv) *New Guinea and Adjoining Islands.* Immediately after the Japanese entered the war a small Australian force was sent to assist the Dutch in defending Timor. When the Japanese struck at Dutch Timor in the middle of February, 1942, part of this force had been transferred to Dilli, the capital of Portuguese Timor. The small garrison in Dutch Timor, although offering bitter resistance, was soon overwhelmed, but many Dutch and Australian troops managed to escape to join the Australian force at Dilli. In the same month the Japanese invaded Portuguese Timor. Here also the garrison resisted stubbornly, but the weight of numbers told. The surviving Australian troops took to the hills and assumed their predetermined role. Out of communication with the outside world for several months, the force carried on aggressive harassing tactics against a much stronger enemy. With wireless communication restored by about the middle of April, supplies were smuggled in and wounded evacuated by submarine. Reinforcements were landed in September, but the situation became impossible and the force was withdrawn in January, 1943.

Towards the end of January, 1942, the Australian garrisons, each of one battalion in strength at Rabaul, in New Britain, and on the island of Ambon, were overwhelmed by enemy forces. A small number of the Rabaul troops managed to make their way to the hinterland and later escaped to Australia.

In preparation for the invasion of the Australian mainland, a large Japanese force landed at Lae on the north-east coast of New Guinea in March, 1942. In July, more troops were landed at Buna and Gona further to the east. From Buna the Japanese commenced a southward drive over the rugged Owen Stanley mountains towards Port Moresby. This drive was stopped in September at Eoribaiwa Ridge by a seasoned Australian brigade of Middle East veterans and marked the turning-point in the war against Japan. Pressing home their success, Australian forces beat the Japanese back to the north coast and with the assistance of United States units eliminated the enemy force at Buna, Gona and Sanananda after four months' heavy fighting.

Part of the general plan of the Japanese for the capture of Port Moresby was the seizure of the natural harbour and air base at Milne Bay. To effect this a Japanese Special Naval Landing Force was put ashore under naval protection on the north-western corner of Milne Bay. Here they were opposed by two Australian infantry brigades. After several days of bitter fighting the survivors of the Japanese force evacuated by sea. This was the first defeat suffered by the enemy in their southward drive.

The next move of the Japanese in New Guinea was an overland drive from Salamaua in an attempt to capture the lightly held airfield at Wau. While the actual attack was in progress reinforcements were flown in and the Japanese force was routed. This began for the 3rd Division an arduous seven months' campaign during which the Japanese were driven back over the mountains and which culminated in the recapture of Salamaua on 11th September, 1943.

Meanwhile the 9th Division in co-operation with the United States Navy and Air Force landed east of Lae on the Huon Gulf, while the 7th Division, preceded by United States paratroops, landed at Nadzab, north-west of Lae. The two divisions converged quickly on the Japanese base and Lae fell to the 7th Division on 16th September, 1943. Part of the 9th then left the main body and moved east towards Finschhafen. The rest of the division followed and, after an opposed amphibious landing, Finschhafen fell to the Australians on 2nd October. By November, 1943, the Japanese were finally cleared from the hill country around Satelberg and Wareo and the advance was continued along the coast to Sio. Here the 5th Division took over and moved on to Saidor, to the east of which contact was made on 10th February, 1944 with a United States force which had landed at Saidor on 2nd January to cut the Japanese line of retreat.

Moving inland from Lae up the Ramu Valley the 7th Division captured the airfield at Dumpu and cleared the enemy from the Finisterre Ranges. Relieving the 7th the 11th Division pressed on through Bogadjim to capture the port of Madang on 24th April. The advance along the coast was continued by the 5th Division. Alexishafen fell on 26th April. The Division reached Hansa Bay on 12th June and the mouth of the Sepik River on 13th July, 1944.

Late in 1944 Australian troops relieved the United States garrisons at Aitape in New Guinea, at Bougainville in the Solomons, and on New Britain. In the three areas the original task of the Australians was that of a holding role but the unexpected strength of the enemy led to heavy fighting at Aitape and on Bougainville.

From Aitape the Australians moved in two forces, one east along the coast, the other over the Torricelli Mountains, in an attempt at a pincer movement to drive the Japanese back to their main base at Wewak. Hampered by the swift flowing rivers and a high rate of sickness from malaria and scrub typhus the coastal force pushed through to capture Wewak on the 11th May, 1945. As the drive advanced along the coast thousands of the enemy moved inland over the mountains and strengthened the resistance against the smaller Australian force inland. Bitter fighting was still raging at the time of the Japanese surrender.

On 23rd November, 1944, the 2nd Australian Corps took over command of the Northern Solomons from the United States forces, with head-quarters at Torokina on the island of Bougainville, and shortly afterwards commenced a three way drive to the north, to the south and across the centre. By June, 1945 the enemy to the north had been driven on to the narrow Bonis Peninsula and, although still resisting strongly, was in a hopeless position. In the centre of the island active patrolling from Pearl Ridge towards Numa Numa had achieved complete control of the cross-island routes from Torokina, while the southern advance by the 3rd Division into the Buin area had set the stage for a decisive battle. This action was progressing favourably at the time of the Japanese surrender.

Responsibility for New Britain passed from the United States forces to the 5th Division in November, 1944. The main body of the division was based at Jacquinot Bay on the south coast while a battalion group occupied the Cape Hoskins area on the north coast.

Moving mainly by water in a series of bounds both forces progressed northwards until by 9th April forward troops were firmly established across the neck of the Gazelle Peninsula upon which the Japanese garrison was confined.

With its main task completed the force then commenced intensive patrolling of the Peninsula to discover the enemy's strength and dispositions so that plans could be laid for a later offensive. This action was proceeding when Japan surrendered.

(v) *Borneo.* The final campaign fought by Australian troops in the war was an attack by two divisions on Borneo. The operation was divided into three phases. On 1st May, 1945, a brigade group of the 9th Division, assisted by a small Netherlands East Indies force, went ashore on the island of Tarakan off the east coast and by June had taken possession of the island. This action was followed on the 10th June by the landing of the rest of the division on the former British territory of North Borneo.

On 1st July the 7th Division landed in the Balikpapan region of the east coast. Enemy opposition in each case was strong but at the time of the cessation of hostilities valuable territory had been recaptured.

(vi) *Women's Services.* At the outbreak of war the only women's service in existence was the Australian Army Nursing Service. The first contingent of nurses proceeded to Palestine early in 1940. During the war members of the A.A.N.S. served in England, Australia, Palestine, Libya, Egypt, Greece, Eritrea, Syria, Malaya, Ceylon, Papua, New Guinea, Solomons, New Britain, and Borneo.

War Cabinet approved of the formation of an Australian Women's Army Service on 13th August, 1941, its object being to release men for employment with fighting units. Enlistment began early in January, 1942. On 15th November, 1944, War Cabinet gave approval for the posting of up to 500 volunteers to New Guinea. A draft of 15 officers and 333 other ranks took up duty at Head-quarters First Army early in May, 1945.

In December, 1942, the Australian Army Medical Women's Service was formed to replace Voluntary Aid Detachments on full time service. Former V.As. formed the nucleus of this Service. A.A.M.W.S. served with hospitals overseas and in a hospital ship.

(vii) *Volunteer Defence Corps.* The Corps was inaugurated on 15th July, 1940. It reached its maximum strength in June, 1942, when enlistments totalled 98,000. The members, a few on full time, others on part time duty, were employed as plane spotters, coast watchers, and protectors of vital industries. Early in 1943 the Corps was charged with the responsibility for the manning, on a part time duty basis, of anti-aircraft and coast defence installations, including the close defence of fortress areas as its primary role. As a result of this policy over 10,000 full time duty A.M.F. personnel were released for duty in forward areas.

In consequence of the cessation of hostilities in August, 1945, authority for the complete disbandment of the Corps was announced.

(viii) *Gross Enlistments.* The number of gross enlistments as at 28th February, 1946, was as follows :—

Australian Imperial Force	(a)460,466
Citizens Military Force	224,428
Permanent Military Force	6,496
Australian Army Nursing Service	3,857
Australian Women's Army Service	23,988
Australian Army Medical Women's Service	7,917
	727,152

(a) Includes direct enlistments and 200,008 transferred up to 16th February, 1946 from Citizens Military Force to Australian Imperial Force.

(ix) *Casualties.* Particulars of casualties will be found in § 5 following.

(x) *Honours and Awards.* A list of the numbers of the various awards and decorations conferred is contained in § 6.

4 **Australian Military Forces in the 1939-45 War—Chronology.—**

MIDDLE EAST.

1939.

15*th December.*—Advance party of Australians embark for the Middle East.

1940.

11*th January.*—First Australian convoy (6th Australian Division) sails for Middle East.

1941.

3*rd January.*—Australian troops attack and penetrate Bardia defences. 5*th January.*—Bardia falls. 22*nd January.*—Tobruk falls. 30*th January.*—Australians enter Derna. 6*th February.*—Benghazi surrenders to Australians. 21*st March.*—Australians capture Giarabub. 24*th March.*—British and Australians commence withdrawal from area of El Agheila. 10*th April.*—Last Australian rearguard reaches Tobruk. First engagement of Australian and German forces on Greek front. 14*th April.*—First major Axis attack on Tobruk fails. 20*th April.*—British and Anzac forces in Greece withdraw to Thermopylae Line. 24th *April.*—Evacuation of Greece begins. Australians arrive in Crete. 20*th May.*—German paratroops land in Crete. 31*st May.*—British and Anzac forces evacuated from Sphakia. 8*th June.*—Australians (7th Division) cross Syrian Frontier. Tyre surrenders. 21*st June.*—Fall of Damascus. 9*th July.*—Damour taken after bloody fighting. 12*th July.*—Cease fire. French resistance ceases.

1942.

4*th February.*—Australians commence embarking for Australia at Suez. 10*th July.*—9th Australian Division goes into action at El Alamein. 23*rd October.*—9th Australian Division launches first attack in the British thrust at El Alamein.

1943.

1*st February.*—9th Australian Division sails for Australia.

MALAYA.

1941.

18*th February.*—Units of the 8th Australian Division arrive in Malaya.

1942.

14*th January.*—Australian troops make first contact with Japanese forces in Malaya. 15*th February.*—Fall of Singapore.

SOUTH WEST PACIFIC.

1941.

17*th December.*—Australian and Dutch forces occupy Timor.

1942.

23*rd January.*—Japanese land at Rabaul. 18*th February.*—Australian troops arrive in Java. 19*th February.*—Australian troops resist Japanese landing in Timor. 27*th February.*—Japanese land in Java. 7*th March.*—Japanese land at Lae and Salamaua. 10*th March.*—Japanese land at Finschhafen. 21*st July.*—Japanese land at Gona. 23*rd July.*—First contact between Australians and Japanese at Awala. 10*th August.*—Australian troops withdraw from Kokoda. 25*th August.*—Australians oppose Japanese landing at Milne Bay. After bitter fighting Japanese forces are withdrawn by sea on 5th September, having suffered their first decisive defeat on land. 28*th September.*—Australians re-take Eoribaiwa Ridge in the first stage of the Owen Stanleys offensive.

2nd November.—Australians re-capture Kokoda. *9th November.*—Australians re-take Gorari. *11th November.*—Australians capture Oivi. *13th November.*—Australians capture Wairopi. *9th December.*—Australians occupy Gona. *19th December.*—Australians and Americans capture Cape Endaiadere.

1943.

2nd January.—Australians and Americans re-capture Buna. *22nd January.*—Australians and Americans take Sanananda. *30th January.*—Australians defeat Japanese attack on Wau. *3rd February.*—Australians at Wau counter-attack and begin the drive to Salamaua. *16th March.*—Japanese cleared from Mubo gardens. Area finally cleared 13th July. *21st August.*—Australians capture Komiatum Ridge. *4th September.*—Australians land at " Red Beach " on shore of Huon Gulf and begin drives to Lae and Finschhafen. *5th September.*—American paratroops and Australian paratroops, artillery, engineers and pioneers seize Nadzab. *7th September.*—Aerial movement of Australian troops into Markham Valley begins. *11th September.*—Australians capture Salamaua. *16th September.*—Australians take Lae. *2nd October.*—Australians take Finschhafen. *4th October.*—Australians capture Dumpu (Ramu Valley). *25th November.*—Australians drive Japanese from Satelberg Heights. *8th December.*—Australians capture Wareo.

1944.

23rd January.—Australians capture Shaggy Ridge. *10th February.*—Australians and Americans link up east of Saidor. *13th April.*—Australians take Bogadjim. *24th April.*—Australians take Madang. *26th April.*—Australians take Alexishafen. *14th June.*—Australians occupy Hansa Bay. *11th October.*—Australians land on New Britain. *23rd November.*—Australians take over from U.S. troops in Bougainville. *1st December.*—Australians take over from U.S. troops in Aitape, New Guinea. *17th December.*—Australians cross Danmap River, New Guinea. *18th December.*—Australians occupy Artillery Hill, Bougainville. *30th December.*—Australians occupy Pearl Ridge, Bougainville.

1945.

5th February.—Australians clear Balif, New Guinea of enemy. *5th March.*—Australians take Saposa Island, in the Solomons. *16th March.*—Australians firmly established in Soraken plantation, Bougainville. *17th March.*—Australians occupy But airfield, near Wewak, New Guinea. *20th March.*—Australians land on Soraken Peninsula, Bougainville. *22nd March.*—Australians capture Dagua airstrip, near Wewak, New Guinea. *23rd March.*—Waitavalo and Tol plantations, New Britain, captured. *30th March.*—Australians win battle of Puriata River, Bougainville. *21st April.*—Maprik villages and airfield, in Torricelli mountains south of Wewak, captured. *11th May.*—Wewak captured in combined amphibious landing and land assault. *17th May.*—Cape Boram, Wewak Area and Boram airfield captured. *22nd May.*—Cape Moem, Wewak Area captured, thus restoring Allied control of entire British New Guinea coast. Buin road, Bougainville, between Hongorai and Pororei rivers cleared by Australian troops. *8th June.*—Australian troops landed on Bonis peninsula, northern Bougainville. *11th June.*—Australian troops occupied Yamil in Torricelli mountains, New Guinea. *16th June.*—Total of 10,000 Japs reported killed in New Britain campaigns.

BORNEO.

1945.

1st May.—Australian troops landed at Tarakan Island (N.E. Borneo). *6th May.*—Tarakan Town, Pamoesian oilfield and airstrip occupied. *11th May.*—Djoeata oilfield occupied. *10th June.*—Australian troops landed at Brunei Bay (N.W. Borneo), including Labuan and Muara Islands. *13th June.*—Australian troops capture Brunei Town. *15th June.*—Organized resistance ceases at Labuan Island. Muara Island reported clear of enemy. *20th June.*—Australian troops landed in Sarawak (N. Borneo), at Lutong. *22nd June.*—Organized resistance ceased on Tarakan. *22nd-23rd June.*—Seria (Brunei) and Miri-Lutong (Sarawak) oilfields captured. *1st July.*—Australian troops landed at Balikpapan (S.E. Borneo).

§ 2. Naval Defence.

1. **General.**—Information regarding naval defence systems prior to 1901 will be found in Official Year Book No. 2, p. 1084 while reference to the system of naval defence and the strength of the Naval Forces prior to the 1939-45 War appears in Official Year Book No. 32, p. 238.

2. **Growth and Activities of the Royal Australian Navy during the 1939–45 War.**—(i) *Introductory.* On 2nd September, 1939, one day before the outbreak of war, the Royal Australian Navy was placed at the disposal of Great Britain. Before twelve months had passed, ships and men of the R.A.N. had been in action against the enemy in the Mediterranean, Arabian and Red Seas, and the Pacific and Atlantic Oceans.

(ii) *Naval Strength.* (*a*) *At Beginning of War.* The R.A.N. began the war with a small but balanced fleet, comprising six cruisers, five destroyers, two sloops, a survey ship and a depot ship, totalling approximately 60,000 tons. Construction of another two sloops had begun. The strength in ships was further increased during 1940 and 1941 by the taking up for naval duties of various merchant ships (armed merchant cruisers, minesweepers, etc.) and by the addition of four modern "N" class destroyers made available by the Admiralty. These were later added to by one "N" and two "Q" class destroyers, and the heavy cruiser *Shropshire* which was handed over as a gift from Britain to replace the *Canberra*, lost during August, 1942, at the first Savo Island Battle, Solomon Islands.

(*b*) *Naval Construction.* An extensive naval shipbuilding programme was commenced during 1940, and although at that time the Australian shipbuilding industry was of almost negligible proportions, highly satisfactory results were achieved during the war years when the following vessels were constructed:—Three Tribal Class destroyers—*Arunta, Warramunga, Bataan*, 7 Frigates (one not commissioned at end of war), and 60 Australian minesweeping vessels (corvettes), the majority of 650 tons displacement.

In addition, a floating dock of 2,000 tons, 3 oil fuel lighters of 1,200 tons, 35 fairmile motor launches of 80 tons, boom defence vessels, landing craft and other small vessels were constructed.

(*c*) *Naval Vessels Lost.* The following Australian naval vessels were lost during the war:—Three cruisers, 4 destroyers, 2 sloops, 3 corvettes, 1 auxiliary minesweeper, 1 depot ship, 4 store carriers, 1 small survey vessel and 2 fairmiles.

(*d*) *Strength at end of War.* At the date (2nd September, 1945) of the formal surrender of the Japanese Empire, Australian Naval strength consisted of:—Three cruisers, 9 destroyers, 3 landing ships (infantry), 1 destroyer transport, 1 destroyer escort, 2 sloops, 6 frigates, 53 corvettes (Australian built minesweepers), 3 auxiliary anti-submarine vessels, 5 auxiliary minesweepers, 10 auxiliary vessels (ammunition, victualling and store carriers), 1 fleet oiler, 3 repair ships, 9 boom defence vessels, 5 tugs, 2 cable repair ships, 7 surveying vessels, 28 fairmiles, 26 harbour defence motor launches, and 140 miscellaneous small craft.

(iii) *Naval Operations.* (*a*) *2nd September, 1939 to 6th December, 1941.* When hostilities commenced, the main units, with the exception of *Perth*, were in Australian waters. *Perth* remained until March, 1940 on patrol and escort duties in the Caribbean Sea and Western Atlantic. By Christmas, 1939, the five destroyers were in the Mediterranean where the *Sydney* joined them before the entry of Italy into the war in June, 1940. From then on, right throughout the difficult days of the Naval War in the Mediterranean, the R.A.N. was strongly represented there by cruisers, destroyers and sloops. There were never between May, 1940 and December, 1941 less than one cruiser and four destroyers serving with the Mediterranean Fleet at any one time. During the months of May and June, 1941—the critical period of the evacuations of Greece and Crete, the Syrian campaign and the enemy investment of Tobruk, in all of which operations the R.A.N. ships were actively engaged—nine units including *Perth*, seven destroyers and one sloop were in the Mediterranean. During this period the destroyer

Waterhen and the sloop *Parramatta* were lost in action, while on the "Tobruk Ferry Run". On this run Australian destroyers inaugurated carrying supplies from Mersa Matruh and Alexandria to the beseiged troops at Tobruk.

Sydney played the principal role in an outstanding action in the Mediterranean during July, 1940, when she put to flight two Italian cruisers, one of which, *Bartolomeo Colleoni*, was crippled by *Sydney's* fire, and finished off by torpedoes from R.N. destroyers *Ilex* and *Hyperion*. *Sydney* was afterwards lost in November, 1941 while in the Indian Ocean, during an engagement with the German raider *Steiermark* in which the enemy vessel was sunk.

Australia was active in the Atlantic from June, 1940 to February, 1941, and was involved in the operations off Dakar (July and September, 1940). In the second phase of that undertaking, she put out of action a Vichy French destroyer of the Fantasque Class. Before leaving Dakar, *Australia* herself was slightly damaged.

During early August, 1940, *Hobart* assumed the major role in the direction of the evacuation of British Somaliland at the port of Berbera, and carried out the final demolitions and bombardment of that port.

A year later, in the Persian Gulf, the armed merchant cruiser H.M.S. *Kanimbla*, manned by R.A.N. personnel, and the sloop *Yarra* helped to immobilize Iranian warships in the Karun River, and captured several Axis merchant ships at Bandar Shapur.

(*b*) *7th December, 1941 to end of War.* When Japan struck with overwhelming force on 7th December, 1941, eight R.A.N. ships were in Malayan waters. Six others, including *Hobart* and *Perth*, arrived soon afterwards. From then on, until after the invasion of Java in late February, 1942, the ships were under almost constant enemy air, submarine and surface attacks as they carried out their duties of minesweeping, anti-submarine protection, patrolling and convoy escort work. The destroyer *Vampire* was on the screen of H.M. Ships *Prince of Wales* and *Repulse* when they were sunk off Malaya by torpedo bombers on 10th December, 1941; *Vampire* rescued 225 survivors. *Vampire* was later sunk by enemy aircraft during the Japanese task force raid into the Bay of Bengal in April, 1942. The sloop *Yarra* was lost while endeavouring to defend a small convoy against a Japanese force of three heavy cruisers and four destroyers. *Perth* was lost in action against numerically superior enemy forces in Sunda Strait on the night 28th February–1st March, 1942. The remaining Australian ships were among the last to leave Singapore and the Dutch East Indies.

Nearer home, the R.A.N. was active in the close defence of Australia. Troops and supplies were carried to Ambon, Dutch Timor, Papua and New Guinea. The R.A.N. was responsible for all shipping movements, the supply of convoy escorts and anti-submarine protection. Much of this work was carried out under heavy enemy air attack, and without our own air cover. *Australia* and *Hobart* were part of the Allied cruiser and destroyer Task Force which screened Port Moresby during the Coral Sea Battle in May, 1942, in which U.S. carrier aircraft smashed Japanese invasion forces and frustrated the enemy attempt on Port Moresby. This proved to be the point at which the Japanese seaborne drive on Australia was finally halted.

Throughout the period of the building up for, and the eventual mounting of, the offensive against Japan in the South West Pacific, the R.A.N. was responsible for the maintenance of essential sea communications between Australia and New Guinea. It was also responsible for the maintenance of the Australian coastal traffic which transported the vital raw materials for heavy industry. The corvettes and survey ships of the R.A.N. led the gradual encroachment of Allied power around the eastern tip of New Guinea, and made possible the successful campaigns which followed. The cruisers *Australia*, *Canberra* and *Hobart* led the Allied attack on the Solomon Islands in August, 1942, during which *Canberra* was lost. The destroyer *Voyager* was lost during the night of 22nd September, 1942, while disembarking Army personnel and stores at a point on the Timor coast about which only meagre navigational data were available. The corvette *Armidale* was lost to enemy air attack in the Arafura Sea during December, 1942, while reinforcing Australian Army forces in Timor.

December, 1943 marked the beginning of the long series of amphibious operations which finally defeated the enemy forces in the South West Pacific. The cruisers and Tribal destroyers operating with Task Forces under the control of the Commander (United States) of Allied Naval Forces, South West Pacific, took part in practically every one of these operations, which included the landings at Arawe, Cape Gloucester, Saidor, Admiralty Islands, Hollandia, the Islands of Biak, Noemfoor, Morotai, Leyte and Luzon, and the three Borneo landings (Tarakan, Brunei and Balikpapan) of the A.I.F. R.A.N. ships of all types supported Australian Army operations in New Guinea, New Britain and the Solomons areas, and R.A.N. survey ships were prominent in the preliminary work for all the operations of this period.

During the invasion of the Philippine Islands, Australian cruisers, destroyers and landing ships took part in the operations off Leyte Island in October, 1944. *Australia* suffered damage when struck by an enemy aircraft and sustained 30 fatal casualties—including her Commanding Officer—and a number of wounded. *Shropshire* and *Arunta* also took part in the Battle of Surigao Strait later in the month.

In January, 1945 Australian cruisers and destroyers took part in the invasion of Luzon Island. *Australia*, which had been repaired was again damaged, this time by five enemy suicide aircraft, and extensive repairs were necessary.

Following Japan's entry into the war, the five "N" and two "Q" Class destroyers together with 13 corvettes served with various British Commands, mainly with the Mediterranean and Eastern Fleets. Some of them took part in operations such as the invasions of Madagascar and Sicily, and in the landings in North Africa; others assisted the great Russian drives by carrying out monotonous but valuable escort work in the Persian Gulf, the southern point of entry for war material destined for Russia. The destroyers took their part in fighting the convoys through to Malta, enabling that fortress to withstand the heaviest air attacks the Italians and Germans could inflict on it. It was after the crucial Malta convoy battle in June, 1942, that the destroyer *Nestor*, while returning to Alexandria, was sunk by enemy aircraft.

During the last year of the war, the "N" and "Q" destroyers and 18 corvettes (21st and 22nd Minesweeping Flotillas) were attached to the British Pacific Fleet. These ships, and the 3,000 personnel involved, were additional to the Australian warships and men serving under American operational control in the South-West Pacific area. All the ships formed part of the Task Units, British Pacific Fleet, and were engaged in the Fleet Train or on screening duties for carrier-borne operations against the Japanese mainland. After the surrender of Japan the 21st and 22nd Minesweeping Flotillas, together with 8 other corvettes, were engaged in minesweeping activities at Hong Kong and off the China Coast.

(iv) *Attacks on Australian Coastal Shipping.* Australian coastal shipping was not neglected by the enemy. Early in the war there occurred a series of daring attacks on passenger and cargo ships by German surface raiders which also shelled Nauru and laid minefields in our coastal waters. These raiders, the *Narvik*, *Manyo Maru* and *Tokyo Maru*, claimed their first victim, the French steamer *Notou*, en route from Newcastle to Noumea, on 12th August, 1940. Generally operating as a trio, they ranged over waters east and south of Australia for a period of slightly more than six months. They sank a total of 10 ships, including the 16,700 ton passenger liner *Rangitane*; they also laid minefields which were responsible for the loss of four ships and damage to a fifth. After sinking five ships in the Nauru area early in December, 1940, one of the raiders heavily shelled the phosphate loading equipment at Nauru, and the *Manyo Maru* and the *Tokyo Maru* landed 496 prisoners on Emirau Island. These survivors reached Australia by rescue ship on 1st January, 1941.

The next intrusion into the shipping lanes along the east coast of Australia occurred after the Coral Sea Battle, when Japanese naval operations south of the equator were confined to attempts to cut Allied lines of communication by submarine attacks. On the night of 31st May, 1942, Japanese midget submarines attacked shipping in Sydney Harbour, sinking the naval depot ship *Kuttabul*, a former Sydney ferry. At least three midget submarines were destroyed by Harbour defence vessels. The Sydney Harbour

raid was the precursor of a submarine campaign against shipping off the east coast of Australia, and during June several vessels were attacked, one being torpedoed and sunk. Although some of these submarines were destroyed by Allied aircraft, two more attacks were recorded in August, and between January and May, 1943, eight freighters and the hospital ship *Centaur* were torpedoed off the east coast.

No further attacks were experienced until December, 1944, when early in the month an Allied merchant ship was shelled by an enemy submarine in Bass Strait, and early on Christmas morning an Allied merchant ship was sunk by a torpedo from an enemy submarine between Sydney and Melbourne.

When, owing to the Japanese submarine menace, the convoy system was instituted around the Australian coast in June, 1942, Australian escort vessels were employed to protect the convoys. As the Allied forces moved northward to New Guinea and along the northern New Guinea coast, the convoys were extended, and, by the end of the war, Australian escort vessels had afforded anti-submarine protection to vast numbers of Allied troops and quantities of Allied war materials to places as far afield as Morotai, Borneo and the Philippines.

(v) *Naval Personnel.* One important difference marked the R.A.N. of September, 1939, from that of August, 1914. This was that the majority of the ships were commanded by R.A.N. officers, graduates of the R.A.N. college, and, with the exception of a few officers and men of the Royal Navy on customary exchange, the ships were manned throughout by Australian officers and men who had received their training at the Naval College and Flinders Naval Depot. Later, in May 1944, Captain J. A. Collins, C.B., R.A.N., was appointed to the operational command of the R.A.N. Squadron, with the rank of Commodore First Class. This was the first time in its history that the squadron had come under the command of an officer of the R.A.N., and a graduate of the R.A.N. college.

At the outbreak of war, the strength of the R.A.N. was 5,440. This figure was doubled overnight as Reserve personnel were mobilized. Some of the Reservists went into shore establishments on base staffs, Naval Control and the examination service; others were drafted immediately to sea, a large number sailing as gunners in defensively equipped merchant ships. There was never a shortage of volunteers, and recruiting progressed steadily.

At the end of the war, there were 36,257 mobilized personnel in the R.A.N. (exclusive of W.R.A.N.S. and the R.A.N. Nursing Service).

In June, 1944, there were still approximately 500 Australians serving on loan with the Royal Navy, and, of these, more than 400 were members of the Royal Australian Navy Volunteer Reserve. These volunteers enlisted under the "Yachtmans' Scheme" by which peace-time yachtsmen, pastoralists, professional men and business executives joined the R.A.N.V.R. for service with the Royal Navy. Those over thirty years of age were required to pass the navigation tests for the Yachtmaster's Certificate, and were granted commissions before they left Australia. The younger volunteers reached the United Kingdom as ratings, were trained in craft ranging from destroyers downwards, and then entered H.M.S. *King Alfred* training establishment to complete courses for their commissions. The first batch left for Britain in January, 1940, and the last group enlisted under the scheme sailed in February, 1942. Many distinguished themselves while serving in every type of vessel, and carrying out every type of duty. In June, 1944, R.A.N.V.R. officers serving with the Royal Navy held the following commands:—1 destroyer, 1 frigate, 2 corvettes, 1 submarine, 1 Fleet minesweeper, and 4 flotillas of tank landing craft.

This list does not take into account the considerable number of Australians commanding individual "little ships" such as motor torpedo boats and various types of landing craft.

(vi) *The Women's Royal Australian Naval Service.* The W.R.A.N.S. was first formed in April, 1941, and at the end of hostilities had a strength of 2,590 members who were serving at shore establishments in every State. The W.R.A.N.S. was created

so that men might be relieved for duty at sea and the shore establishments still maintained at full strength. The first W.R.A.N.S. joined as wireless telegraphists, and their success was so marked that before long others were serving as telegraphists, visional signallers, motor drivers, sick-berth attendants, dental mechanics and attendants, writers, supply assistants, cooks, stewardesses, telephonists and messengers. The W.R.A.N.S. trained their own officers, some for administrative work in connexion with the W.R.A.N.S., and others who undertook secretarial and similar appointments.

(vii) *The Royal Australian Naval Nursing Service.* This service was established in April, 1942, and when hostilities ceased had a membership of 60.

A total of 860 decorations and awards to R.A.N. personnel for actions in all theatres of war had been announced on the cessation of hostilities. This number included 18 awards bestowed by United States authorities, 4 Royal Netherlands and 4 Greek decorations.

(viii) *Casualties.* A table showing the numbers of casualties in the European and Pacific zones of operations is included in § 5.

(ix) *Decorations and Awards.* Particulars of decorations and awards appear in § 6 following.

§ 3. Air Defence.

1. **General.**—A statement respecting the preliminary steps taken in connexion with the development of air defence will be found in Official Year Book No. 18, p. 610.

2. **Expansion and Development of the Royal Australian Air Force during the 1939–45 War.**—(i) *Constitution and Expansion of Air Board.* Prior to 13th March, 1940, the Air Board consisted of the Chief of the Air Staff, the Air Member for Personnel, the Air Member for Supply, and the Finance Member (civilian). The Secretary, Department of Air was an ex-officio member of the Air Board.

On 13th March, 1940, the Air Board was re-organized and re-constituted as follows :— the Chief of the Air Staff, the Air Member for Personnel, the Air Member for Organization and Equipment, the Director-General of Supply and Production (civilian), and the Finance Member (civilian). The Secretary, Department of Air was an ex-officio member.

On 12th December, 1940, an additional member—the Business Member—was appointed.

The expansion of the R.A.A.F. and the formation of Allied Air Head-quarters necessitated a re-organization of the Air Board consequent on the transfer to Allied Air Head-quarters of the operational functions formerly exercised by the Chief of the Air Staff. This re-organization, which was effective from 4th June, 1942 until the cessation of hostilities on 15th August, 1945, provided for the following Board members :— the Chief of the Air Staff, the Air Member for Personnel, the Air Member for Engineering and Maintenance, the Air Member for Supply and Equipment, the Finance Member (civilian), and the Business Member (civilian). The Secretary, Department of Air was an ex-officio member.

(ii) *Strength of Personnel and Units at Outbreak of War.* The strength of the R.A.A.F. at the outbreak of war (3rd September, 1939) was 310 officers and 3,179 other ranks.

There were 12 squadrons in existence of which two were formed in nucleus only, while a number of the flying personnel of No. 10 Squadron was in England taking delivery of the Sunderland flying boats with which that squadron was to be equipped.

In addition to R.A.A.F. Head-quarters, there were four R.A.A.F. stations (Laverton, Richmond, Rathmines and Pearce), one Training Depot (Laverton), two Aircraft Depots (Richmond and Laverton), one Armament Training School (Cressy) and one Flying Training School (Point Cook).

The squadrons were located at Laverton, Richmond, Rathmines and Pearce, but during the precautionary stage prior to the outbreak of war, two squadrons (Nos. 12 and 23) moved to their permanent stations at Darwin and Archerfield.

As a gesture to the British Government, No. 10 Squadron, equipped with Sunderlands, was loaned to the R.A.F. Coastal Command on the outbreak of war. This was the first R.A.A.F. squadron to see action.

(iii) *War-time Development and Expansion of Front Line Squadrons.* The approved pre-war development programme was 19 squadrons with a first-line strength of 212 aircraft with a reserve of 50 per cent. This programme was to be completed by June, 1941.

At a meeting held on 22nd September, 1939, the Defence Committee endorsed a recommendation by the Air Board that the R.A.A.F. should be increased by 13 squadrons (making a total of 32) and consequent ancillary units.

War Cabinet on 2nd March, 1942 approved of a further expansion of the R.A.A.F. to 73 squadrons. Expansion in accordance with that plan was, however, retarded because of difficulties experienced in obtaining the requisite aircraft. As the result, following on decision of War Cabinet on 5th October, 1942, the planned rate of expansion of R.A.A.F. squadrons was reduced as follows:—(*a*) by April, 1943, to 35 squadrons; (*b*) by September, 1944, to 51 squadrons. The additional 16 squadrons were to be formed and maintained from local production.

That planned expansion was, however, retarded because aircraft deliveries fell below requirements and programmed deliveries.

On 2nd March, 1943, War Cabinet, taking into account revised figures of anticipated deliveries from overseas and local production, approved of the following recommendations relative to the expansion of the R.A.A.F:—(*a*) expansion of the R.A.A.F. in 1943 from 30 to 45 squadrons for which aircraft should be available from local and overseas production by December, 1943; (*b*) essential preliminary planning to be arranged for the further development of the R.A.A.F. up to a total of 51 squadrons in 1944; (*c*) the establishment of such ancillary units as were required to meet the operational needs of the Allied Air Forces in the South West Pacific Area; (*d*) appointment and enlistment of the necessary personnel required for such expansion.

In October, 1943, a review of the nature, extent and balance of the war effort in the light of manpower position was made by War Cabinet, and the monthly allotment of manpower to the R.A.A.F. was greatly reduced.

War Cabinet decided that the Commonwealth's part in the Empire Air Training Scheme should be directly related to the contemplated strength of the R.A.A.F. in the South West Pacific area; that, in order to avoid disrupting the E.A.T.S., the outflow of personnel should be continued on a diminishing basis; and that the strength of the R.A.A.F. should be stabilized at the (then) present strength in Australia (48 squadrons) plus the numbers that could be transferred from overseas, plus the strength that could be maintained from the reduced intake.

Following a review of the strength of the R.A.A.F. in October, 1943, it was estimated from the revised manpower allocation that the R.A.A.F. could be developed in 1944 to a total of 53 R.A.A.F. squadrons in Australia.

In addition to 53 R.A.A.F. squadrons in Australia, there were to be 3 R.A.F. squadrons (Spitfires) and 2 N.E.I. squadrons, as well as the two permanent squadrons of the R.A.A.F. overseas (Nos. 3 and 10)—a total of 60 squadrons.

By 1st September, 1945 there were 53 R.A.A.F. squadrons in S.W.P.A., 2 R.A.A.F. squadrons overseas (Nos. 3 and 10), plus 4 R.A.F. squadrons, and 2 N.E.I. squadrons operating under R.A.A.F. Command in S.W.P.A. In addition there were 2 R.A.F. and 1 N.E.I. transport squadrons. As at the cessation of hostilities in Europe, Australia had provided 15 squadrons in that theatre under the E.A.T.S.

(iv) *Administrative and Operational Control of R.A.A.F.* On 30th April, 1942, operational units of the R.A.A.F. in the South West Pacific area and elements of the 5th (U.S.) Air Force were combined operationally under Lieutenant-General Geo. H. Brett, who was appointed Commanding General of the Allied Air Forces, S.W.P.A.

By agreement with the Commanding General, Allied Air Forces, and effective from 9th September, 1942, R.A.A.F. staff were withdrawn from Allied Air Head-quarters and there was established in Brisbane a R.A.A.F. Command, known as "R.A.A.F. Command, Allied Air Forces".

The function of R.A.A.F. Command was the operational control, under the Commanding General, Allied Air Forces, S.W.P.A., of such R.A.A.F. operational units and other Allied units as from time to time might be assigned to it.

On 26th February, 1944 operational control of R.A.A.F. units in Southern New Guinea (excluding Goodenough and Kiriwina) was placed under R.A.A.F. Command, instead of 5th Air Force as hitherto. This was later extended to cover Northern Areas of New Guinea, Halmaheras and Borneo.

R.A.A.F. Command did not exercise any administrative function in respect of any R.A.A.F. formation or unit, administrative control having been exercised by R.A.A.F. Head-quarters through the various Group and Area Head-quarters. Advanced echelons of R.A.A.F. Head-quarters were established as necessary to maintain administrative contact with General Head-quarters, S.W.P.A.

(v) *Training of Empire Air Training Scheme Personnel.* When the Empire Air Training Scheme was first visualized, it was anticipated that all advanced training would take place in Canada (after elementary training in the respective dominions) with a calculated peak output of 50,000 aircrew annually.

During the Ottawa conference of November, 1939, it was decided that Australia would fully train 7/9ths of her E.A.T.S. personnel, sending the remaining 2/9ths to Canada for advanced training. This was the basis adopted.

Rhodesia was used to relieve Australia's aircrew waiting list before the Australian training was fully under way.

The United Kingdom agreed to contribute to both the Australian and Canadian schemes certain aircraft, spares and similar supplies. The remaining costs in Australia were borne by Australia, which also contributed to the remaining costs of the Canadian scheme, first on a basis of 11.28 per cent. of the total costs and later on a fixed "per capita" charge of 7,000 dollars (£A.1,981) per Australian trainee.

The following figures include all Australians trained to 31st March, 1945 (the date of cessation of the scheme):—

	Intake.	Output.
Australians trained in Australia	(*a*) 40,089 ..	27,387
Australians trained in Canada	10,351 ..	9,606
Australians trained in Rhodesia	674 ..	583

(*a*) Includes 8,604 wastage in Australia and 4,098 aircrew still in training at 31st March, 1945. The total Australian intake to training amounted to 51,114.

The overseas drafts were partially trained in Australia. Pilots for Canada were trained in Australia to Elementary Flying Training School stage, and all other categories (Observers, Wireless Air Gunners, etc.) were trained in Australia to Initial Training School stage.

During the training of Australian aircrew under the E.A.T.S., 316 deaths occurred due to flying accidents. Of these, 231 occurred in Australia, 65 in Canada and 20 in Rhodesia.

(vi) *Peak Strength of Personnel and Strength of Units at End of War.* The highest figures of personnel serving in the R.A.A.F. were reached on 29th November, 1944, when there were 20,691 R.A.A.F. officers, 144,674 airmen, and 657 W.A.A.A.F. officers and 17,800 airwomen—a grand total of 183,822.

Royal Australian Air Force personnel served in every theatre of war in the world with the exception of China. (Catalinas, however, carried out mine-laying operations off the China Coast).

On 1st September, 1945, there were 489 individual units in the R.A.A.F., compared with the original 22 at the outbreak of war.

3. **Zones and Operations.**—(i) *European War.* (*a*) *From Outbreak of War to Fall of France.* At the outbreak of war many Australians were serving with Royal Air Force Squadrons. These were the first Australians to take part in the air war against Germany. Some fought with squadrons of the Advanced Air Striking Force through the Battle of France, some with Fighter Command squadrons, and others with Bomber Command in its bombing offensive against targets in Germany and Norway. In addition to the Australians in Royal Air Force squadrons there were in England at the outbreak of war a few flying boat crews of No. 10 Squadron, R.A.A.F. preparing to take delivery of Sunderland Flying Boats and to fly them to Australia. Other crews arrived at the end of the year. In October, 1939, the Commonwealth Government offered the personnel and aircraft of this Squadron to the United Kingdom Government for service with Coastal Command. This offer was accepted and No. 10 Squadron became the first Dominion squadron to operate against the enemy.

(*b*) *From Fall of France to end of* 1942. Following the fall of France and the entry of Italy into the war in 1940 the land battle was transferred to the Egyptian and Libyan Zone. At the request of the Air Ministry, No. 3 squadron, R.A.A.F. was sent to this theatre for army co-operation duties with the A.I.F. divisions. This squadron later became a fighter squadron.

In April, 1941, the first R.A.A.F. squadron under Article XV. of the Empire Air Training Scheme agreement (No. 452 squadron) was formed in England. It was equipped with Spitfires and fought with Fighter Command. By the end of 1941 seven more Article XV. squadrons were formed. A second Spitfire squadron, No. 457, and a night fighter squadron, No. 456, were formed to augment the resources of Fighter Command for the defence of Britain. Nos. 455 and 460 squadrons were the first R.A.A.F. squadrons to operate with Bomber Command. No. 458 squadron, equipped with Wellingtons, carried out bombing missions with Bomber Command for twelve months before being transferred to the Middle East where, during the year, two fighter squadrons, Nos. 450 and 451, had been formed.

In the United Kingdom five new R.A.A.F. squadrons were formed in 1942. The first of these, No. 461, was equipped with Sunderlands and, with No. 10 squadron, operated with Coastal Command on anti-submarine patrols. No. 455 was transferred from Bomber Command and became a Coastal Command squadron, using Hampden bombers to carry torpedoes against enemy shipping on the coast of Norway. A detachment of this squadron went in August, 1942 to Russia where it carried out convoy escort duty and mapped part of the Arctic Ice Barrier. No. 464 Squadron, armed at first with Venturas and later with Mosquitos, carried out low-level daylight attacks against important pin-point targets.

To increase Bomber Command's growing power all R.A.A.F. squadrons formed in the United Kingdom after 1942 were bomber squadrons. These included Nos. 466 and 467. In 1943 No. 462 squadron, equipped with Halifaxes, was formed in the Middle East. It took part in bombing operations in North Africa and Italy. Number 463 was equipped in the United Kingdom with Lancasters. In the Middle East, two other R.A.A.F. squadrons were added during 1942, No. 454 equipped with Baltimores and No. 459 with Hudsons. Both of these squadrons were engaged in naval co-operation work convoy escort and sea reconnaissance.

(c) *From 1943 to end of War.* In 1943 and the following years R.A.A.F. squadrons operated in many theatres. In the Middle East Nos. 3 and 450 squadrons destroyed enemy aircraft, dive-bombed fortifications to clear the way for the army, and disrupted the enemy's retreat by strafing and bombing motor transport and barges. From Italy these squadrons flew across the Adriatic to assist the Yugoslav partisans by bombing and destroying enemy shipping and concentrations. No. 451 squadron followed the Eighth Army to Tunisia, then went to Corsica to give fighter cover to day bombers operating against Italy and then joined in the invasion of Southern France. No. 454 squadron, in co-operation with the Navy, escorted convoys and destroyed enemy ships and barges. Later, in Italy, as a bomber squadron, it attacked marshalling yards and enemy strong-points. Nos. 458 and 459 squadrons were also on naval co-operation duties. No. 458 moved up to Malta and on to Tunisia escorting convoys and attacking enemy shipping. No. 459 escorted convoys and carried out general reconnaissance tasks and was finally used as a bomber squadron over Italy, Greece and Crete.

In the United Kingdom, Nos. 10 and 461 Squadrons operating with Coastal Command continued their anti-submarine patrols and protected convoys bringing troops and war materials to the invasion armies assembling in Britain. No. 455, re-armed with Beaufighters, continued its attacks with torpedoes, rockets and cannon against enemy shipping in the North Sea and along the Norwegian coast. From 1943 to the end of the war R.A.A.F. Squadrons serving with Bomber Command continued their attacks on strategic targets in Germany and the occupied countries, destroying oil plants, communication centres and power supplies. No. 464 Squadron, its Venturas having been replaced by Mosquitos, became one of the units of the Tactical Air Force on intruder operations, and eventually followed the invasion forces to the continent. In the air defence of Great Britain, Nos. 453 and 456 Squadrons, formerly Fighter Command, continued to represent the R.A.A.F. No. 453 was employed on interception and fighter cover for day bombers proceeding to and from the continent. In 1944 this Squadron, joined later by No. 451, was employed in dive-bombing operations against the launching sites for the enemy's new " V " weapons while No. 456 engaged flying bombs in the air.

(d) *Summary of Operations of Squadrons in United Kingdom at end of War.* Squadrons which were operating in the United Kingdom at the close of the war in Europe had flown a total of 30,981,000 operational miles in 65,841 sorties against the enemy. Their record includes 35 enemy ships or submarines destroyed and 206 probably destroyed or damaged, 109 enemy aircraft destroyed and 238 probably destroyed or damaged, and 24½ flying bombs shot down. R.A.A.F. bombers dropped 59,419 tons of bombs on enemy targets.

(e) *Australian Aircrew in R.A.F. Squadrons.* As yet no mention has been made of the service in every theatre of the War of the many thousands of Australian aircrew who were absorbed directly into R.A.F. Squadrons. During the period May, 1941 to May, 1945 approximately 60 per cent. of all Australian personnel entering R.A.F. Operational Commands served in R.A.F. Squadrons, and since for many reasons the policy for Dominion personnel to serve only in units of their respective Dominions was impossible, there were eventually very few R.A.F. Squadrons which had not had at some time or other Australian aircrew on strength.

These personnel were allocated to every Command—Coastal, Fighter, Bomber, Middle East, Army Co-operation, Transport and Flying Training Commands. In addition, a large number went to the Allied Expeditionary Air Force and the Second Tactical Air Force, and their duties covered the entire range of the manifold tasks of these forces.

Because they were so widely scattered, it is impossible to separate the weight of the effort of the Australian personnel from the vast number of men from all the Dominions who were serving under the same terms. Apart from those operating with the Middle East Command, several thousand aircrew were absorbed in this manner into R.A.F. Operational Squadrons based in England, whilst an additional 1,000 served as instructors under Flying Training Command.

(ii) *War Against Japan.* (*a*) *Malaya and Operations from North-West Australia.* In 1940 Australia's offer of an air contribution to the Malayan Garrison was accepted by the British Government and three squadrons were duly sent to Singapore that year, a further one being added in 1941.

Air Forces in North-Western Australia at the outbreak of war consisted of one General Purpose Squadron located at Darwin. In June, 1940, a Station Head-quarters and an additional squadron were formed and a chain of operational bases was established, providing landing strips, petrol, oil, bombs and ammunition.

In February, 1941, at a conference held at Singapore, the respective spheres of responsibility between the Far East, Netherlands East Indies and Australia were defined. It was also agreed that, in the event of war with Japan, Royal Australian Air Forces would be based in the Netherlands East Indies.

On the outbreak of war with Japan, this agreement was implemented by locating one General Reconnaissance Squadron at Ambon in Ceram, and another at Koepang in Timor. Later, as the weight of the Japanese offensive moved south, a detachment of the Timor Squadron was sent to Namlea in Boeroe to help strengthen the Ceram-Boeroe area.

In mid-January, 1942, operating from bases to the north the Japanese commenced raiding the Ceram-Boeroe group, until finally, towards the end of the month, the approach of a large enemy convoy forced the squadrons to evacuate these bases.

The squadron at Koepang continued operations against the enemy, until a landing in that area became imminent. Towards the end of February this squadron was also withdrawn to Darwin.

The first raid on Darwin occurred on the 19th February, 1942. During 1942, R.A.A.F. strength at Darwin was gradually built up and offensive operations were carried out against enemy bases within striking range. By 1943 medium bombers and long-range fighters were attacking bases and installations in Timor and the Tanimbar Islands, the Kai Islands, the Aroe Islands and on the south coast of Dutch New Guinea. Heavy bombers attacked enemy ports and installations, shipping, and aerodrome installations in Ambon, Ceram, Babo-Kaimana-Monokwari, Sourabaya, Macassar and Batavia, and oil refineries at Balikpapan, Tjpoe and Wonokromo. Allied bomber operations in this zone were at their maximum between June, 1943 and April, 1944. Thereafter bomber operations continued, but on a gradually descending scale of intensity as air forces were transferred to the New Guinea theatre to take part in operations to the north-west directed at the Halmaheras and later at Borneo.

In the course of North-Western Area operations allied aircraft destroyed 133 enemy ships and damaged 218. Allied aircraft also destroyed 484 enemy aircraft and probably destroyed some 90 others; 199 enemy aircraft were damaged. Allied total aircraft losses due to enemy action were 111.

(*b*) *New Guinea.* The main R.A.A.F. effort in the S.W.P.A. was in the New Guinea campaign, which began from Southern Papua and eventually extended over a wide field from Borneo in the West to the Solomons in the East.

At the outbreak of war with Japan there were two R.A.A.F. squadrons in the New Guinea Area. These were flying boat squadrons and their primary role was reconnaissance to provide an outer line of air observation. A composite squadron was soon afterwards sent to Rabaul to provide some measure of local air defence, but the squadron was overwhelmed by intense air attacks which preceded the enemy capture of Rabaul in January, 1942.

The first R.A.A.F. fighter squadron began operations at Port Moresby on 21st March, 1942. So intense was the scale of operations at this time that by 3rd May the squadron was reduced to a total of three aircraft. It had, however, succeeded in destroying 18 enemy aircraft in air combat and a further 17 in ground strafing attacks on Lae aerodrome. Its own losses were 12 pilots and 22 aircraft.

The two flying boat squadrons were withdrawn in May, 1942 to the mainland where they continued their reconnaissance to the north-east from their new base at Bowen, Queensland.

The development of an Allied Air Force base at Milne Bay was begun in June and July, 1942, and two fighter squadrons were established there as an air garrison. These, together with other R.A.A.F. elements in New Guinea, were placed under the operational command of the newly-formed No. 9 Operational Group. The two fighter squadrons, backed by support from air elements at Port Moresby and in co-operation with Australian land forces, contributed largely to the enemy's defeat at, and withdrawal from, Milne Bay.

Supply dropping from the air on a large scale was begun in November, 1942. With this assistance the land forces were able to advance down the northern slopes of the Owen Stanleys. This period marked the first use of R.A.A.F. Attack Squadrons, whose Bostons and Beaufighters began constant harassing attacks on the Japanese lines of communication over the mountains and at their beach-heads in the Buna-Gona area.

During 1943 the Allied air strength steadily increased, enabling direct support to be given to land operations, and the opening of an air offensive against New Britain.

In April, 1943, R.A.A.F. Catalinas began the mining from the air of enemy ports throughout the South-West Pacific Area, a specialized operation which caused the loss of thousands of tons of enemy shipping and supplies, and restricted the use of many harbours. The mining was sustained throughout the remainder of the war, and the Catalinas moved eventually through the Netherlands East Indies and the Philippines to the China Coast.

During the later part of 1943 it became apparent that a mobile task force was needed and in January, 1944 No. 10 Operational Group was therefore formed. The early operations of the group were confined to direct support of the Australian land forces in their drive along the Ramu Valley. During 1944 No. 10 Operational Group took part in the Hollandia, Aitape, Wakde, Biak, Noemfoor, Sansapoor, Amsterdam and Middleburg Island operations, providing fighter cover for the land forces.

Soon after the landing of American land forces at Morotai in September, No. 10 Operational Group was transferred to the operational control of the Commanding General, 13th Air Force, and in October was renamed the 1st Tactical Air Force, R.A.A.F. It then began moving to Morotai where its role became that of destruction of enemy watercraft in the Kai Islands, around Ceram, in the Banda Islands and Maccleur Gulf.

During this period the activities of Northern Command, R.A.A.F. (formerly known as No. 9 Operational Group) were confined to the protection of shipping and the support of the Australian land operations in Wewak and New Britain, and the support in conjunction with the R.N.Z.A.F. of Australian land operations in Bougainville.

Apart from airfield construction the R.A.A.F. took no direct part in the Philippines campaign, which began in October, 1944. The R.A.A.F. Task Force was, like Northern Command, carrying out routine patrols. It did not again come into prominence until the launching of the Borneo campaign in the middle of 1945. Preparation for the operations in Borneo began as early as January, 1945. From that date until the assaults were launched, a large concentration of R.A.A.F. was steadily built up in the Morotai

area. Head-quarters, R.A.A.F. Command, which hitherto had controlled R.A.A.F. operations from Brisbane, moved an advanced head-quarters to Morotai to exercise overall air operational control. The operations involved pre-assault air bombardment and general air support for the successive landings at Tarakan on 1st May, at Brunei on 10th June, and at Balikpapan on 1st July. The air forces available consisted of 1st Tactical Air Force, R.A.A.F., the 13th United States Air Force which was placed under the operational control of Head-quarters R.A.A.F. Command, and heavy bombers of North-Western Area. At this time the 1st Tactical Air Force consisted of two Attack Wings, one General Reconnaissance Bomber Wing, three Fighter Wings and an Army Co-operation Wing. This comprised a total of 26 squadrons. After the Brunei assault two R.A.A.F. Fighter Wings and an Attack Wing were established at Labuan in the Brunei zone and subsequently the Head-quarters of 1st Tactical Air Force also was established there. Balikpapan, when captured, was made the base for a heavy bomber wing and a General Reconnaissance Bomber Wing. Very little enemy air opposition was encountered throughout the Borneo operations and allied aircraft were therefore able to give the greatest possible measure of close air support to the Australian land forces.

(c) *Australia, Burma and India.* From the circle of operational bases established on the Australian mainland squadrons kept ceaseless watch over the important shipping lanes, co-operating with the Royal Australian Navy in protecting merchant ships and military convoys.

Although there were no Australian squadrons in name in the Burma-India theatre there were many R.A.F. squadrons with Australian aircrew serving in them. One R.A.F. squadron with over half its aircrew Australians, having reformed in India after the Malayan campaign, attacked the Japanese in Rangoon, dropped food and equipment to troops and carried out many anti-submarine patrols. A number of R.A.F. squadrons in this theatre were commanded by Australians.

§ 4. Personnel, 1939-45 War.

The figures in the table hereunder represent gross enlistments of war service personnel, plus permanent personnel at the beginning of the war, plus gross enlistments in the permanent forces. Particulars for the Navy and Air Force are as at 31st December, 1945, and for the Army as at 28th February, 1946. The term "gross enlistments" indicates that no deductions have been made because of discharges, dead, deserters, etc.

PERSONNEL, 1939-45 WAR: GROSS ENLISTMENTS, ALL SERVICES.

(Thousands).

Service.	Males.	Females.	Persons
Royal Australian Navy	45.8	3.1	48.9
Australian Military Forces	691.4	35.8	727.2
Royal Australian Air Force	189.7	27.2	216.9
Total	926.9	66.1	993.0

§ 5. Casualties, 1939–45 War.

The following table shows the numbers of persons killed, wounded and missing, and of prisoners-of-war escaped, recovered or repatriated in each of the services, classified according to theatre of operations :—

CASUALTIES (*a*) 1939–45 WAR : ALL SERVICES.

(As at 30th April, 1947.)

Particulars.	Royal Australian Navy.	Australian Military Forces.	Royal Australian Air Force.	All Services.
AGAINST GERMANY.				
Killed (*b*)	913	3,536	7,095	11,544
Missing	..	9	..	9
Prisoners-of-war escaped, recovered or repatriated	26	7,055	1,012	8,093
Wounded and injured	(*c*) 26	8,577	1,601	10,204
Total	965	19,177	9,708	29,850
AGAINST JAPAN.				
Killed (*b*)	1,094	15,140	2,911	19,145
Missing	..	11	33	44
Prisoners-of-war escaped, recovered or repatriated	237	13,865	235	14,337
Wounded and injured	(*c*) 553	13,275	1,630	15,458
Total	1,884	42,291	4,809	48,984
ALL THEATRES OF WAR.				
Killed (*b*)	2,007	(*d*)18,676	10,006	30,689
Missing	..	20	33	53
Prisoners-of-war escaped, recovered or repatriated	263	20,920	1,247	22,430
Wounded and injured	(*c*) 579	(*e*) 21,852	3,231	25,662
Total	2,849	61,468	14,517	78,834

(*a*) All casualties except deaths from natural causes. (*b*) Includes died of wounds, died while prisoner-of-war, and missing, presumed dead. (*c*) Excludes injured. (*d*) Excludes 6,041 non-battle deaths. (*e*) Excludes 149,489 non-battle injuries.

§ 6. Awards and Decorations, 1939-45 War.

The numbers of the various awards and decorations conferred on members of each of the fighting forces for gallantry or other meritorious service during the 1939-45 War appear below :—

AWARDS AND DECORATIONS, 1939-45 WAR : ALL SERVICES.
(As at 31st July, 1946.)

Particulars.	Royal Australian Navy.	Australian Military Forces.	Royal Australian Air Force.	All Services.
Victoria Cross (V.C.)	..	17	4	21
George Cross (G.C.)	4	..	..	4
Knight Grand Cross Order of British Empire (G.B.E.)	..	1	..	1
Knight Commander Order of Bath (K.C.B.)	..	2	..	2
Companion Order of Bath (C.B.)	3	16	6	25
Knight Commander Order of British Empire (K.B.E.)	..	4	..	4
Companion Order of St. Michael and St. George	1	..	..	1
Commander Order of British Empire (C.B.E.)	8	77	22	107
Officer Order of British Empire (O.B.E.)	31	170	60	261
Member Order of British Empire (M.B.E.)	42	203	79	324
Knight of Grace of Order of St. John of Jerusalem	..	3	..	3
Distinguished Service Order (D.S.O.)	19	150	80	249
Distinguished Service Order, Bar	3	16	4	23
Royal Red Cross (R.R.C.)	..	16	3	19
Royal Red Cross (Associate)	..	20	4	24
Distinguished Service Cross (D.S.C.)	149	..	..	149
Distinguished Service Cross, Bar	12	..	..	12
Military Cross (M.C.)	..	458	14	472
Military Cross, Bar	..	14	1	15
Distinguished Flying Cross (D.F.C.)	1	..	2,244	2,245
Distinguished Flying Cross, Bar	..	..	138	138
Air Force Cross (A.F.C.)	..	..	133	133
Albert Medal	1	..	..	1
Medal for Distinguished Conduct in the Field (D.C.M.)	..	187	2	189
Conspicuous Gallantry Medal (C.G.M.)	1	..	11	12
Distinguished Service Medal (D.S.M.)	158	..	..	158
Distinguished Service Medal, Bar	2	..	..	2
Military Medal (M.M.)	..	890	6	896
Military Medal, Bar	..	5	..	5
Distinguished Flying Medal (D.F.M.)	..	..	408	408
Distinguished Flying Medal, Bar	..	..	2	2
Air Force Medal (A.F.M.)	..	..	16	16
George Medal (G.M.)	9	11	20	40
George Medal, Bar	3	..	..	3
British Empire Medal (B.E.M.)	35	94	52	181
King's Commendation	..	8	..	8
Mention in Despatches	598	4,136	1,740	6,474
Commander-in-Chief Cards	..	797	..	797
Commendation Cards	11	177	155	343
Foreign Awards	35	64	50	149
Total	1,126	7,536	5,254	13,916

Foreign awards include those of the United States of America, Russia, Greece, Poland, France, Holland, Belgium and Lebanon.

§ 7. Department of Munitions.

1. **General.**—Information regarding munitions production prior to 1925 will be found in Official Year Book No. 18, pp. 612–616, and reference to munitions supply prior to the outbreak of the 1939–45 War is contained in Official Year Book No. 32, p. 241. A statement covering the events leading to the formation of the Department of Munitions on 11th June, 1940, and outlining the functions of the Department and proposed development of production, was issued as a special publication with restricted issue, but was omitted, for security reasons, from Official Year Book No. 33, 1940.

The following is a summary of the main developments in the production of munitions in Australia since the outbreak of war :—

1939.—Prior to the operation of the Supply and Development Act (June, 1939), the Australian supply of munitions was a function of the Defence Department. The functions of the new Department of Supply and Development covered munitions and also other Australian supplies of war material, and it was especially empowered to establish the production of aircraft.

1940.—The Department of Munitions was created as a distinct authority on 11th June, 1940, but without separate general administrative staff or offices. Under the National Security (Munitions) Regulations promulgated on 15th June, 1940, it was vested with control of munitions production (including aircraft). The Regulations also created the position and defined the powers of the Director-General of Munitions.

1941.—The Departments of Supply and Development (later Supply and Shipping) and of Aircraft Production were established on 26th June, 1941 as separate Departments of State under other Ministers, resulting in the complete administrative separation of the Munitions Department from other Supply (including Aircraft). Construction of factories, building of machine tools, and manufacturing of materials were proceeding, and merchant shipbuilding had been inaugurated. Increasing difficulties were being experienced in the import field.

1942.—The production effort was accelerated following the entry of Japan into the war. The movement for the export of munitions abroad, which had developed throughout 1941, was practically abandoned, but Australian demands increased tremendously, and the advent of the United States Armed Forces initiated still more supply problems.

1943.—The production of munitions was still increasing and it was evident that the manufacturing capacity developed was greater than was estimated when the factories were designed. The nature of the fighting indicated new varieties of requirements, and a food production programme was developing.

1944.—The pressure for production of munitions eased considerably through drastic reductions in sections of the requirements programmes of the Australian Armed Services. On the other hand there were greatly increased demands from the Australian and United States Services for particular requirements, of which small craft and radio supplies are outstanding examples. The pressure was increased in respect of agricultural machinery, automotive spare parts, bolts and nuts, refrigerators, internal combustion engines, and engineering supplies in great variety. The net result was that a large overall production still existed under the control of the Department, although employment had decreased substantially, and in general the all-night shift had been abolished.

1945.—The downward trend continued, and was accelerated with the collapse of Germany. The war with Japan was being prosecuted with vigour, and there were still substantial demands for the American and Australian Forces, as well as increasing demands for the British Armed Forces being based upon Australia. Overall there was a general easing of " Controls " because of the greater availability of supplies, and it was possible to release productive capacity for civilian needs. A result was the relaxation of demands upon commercial industry, and concentration of munitions requirements within the Government factories. Large scale transfers of manpower and materials from munitions production to civilian requirements proceeded throughout the year.

2. **Functions of the Department.**—(i) *Manufacture, Acquisition, Provision, and Supply of Munitions and all matters incidental thereto.* This involved (*a*) operation and management of factories, workshops, and undertakings concerned in the production of

munitions; (*b*) acquisition by the Commonwealth and the establishment of factories and workshops for the purposes of producing munitions; (*c*) securing of supplies of materials, plant, tools and equipment for that purpose; (*d*) employment and training of technicians, workmen and others for that purpose; and (*e*) the control of the nature and extent of the output or production of any person or authority engaged or capable of being engaged in the production of munitions.

The term "munitions" was defined to include armaments, arms, ammunition, weapons, vehicles, machines or aircraft, the materials necessary for the production of the foregoing, and also such things of whatsoever kind as the Minister by order declared to be munitions. Later, vessels and ships were included in the definition, and upon the creation of the Department of Aircraft Production, aircraft were specifically excluded from the definition.

Direction and control of matters referred to in the foregoing were vested in the Director-General of Munitions.

(ii) *Cost and Profit Control.* Powers and functions relating to arrangements for ascertaining costs and for the control and limitation of profits in relation to the production of munitions were delegated by the Minister to the Director of Finance.

3. **Controls of Materials and Finished Articles.**—The following controls of materials and finished articles, the productive capacity necessary for their production, and salvage and scrap recovery of such controlled articles and materials, were exercised by the Department:—Non-ferrous metals (distribution, special refining for munitions purposes, fabrication); ferrous metals; machine tools; factory equipment, transmission equipment, etc.; ball and roller bearings; electrical machinery; electricity supply; engineers' and precision tools, metal and wood machining tools; hand tools and tools of trade; radio and signal parts and requisites; railway locomotives and rolling stock; industrial chemicals (excluding drugs, and excluding coal products used for fuel or roadmaking); industrial chemicals derived from petroleum; timber and timber substitutes (production and use, articles made for munitions purposes, manufacture and distribution of packing cases for primary and secondary industry and of wooden handles for tools of trade); drugs, medical, surgical and veterinary equipment (subject to the requests of the Medical Equipment Control Committee). Woollen and cotton materials and textiles generally (subject to the predominant interest of the Department of Munitions in artillery textiles) were controlled by the Department of Supply and Shipping.

4. **Organization.**—(i) *General.* The Director-General of Munitions was responsible for direction of the productive effort, which included development of means of production, while the Secretary was concerned with policy and its administrative operation.

(ii) *Powers of the Director-General.* Under the National Security (Munitions) Regulations, the Director-General was empowered to (*a*) make and vary contracts or agreements; (*b*) employ such persons as were necessary; (*c*) direct any contractor with the Commonwealth or any person sub-contracting with such a contractor, as to the manner of carrying out the work for which he contracted or sub-contracted; (*d*) requisition or acquire compulsorily any property (other than land) which he thought necessary, including exclusive rights or licences and privileges; (*e*) acquire by purchase any goods or chattels or things in action (including rights in relation to inventions) and (*f*) sell or otherwise dispose of or turn to account property held in connexion with the manufacture or supply of munitions. He was further authorized to direct priorities in respect of munitions production.

The Director-General was also empowered under the Regulations to incur expenditure, without the prior approval of the Minister, to an amount not exceeding £250,000 at any one time, but it was never necessary to exercise the power.

The Director-General delegated to the Board of Factory Administration authority in regard to the direction, control, operation and management of Government Munitions Establishments.

(iii) *Manufacture.* The manufacturing organization built up operated through the following channels :—Commonwealth Government munitions factories, armament and ammunition annexes, and instrumentalities of the States (e.g. railways) and commercial firms.

Prior to the outbreak of war, and in its early months, provision was made to supplement the output of Government factories by the organization of some 25 annexes attached to commercial factories, erected and equipped on the property of the commercial firm, at the cost either to the Government or the firm concerned, or both, and managed and operated by the firm. State instrumentalities, e.g. Railways, were included in the annexe scheme. The number of these annexes (including sub-factories and other commercial works) increased to 244 during the war, and total funds made available for this development were £17,500,000.

(iv) *Cost of Extensions.* Where the manufacturing requirements for munitions, machine tools, etc., were beyond the resources of the commercial firm, Government assistance might be rendered by the issue of materials, provision of plant on a rental basis, or in the form of a cash advance or a bank guarantee.

(v) *Contracts.* In addition to orders placed under the tender system, contracts might be on a fixed price, cost-plus profit, or "target price" basis. In arranging a "target price" contract, a maximum or "target cost" and a fixed margin of profit were agreed upon. The sum was called the "target price". An incentive towards efficient production was a provision that if the contractor was able to produce at less than the target cost, he received, in addition to the actual cost and the agreed profit margin, a proportion of the saving effected.

(vi) *Directorates and Boards of Area Management.* Leading business men were appointed as Production and Finance Directors, and Boards of Area Management, consisting of business men, trade union representatives and senior State public servants, were established in the various States.

The functions of the production directors and of the Boards of Area Management related to production in annexes and in industrial establishments, but not Government factories. Boards of Area Management were responsible for supervising the carrying out of the munitions production programme allotted to a State, and for co-ordinating the State productive effort.

(vii) *Production Orders and Statistics Directorate.* The operations of this directorate involved the receipt and recording of all orders from the Services, initiation of orders on Government factories, as well as on annexes and outside industry, recording of all statistical information, and the noting of trends of production.

Whilst the directorate had specific responsibilities in regard to production, it acted more as a co-ordinating body than as an individual production unit, and consequently its record was not an individual one, but was interwoven with that of the Department as a whole.

(viii) *Finance Directorate.* The functions of this directorate were to approve of the placing of contracts where public invitation of tenders was dispensed with, to arrange contracts with annexes, to obtain information relating to the costs of contracts placed by the Department, to recommend terms and conditions upon which financial assistance might be given to contractors engaged in the production of munitions, and generally to advise on the financial aspect of matters arising in connexion with the work of the Department.

While it is impracticable to enumerate either the variety or number of transactions which passed through the Directorate, it is sufficient to say they covered virtually every aspect of the activities of the Department insofar as such related to work carried out in the annexes, as well as by contractors.

(ix) *Overseas Procurement.* Between 1941 and 1943 the Department was dependent to a certain extent on specialized equipment and materials available only from the United States through "Lend Lease" arrangements. Its requirements were dealt with through the Office for Australian War Supplies Procurement, Washington, which made the necessary representations through the British Supply Mission.

Requirements under Lend Lease had decreased appreciably by early 1944, and concurrently changes were occurring in the scope of Lend Lease eligibility. In general, only consumable goods were being procured by this time, and capital goods, such as machine tools, were available only on cash purchase. These factors resulted in a great decrease in the value of goods acquired under Lend Lease.

A further revision of 1945 requirements was commenced in June, 1944, at the request of the American authorities. This revision was later extended to include the first quarter of 1946, and confined to items required from North America exclusively. At this stage a major change took place, and what had previously been known as the "Lend Lease Mission to Australia" became the "Foreign Economic Administration Mission to Australia". From this point on, items to be programmed were restricted to a selected list of commodities for which the Foreign Economic Administration Mission to Australia was claimant agency.

(x) *Liquidations Branch.* Pending the establishment of a Commonwealth Authority for the direction of all disposals, towards the end of the financial year 1942–43 a Controller of Liquidations was appointed within the Department of Munitions. The position was later designated Liquidations Manager.

Upon the appointment of the Commonwealth Disposals Commission the following disposals machinery was established within the Department of Munitions under the authority delegated by the Commission to the Secretary of that Department.

Disposal of commodities, other than those for which the Directorate of Machine Tools and Gauges was specifically nominated as the disposing agent, was effected under the general authority of the Central Disposals Committee in Melbourne. To save time a Disposals Committee, Eastern District, was set up under the oversight of the Central Disposals Committee to deal with disposals in New South Wales and Queensland, the Central Committee covering South Australia, Western Australia, and Tasmania, as well as Victoria.

The Directorate of Machine Tools and Gauges was made directly responsible for the disposal of machine tools and allied equipment, hand tools, ball and roller bearings, and electric motors and control equipment.

The central agencies for the processing of disposals are the Liquidations Branch, functioning under the Central Disposals Committee, and the Directorate of Machine Tools and Gauges, through which agencies disposals in Victoria are also processed.

Surpluses in other States are disposed of through the Controller of Munitions in the State concerned under the authority of the Liquidations Manager or the Director of Machine Tools and Gauges.

The total amount realized from disposals of surplus Munitions property during the two years ended 30th June, 1945 was £3,740,441.

5. **Departmental Administration (May, 1946)**—With the relinquishment of his appointment by the Director-General of Munitions on 31st May, 1945, the functions performed by him were assumed by the Minister for Munitions, and the form of departmental administration customary in peace-time was reverted to. The Secretary of the Department, as its Permanent Head, became responsible for its general administration, and the Assistant Director-General reverted to his pre-war appointment as Controller-General of Munitions Supply. The Directorate of Finance was amalgamated with the Finance Branch of the Department under the Assistant Secretary (Finance). The Directorate of Technical Practice was terminated, and the Directorate of Locomotive and Rolling Stock Contruction was amalgamated with the Directorate of Small Craft Construction. The Directorates and Controls continuing were:—Gun Ammunition Production, Ordnance Production, Explosives Supply, Radio and Signal Supplies, Small Craft Construction, Machine Tools and Gauges, Materials Supply, Stores and Transport, Production Orders and Statistics, Labour, Electricity Supply, and Timber. Timber Control ceased as a Munitions function in October, 1945.

With the re-organization of the Department on 31st May, 1945, the Boards of Area Management relinquished their appointments, and their functions were transferred more or less to departmental officials with the designation "State Controller of Munitions".

6. **Lands, Buildings and Works.**—The Controller of Lands, Buildings and Works was responsible for the investigation of sites and land acquisition, co-ordination of the buildings and works programme, and the supervision of works construction by commercial industry at Government expense.

The statement following is a summary of projects covering Government Munitions Factories and Establishments, Bulk Stores, Explosives Depots, Sidings, etc., in respect of which construction requisitions were issued through the Controller's office from 30th June, 1939 to 30th June, 1945 :—

GOVERNMENT MUNITIONS FACTORIES AND ESTABLISHMENTS, BULK STORES, EXPLOSIVES DEPOTS, SIDINGS, ETC.,—CONSTRUCTION CARRIED OUT 30TH JUNE, 1939 TO 30TH JUNE, 1945.(a)

State.	Number of Projects.	Area.	Expenditure Authorized.	Number of Buildings.	Roads.	Railways.	Tramways.
		Acres.	£'000.		Chains.	Chains.	Chains.
New South Wales ..	27	6,972	12,276	1,402	2,901	2,064	859
Victoria	21	4,266	6,509	1,160	2,372	309	652
Queensland ..	4	455	1,192	163	197	56	..
South Australia ..	11	5,397	7,579	1,499	2,602	1,626	1,212
Western Australia	3	140	349	69	111	9	..
Tasmania ..	2	33	410	31	109	15	..
Total ..	68	17,263	28,315	4,324	8,292	4,079	2,723

(a) Excludes armament annexes and additions to commercial establishments financed by the Government and under the control of the various Directorates of the Department of Munitions.

7. **Factory Equipment Section.**—This section commenced operations in July, 1940, and was responsible for the production and procurement of heavy machine tools and manufacturing equipment. The task necessitated the organization of engineering firms ordinarily engaged in building rough, heavy plant for mining and steel industries, structural engineering, etc., for the production of heavy but high grade precision equipment. Operations covered practically the whole of Australia, including not only the capital cities, but points as far distant as Kalgoorlie, Western Australia, and Mackay, Queensland.

All States co-operated in the construction of large new plant for additions to the Ammunition Factory, Footscray, as well as complete ammunition factory plant and equipment for Finsbury, South Australia, Rutherford, New South Wales, Rocklea, Queensland, and Derwent Park, Tasmania. Production of small arms was assisted by the manufacture of gauges, jigs, and fixtures for general development of this type of work. The design and manufacture of medium and heavy machine tools for ordnance were carried out by distributing the manufacture of components over all States.

For the production of aircraft, two hydraulic blanking and forming presses of 3,000 tons capacity were designed and manufactured complete with pumps and electrical equipment, also one 600,000-lb. testing machine and large plywood hot press. Machines designed and manufactured for the Captain Cook Graving Dock, Sydney, included 200-ton and 600-ton hydraulic flanging presses. Six large special milling machines were designed and manufactured for machining cruiser tank hulls in one setting, as well as four boring and facing machines for transmission.

About 160 overhead travelling 3-motor electric travelling cranes were made for ammunition and ordnance factories, munitions stores and annexes. Capacity ranged from 5 to 75 tons. Five 80-ton floating cranes were also designed and manufactured, two being supplied to the British Admiralty and three to the United States Armed Forces in the Pacific Operational Area.

Complete rolling mills and equipment were made for the aluminium fabrication factory at Wangaratta, Victoria, and special foundations, etc., for a 35,000-lb. drop-hammer for the forging annexe at Granville, New South Wales, controlled by the Australian Aluminium Co. Pty. Ltd. Over 12,000 items of earth-moving equipment were produced for the Allied Works Council, including 1,300 bulldozers, 1,700 scrapers, 2,200 power control units, 1,500 mobile cranes, 1,100 winches, and lesser quantities of numerous other types of equipment. Production of railway equipment included 300 complete 3 ft. 6 in. gauge wagons, 200 underframes, 1,000 sets of wheels and axles, and over 900 sets of Westinghouse brake equipment.

8. **Munitions Output.**—The following is a statement of production of the principal items of munitions from 1st June, 1940 to 30th June, 1945.

It has been impossible to include, from considerations of space, full details of all equipment produced. In addition to the items of munitions proper, a large programme of agricultural and food processing equipment was met—in the two years ended 30th June, 1945 approximately 348,000 units of agricultural implements were produced.

MUNITIONS OUTPUT—PRINCIPAL ITEMS PRODUCED FROM 1ST JUNE, 1940 TO 30TH JUNE, 1945.

Item.	Production.	Item.	Production.
Ammunition—	Rounds.	Engineering Equipment—*cont'd.*	Number.
Small Arms	1,845,000,000	Cookers	1,747
Light Anti-Aircraft	3,784,695	Box Girder Bridges	143
Heavy Anti-Aircraft	575,222	Engines	35,906
Light Artillery	1,521,411	"Barblock" Wire (concertinas)	511,621
Medium Artillery	8,021,850	Trailers	11,387
Heavy Artillery	131,725		Sq. yds.
	Number.	Fabric Mesh	3,975,600
Mortar Bombs	3,993,011	Armoured Fighting Vehicles—	Number.
Grenades	5,521,594	Carriers, Machine Gun, etc.	5,583
Aircraft Bombs—Practice	1,840,719	Armoured Cars—Light	237
Aircraft Bombs—Service	147,718	Tanks, 30-ton	65
Mines—Naval	12,336	Refrigeration—	Units.
Land	750,098	Field (up to 10 c. ft.)	10,146
Weapons—		Medium (up to 30 c. ft.)	987
Sub-Machine Guns—Austen	19,914	Heavy (up to 20,000 c. ft.)	8,216
Owen	45,433	Radio Equipment—	
Bren Guns and Mountings	17,336	Radio Transmitters	12,280
Vickers Guns and Mountings	11,316	Radio Receivers	9,204
Rifles	408,650	Transmitter Receivers	18,469
Signal Pistols	25,392	Radar Equipment—	
Mortars, 2", 3" and 4.2"	5,306	R.A.A.F. Land bases air warning equipment	201
Hispano and Polsten Cannon, 20 mm.	1,864	R.A.A.F. Air-borne Equipment for location of surface vessels and homing purposes	1,126
Bofors Guns, 40 mm.	290	R.A.A.F. Radar Beacons for use on Aerodromes	224
Anti-Aircraft Guns, 3" and 3.7"	512	Naval Sea-borne ship-warning and aircraft-warning equipments	374
Tank Attack Guns—2-pdr.	1,580	Army Radar Controller Searchlights	65
6-pdr.	900	Army Radar Portable Beach Watching and Coastal Defence Sets	49
17-pdr.	326	Army Coastal Artillery and Shore Defence Equipment	37
25-Pdr. Guns	1,912	General Radar Test Equipment	9,085
4" Naval Guns	266	Signal Equipment—	
Optical Instruments—		Telephones	100,000
Telescopes	1,172	Switchboards	9,000
Directors	639	Steel Poles	150,000
Clinometers	9,078	Test Equipments	16,200
Compasses	55,756	Small Craft—	
Electrical Equipment—		Powered Vessels	1,675
Projectors and Searchlights	1,490	Non-Powered Vessels	4,049
Generating and Charging Sets	10,973	Pontoons, Life Rafts, etc.	21,917
Signalling Lamps	34,710		
Cable Layers	29,919		
	Miles.		
Field Cable	199,612		
Engineering Equipment—	Number.		
Winches	3,574		
Pumps	3,989		
Air Compressors	2,176		
Portable Filters	1,369		

9. **Government Munitions Factories and Establishments.**—(i) *Administration.* The Commonwealth Government munitions factories and establishments are administered by the Board of Factory Administration, whose functions are defined by Administration Regulations (Statutory Rule No. 97 of 1939). The constitution of the Board includes the Controller-General of Munitions Supply, who acts as Chairman, five officers of the Department, a Consultant on Explosives, and a Secretary.

(ii) *Factories and Establishments.* The munitions production effort in Australia was developed upon the Government factories and establishments, which prior to the war consisted of the Ammunition Factory, Footscray, Victoria (until 1921, Colonial Ammunition Co. Ltd.), which commenced operations in 1888, and—with year of commencement in parenthesis—the Explosives Factory, Maribyrnong, Victoria (1911); the Ordnance Factory, Maribyrnong, Victoria (1925); the Small Arms Factory, Lithgow, New South Wales (1912); and the Munitions Laboratories, Maribyrnong, Victoria (preceded by Defence Laboratory 1907–1920) (1921). The capital investment in these establishments on 30th June, 1938 was £1,253,617 in land and buildings, and £1,721,672 in plant.

In the years immediately preceding 1939 a moderate programme of expansion of these factories was being developed, and new units for production of naval cordite and small arms ammunition were authorized, the amount allocated being £2,500,000. During the first year of the war an additional £3,000,000 was authorized for extensions to the Government factories and establishments, including an additional small arms ammunition factory at a site selected subsequently at Hendon, South Australia. From April, 1940 until the close of hostilities, a further £49,000,000 was allocated for expansion of the original establishments and construction of new ones.

The urgent need for weapons and ammunition impelled concentration upon the establishment of large scale production units during the earlier period of war-time development. Because of labour requirements these were located near large cities, but later, attention was directed to the utilization of the resources and manpower available in the smaller towns. As the first outcome of this policy of decentralization—the institution of " feeder " factories at Bathurst and Orange, New South Wales, in association with the parent Small Arms Factory at Lithgow—proved successful a wider dispersal of production units was sought throughout the various States.

Consideration was given in the case of gun ammunition factories to the locality where the empty components would be filled with the explosive. The factories in Victoria, for instance, were placed between the filling factories at Maribyrnong, Victoria, and Salisbury, South Australia, so that if one or other of these places was bombed, the empty components could be shipped to the alternative establishment.

The gunpaper factory was placed in Ballarat, Victoria, mainly because of the pure water supply there, but also because it had to be located on the Adelaide–Melbourne line in order to feed both the Victorian and South Australian factories.

The explosives factory at Mulwala, Victoria is excellently situated because of the water supply in the Murray, and because it can feed alternatively the Victorian and New South Wales explosives and filling factories. The ordnance factory was placed at Bendigo, Victoria, because it had to be close to the Melbourne Ordnance Factory for technical management reasons, and so that it could draw the heavy forgings from the Melbourne Ordnance Factory or from the forging annexe at Castlemaine. The factory at Echuca, Victoria was supplied with raw materials from Bendigo, and is within a reasonable distance of that centre.

By June, 1943, the peak of munitions activity, 47 factories had been authorized to be established, operated directly by the Department under the administrative direction of the Board of Factory Administration, but two (located at Swan Hill, Victoria, and Katoomba, New South Wales) were never completely equipped. The following is a

list of the 45 which operated, together with the Drawing Office and ancillary Stores and Transport Branches, showing peak capital valuations disclosed in annual balance-sheets to 30th June, 1945 :—

GOVERNMENT MUNITIONS FACTORIES AND ESTABLISHMENTS—PEAK CAPITAL VALUATIONS TO 30TH JUNE, 1945.

Establishment.	Land.	Buildings and Works.	Plant and Equipment.	Total.
New South Wales.	£	£	£	£
Ammunition Factories—				
Rutherford	17,553	731,813	1,036,123	1,785,489
Goulburn	719	108,752	252,628	362,099
Albury	3,860	35,088	56,469	95,417
Wagga Wagga	971	43,369	59,997	104,337
Broken Hill	..	64,669	73,428	138,097
Tamworth	612	35,444	44,166	80,222
Hay	8,970	15,533	26,249	50,752
Explosives and Filling Factories—				
St. Mary's	33,085	4,430,903	897,885	5,361,873
Villawood	34,506	1,393,696	919,199	2,347,401
Mulwala	702	1,915,396	1,531,688	3,447,786
Small Arms Factories—				
Lithgow	7,212	857,362	2,419,873	3,284,447
Bathurst	100	201,061	304,111	505,272
Orange	4,367	335,209	602,261	941,837
Forbes	6,004	39,266	23,049	68,319
Wellington	1,850	19,274	22,022	43,146
Mudgee	429	13,936	1,082	15,447
Cowra	..	2,025	3,380	5,405
Young	1,640	31,621	530	33,791
Dubbo	..	26,460	713	27,173
Parkes	1,086	23,305	702	25,093
Portland	482	41,572	42,410	84,464
Stores and Transport Branches—				
Sydney	2,484	837,658	264,126	1,104,268
Oaklands	2,701	339,106	36,981	378,788
Sub-Total	129,333	11,542,518	8,619,072	20,290,923
Victoria.				
Ammunition Factories—				
Footscray	17,849	1,027,166	2,561,046	3,606,061
Mildura	..	..	38,508	38,508
Explosives and Filling Factories—				
Maribyrnong	49,289	1,732,838	1,688,809	3,470,936
Ballarat	6,669	316,088	873,389	1,196,146
Ordnance Factories—				
Maribyrnong	5,956	1,179,286	3,721,623	4,906,865
Bendigo	19,187	622,550	1,707,729	2,349,466
Echuca	2,031	102,101	181,832	285,964
Horsham	1,531	22,628	51,674	75,833
Stawell	210	22,617	536	23,363
Hamilton	750	15,409	17,132	33,291
Laboratories and Chemical Defence Factory, Maribyrnong	144	242,305	402,224	644,673
Central Drawing Office, Maribyrnong	930	51,788	26,270	78,988
Stores and Transport Branch	31,931	850,450	399,178	1,281,559
Sub-Total	136,477	6,185,226	11,669,950	17,991,653
Queensland.				
Ammunition Factory, Rocklea	6,975	737,716	1,103,657	1,848,348
Stores and Transport Branch	..	51,931	13,495	65,426
Sub-Total	6,975	789,647	1,117,152	1,913,774
South Australia.				
Ammunition Factories—				
Finsbury	22,023	1,026,148	2,660,953	3,709,124
Hendon	5,126	267,157	461,180	733,463
Port Pirie	..	32,694	153,348	186,042
Clare	..	3,195	33,026	36,221
Kapunda	..	4,373	14,559	18,932
Moonta	..	4,225	16,648	20,873
Mt. Gambier	..	3,435	25,600	29,035
Murray Bridge	..	6,656	29,395	36,051
Explosives and Filling Factory, Salisbury	49,932	5,071,464	2,069,219	7,190,615
Stores and Transport Branch	33,631	587,737	64,662	686,030
Sub-Total	110,712	7,007,084	5,528,590	12,646,386

GOVERNMENT MUNITIONS FACTORIES AND ESTABLISHMENTS—PEAK CAPITAL VALUATIONS TO 30TH JUNE, 1945—*continued.*

Establishment.	Land.	Buildings and Works.	Plant and Equipment.	Total.
Western Australia.	£	£	£	£
Ammunition Factories—				
Welshpool..	9,016	267,680	360,934	637,630
Kalgoorlie..	7	17,232	57,135	74,374
Stores and Transport Branch	656	54,809	23,175	78,640
Sub-Total	9,679	339,721	441,244	790,644
Tasmania.				
Ammunition Factory, Derwent Park	8,728	344,519	589,135	942,382
Stores and Transport Branch	1,106	34,106	6,862	42,074
Sub-Total	9,834	378,625	595,997	984,456
Total	403,010	26,242,821	27,972,005	54,617,836

The number of factories in operation in each State on 30th June of each of the years 1939 to 1945 was as follows:—

GOVERNMENT MUNITIONS FACTORIES IN OPERATION.

State.	At 30th June—						
	1939.	1940.	1941.	1942.	1943.	1944.	1945.
New South Wales..	1	1	1	5	18	16	8
Victoria.. ..	4	4	4	6	7	8	7
Queensland ..	..	..	..	1	1	..	..
South Australia ..	..	..	2	3	4	9	6
Western Australia	..	..	..	1	1	2	2
Tasmania ..	..	..	..	1	1	1	..
Total ..	5	5	7	17	32	36	23

(iii) *Production.* Apart from the large share taken in the production of guns and the metal components of gun ammunition, the Government factories were the sole producers of rifles and machine guns (except the Owen sub-machine gun), small arms ammunition, explosives, brass cartridge cases for gun ammunition, and the sole units engaged in the filling and assembling of gun ammunition.

(iv) *Munitions Supply Laboratories—(a) General.* Established at Maribyrnong, Victoria, the laboratories carry out—or supervise the carrying out by approved test houses of—the specification laboratory tests on all munitions produced in Government and private factories, as submitted to the Inspection Branches of Navy, Army and Air for sentence before being passed to those Services.

Other functions are to assist Government factories, annexes, and departmental contractors with advice in the development of manufacture, and to be responsible for the maintenance of accuracy of instruments of various classes used to control manufacture.

Apparatus and equipment installed is valued at more than £400,000. The establishment is divided into specialist laboratory sections as described hereunder.

(*b*) *Metrology.* This section is responsible for the maintenance of standards of length for the manufacture of munitions in Australia. The basic standards are two one-yard end bars, the lengths of which have been certified by the National Physical Laboratory, England, to an accuracy of one part in a million.

(c) *Engineering.* Mechanical tests on a wide range of material are conducted by this section, the machines installed being suitable for testing metals, rubber, leather, timber, glues and cements, plastics, wire, wire rope and cordage, as well as articles such as springs, both coiled and plate, insulators, welded joints and completed fittings. Equipment is also held for a variety of miscellaneous tests, such as calibration of pressure gauges.

(d) *Physics.* The laboratories are equipped for investigational and testing work in optics, electronics, electricity and magnetism, heat and thermometry, and other branches of general physics. Work performed includes testing of materials and components such as optical glass, lenses, aircraft cables, insulating materials and resistors, and of instruments such as optical, electrical and thermometry apparatus.

There are three experimental workshops, namely, the precision machining, fitting and optical adjustment shop, the fine instrument shop and the glass-working shop, which are primarily devoted to the construction and servicing of industrial and scientific equipment and instruments.

(e) *Metallurgy.* The Metallurgy Section is equipped to deal with both the ferrous and non-ferrous branches of secondary metallurgy. There is a full range of equipment for the study of the hardness and microstructure of metals, studies which are fundamental to casting, mechanical working and heat-treatment operations.

(f) *General Chemistry.* The chemical aspects of all materials other than explosives, metals, and materials used in chemical warfare, are dealt with in this section. The range includes lubricants of all types used in industry, fuels, rubber materials, leather, clothing materials, textiles and papers, aviation fabrics and parachute silks, aircraft dopes and lacquers, and paints and varnishes for a wide variety of purposes.

(g) *Explosives and Ammunition.* The section is equipped for a wide range of specialized tests on explosives and pyrotechnic stores, and on the raw materials used in their manufacture.

(h) *Chemical Defence.* The Chemical Defence Section is concerned with chemical warfare from both the defensive and offensive points of view, and has laboratory facilities for both chemical and physical investigations.

(i) *Timber.* Several small kilns are operated by the section for seasoning and conditioning work, and it carries out specification tests on timbers, glues and cements used in Defence stores.

(j) *Technical Information.* This is the scientific information centre of the Department, its resources including a library of technical books and journals on related scientific subjects.

(k) *Approved Test House.* Approximately 150 test houses, scattered thorughout the Commonwealth, and designed to carry out specified types of testing work, were investigated and approved over the war years, so as to relieve the pressure upon the central establishment.

(v) *Chemical Defence Board.* This is an inter-Services body on which the three fighting Services and the Department are represented, the President being the Controller-General of Munitions, and the Secretary to the Board the Controller of Chemical Defence. The Board acts as a co-ordinating and advisory body on matters concerning chemical warfare, and controls investigational work on the subject.

(vi) *Stores and Transport Directorate.*—(a) *General.* The Directorate controlled the warehousing and movement by rail, road or sea of munitions materials and products, as well as the storage and movement of materials and products for other Commonwealth Government departments.

(b) *Stores.* In 1940 the Stores and Transport organization controlled an area of 22 acres at Maribyrnong, Victoria on which were erected two bulk stores of 40,000 square feet each, and a third bulk store of 50,000 square feet was under construction on the area. In addition, there was 50,000 square feet of hired accommodation. At the peak of munitions production, in 1943, the Directorate controlled 4,750,000 square feet of Government and hired covered storage space, while 350 acres of open land were hired for open storage.

Large magazine depots were established at Smithfield, South Australia; St. Mary's, New South Wales; and Longlea, Victoria. These depots, together with the original Derrimut depot, covered 4,800 acres, and provided accommodation for 15,000 tons of explosives.

A special explosives rail siding at Deer Park, Victoria, completed a comprehensive constructional programme for the storage of goods.

At the peak of munitions production the Government storage accommodation in Australia comprised 650 buildings, erected on 6,500 acres, and provided 3,632,690 square feet of covered storage accommodation distributed amongst the States as follows:—New South Wales, 1,474,710 square feet; Victoria, 1,068,760 square feet; Queensland, 115,600 square feet; South Australia, 848,500 square feet; Western Australia, 77,120 square feet; and Tasmania, 48,000 square feet. There was capacity for the storage of 15,045 tons of explosives distributed as follows: New South Wales, 3,302; Victoria, 7,193; South Australia, 4,400; and Western Australia, 150 tons.

The hired accommodation comprised 300 private stores, which were hired under National Security Regulations.

(c) *Transport.*—From 64 road vehicles operating in 1940 the plant increased to 1,182 at the peak, comprising 149 horse and 1,033 motor units. The largest increase was in 1942, when 630 motor vehicles were purchased.

On 30th June, 1945, the directorate throughout Australia operated 878 motor vehicles, 252 trailers, 60 horse-drawn vehicles, 58 horses, 60 mobile cranes and Fork trucks from one to twenty tons capacity.

This fleet travelled approximately 25,000,000 miles, and hauled over 8,000,000 tons of munitions, materials, and products.

(vii) *Value of Munitions Production.* The following figures of value of output of the Government munitions establishments cover not only production connected with the fulfilment of Service orders for munitions, but also the manufacture of equipment such as tools and gauges for use within the factories, as well as work performed on capital account, e.g., manufacture of machine tools, plant installation costs, and minor construction work. As far as the Munitions Supply Laboratories are concerned, the figures cover expenditure connected with the scientific functions of the establishments, as well as costs of production of respirators, and repair, reconditioning and servicing of instruments.

VALUE OF OUTPUT OF GOVERNMENT MUNITIONS FACTORIES FROM 1st JULY, 1939 TO 30th JUNE, 1945.

(Subject to revision.)

Year.	Ammunition.	Explosives.	Ordnance.	Small Arms.	Munitions Laboratories.	Total.
	£	£	£	£	£	£
1939–40	1,501,494	729,046	846,999	404,154	192,895	3,674,588
1940–41	4,193,072	1,897,082	2,031,936	1,526,073	494,632	10,142,795
1941–42	9,008,730	5,554,303	3,940,818	3,020,051	860,904	22,384,806
1942–43	12,078,796	9,600,959	5,246,283	5,435,689	903,296	33,265,023
1943–44	8,118,014	7,563,661	4,371,837	4,974,295	536,196	25,564,003
1944–45	4,681,833	3,871,091	1,805,292	3,287,698	52,911	13,698,825
Total	39,581,939	29,216,142	18,243,165	18,647,960	3,040,834	108,730,040

(viii) *Employment.* Employment in administrative sections of the Munitions Department, and at munitions factories and establishments at the 30th June, 1939 to 1945 was as follows. The figures for Administrative Offices cover staffs of the Central Administration and Directorates in all States, and the staffs of the Boards of Area

Management. The administrative staffs of the Government Factories are included with the wages personnel under the appropriate production heading. The table illustrates the entry of female labour into the Government Munitions Factories, and shows the extension of the Government Factories into the rural areas.

EMPLOYMENT IN ADMINISTRATIVE SECTIONS OF DEPARTMENT OF MUNITIONS AND AT MUNITIONS FACTORIES AND ESTABLISHMENTS.

Particulars.	At 30th June—						
	1939.	1940.	1941.	1942.	1943.	1944.	1945.
MALES.							
ADMINISTRATIVE OFFICES.							
Australian Capital Territory	..	3	3	5	5	..	..
New South Wales	..	..	229	663	922	947	888
Victoria	12	196	700	1,302	1,962	1,377	1,142
Queensland	..	..	10	32	68	91	91
South Australia	..	..	30	66	101	94	82
Western Australia	..	..	7	32	50	51	40
Tasmania	..	..	1	7	10	13	9
Total	12	199	980	2,107	3,118	2,573	2,252
MUNITIONS FACTORIES AND ESTABLISHMENTS.							
New South Wales.							
Metropolitan—							
Explosives and Filling Factories—							
St. Marys	..	..	..	..	703	844	889
Villawood	..	..	..	..	223	192	70
Stores and Transport Branch	..	..	29	213	579	633	559
Total Metropolitan	..	..	29	213	1,505	1,669	1,518
Country—							
Ammunition Factories—							
Rutherford	..	..	..	86	408	362	32
Goulburn	..	..	..	13	127	103	197
Albury	..	..	..	10	72	3	..
Wagga Wagga	..	..	..	8	81	2	..
Broken Hill	..	..	..	..	43	62	58
Tamworth	..	..	..	..	32	..	..
Hay	..	..	..	..	..	18	..
Explosives Factory, Mulwala	..	..	..	..	277	316	201
Small Arms Factories—							
Lithgow	532	1,961	4,044	4,437	3,517	2,063	1,552
Bathurst	..	..	..	1,264	1,000	395	331
Orange	..	..	..	1,251	1,344	580	490
Forbes	..	..	..	146	139	80	..
Wellington	..	..	..	..	152	74	..
Mudgee	..	..	..	79	133	49	..
Cowra	..	..	..	..	74	43	..
Young	..	..	..	..	94	..	..
Dubbo	..	..	..	..	73	33	..
Parkes	..	..	..	..	75	75	..
Portland	..	..	..	..	..	118	66
Stores and Transport Branch, Oaklands	..	..	..	..	52	65	64
Total Country	532	1,961	4,044	7,294	7,693	4,441	2,991
Total New South Wales	532	1,961	4,073	7,507	9,198	6,110	4,509
Victoria.							
Metropolitan—							
Ammunition Factory, Footscray	1,429	3,523	5,252	4,722	3,101	1,758	1,514
Explosives and Filling Factory, Maribyrnong	1,071	1,926	3,764	4,935	3,003	1,772	1,358
Ordnance and Projectile Factory, Maribyrnong	1,157	2,400	3,555	4,964	4,817	3,235	2,835
Laboratories and Respirator Assembly, Maribyrnong	175	318	542	772	584	550	509
Central Drawing Office, Maribyrnong	65	82	131	180	172	127	111
Stores and Transport Branch	52	105	252	830	1,231	927	811
Total Metropolitan	3,949	8,354	13,496	16,403	12,908	8,369	7,138

EMPLOYMENT IN ADMINISTRATIVE SECTIONS OF DEPARTMENT OF MUNITIONS AND AT MUNITIONS FACTORIES AND ESTABLISHMENTS —*continued.*

Particulars.	At 30th June—						
	1939.	1940.	1941.	1942.	1943.	1944.	1945.
MALES—*continued.*							
MUNITIONS FACTORIES AND ESTABLISHMENTS—*continued.*							
Victoria—continued.							
Country—							
Ammunition Factory, Mildura	..	..	..	..	22	20	..
Explosives Factory, Ballarat	..	..	..	577	524	191	73
Ordnance, Projectile and Ball Bearings Factories—							
Bendigo	..	..	..	156	936	713	647
Echuca	..	..	..	..	..	66	112
Horsham	..	..	..	..	..	71	82
Stawell	..	..	..	..	..	(*a*)	..
Hamilton	..	..	..	..	..	15	..
Total Country	..	..	..	733	1,482	1,076	914
Total Victoria	3,949	8,354	13,496	17,136	14,390	9,445	8,052
Queensland.							
Metropolitan—							
Ammunition Factory, Rocklea	..	..	..	842	1,054	4	..
Stores and Transport Branch	..	..	4	25	37	48	50
Total Queensland	..	..	4	867	1,091	52	50
South Australia.							
Metropolitan—							
Ammunition Factories—							
Finsbury	..	..	797	3,897	2,555	1,262	1,063
Hendon	..	..	575	783	691	416	261
Explosives and Filling Factory, Salisbury	..	..	..	1,269	2,546	1,205	895
Stores and Transport Branch	..	..	30	240	401	398	324
Total Metropolitan	..	..	1,402	6,189	6,193	3,281	2,543
Country—							
Ammunition Factories—							
Port Pirie	..	..	..	..	168	120	65
Clare	..	..	..	..	..	24	18
Kapunda	..	..	..	..	..	14	..
Moonta	..	..	..	..	..	24	20
Mount Gambier	..	..	..	..	..	24	..
Murray Bridge	..	..	..	..	..	27	..
Total Country	..	..	..	..	168	233	103
Total South Australia	..	..	1,402	6,189	6,361	3,514	2,646
Western Australia.							
Metropolitan—							
Ammunition Factory, Welshpool	..	..	..	59	656	814	610
Stores and Transport Branch	..	..	1	29	56	72	79
Total Metropolitan	..	..	1	88	712	886	689
Country—							
Ammunition Factory, Kalgoorlie	..	..	..	..	12	69	48
Total Western Australia	..	..	1	88	724	955	737
Tasmania.							
Metropolitan—							
Ammunition Factory, Derwent Park	..	..	..	186	427	278	82
Stores and Transport Branch	..	..	..	..	19	14	11
Total Tasmania	..	..	..	186	446	292	93

(*a*) Ceased before June, 1944.

EMPLOYMENT IN ADMINISTRATIVE SECTIONS OF DEPARTMENT OF MUNITIONS AND AT MUNITIONS FACTORIES AND ESTABLISHMENTS —*continued.*

Particulars.	At 30th June—						
	1939.	1940.	1941.	1942.	1943.	1944.	1945.
MALES—*continued.*							
MUNITIONS FACTORIES AND ESTABLISHMENTS—*continued.*							
GRAND TOTALS—							
Administrative Offices ..	12	199	980	2,107	3,118	2,573	2,252
Munitions Factories and Establishments—							
Metropolitan	3,949	8,354	14,932	23,946	22,855	14,549	12,031
Country	532	1,961	4,044	8,027	9,355	5,819	4,056
Total	4,481	10,315	18,976	31,973	32,210	20,368	16,087
TOTAL MALES—AUSTRALIA	4,493	10,514	19,956	34,080	35,328	22,941	18,339
FEMALES.							
ADMINISTRATIVE OFFICES.							
Australian Capital Territory ..	..	2	2	4	6	..	..
New South Wales	..	..	82	404	807	921	812
Victoria	6	92	389	1,109	2,099	1,723	1,396
Queensland	..	..	4	13	48	63	55
South Australia	..	..	12	68	101	110	84
Western Australia	..	..	4	12	42	45	41
Tasmania	..	..	..	7	12	18	15
Total	6	94	493	1,617	3,115	2,880	2,403
New South Wales.							
Metropolitan—							
Explosives and Filling Factories—							
St. Marys	..	..	..	..	1,220	1,268	1,165
Villawood	..	..	..	..	64	105	15
Stores and Transport Branch ..	..	..	3	29	195	207	198
Total Metropolitan ..	..	..	3	29	1,479	1,580	1,378
Country—							
Ammunition Factories—							
Rutherford	..	..	..	25	302	297	23
Goulburn	..	..	..	4	126	145	185
Albury	..	..	..	2	199	2	..
Wagga Wagga	..	..	..	4	172	3	..
Broken Hill	..	..	..	..	189	226	194
Tamworth	..	..	..	..	51	..	..
Hay	..	..	..	..	..	63	..
Explosives Factory, Mulwala ..	..	..	..	..	33	89	33
Small Arms Factories—							
Lithgow	4	30	54	621	1,963	687	117
Bathurst	..	..	..	336	576	306	165
Orange	..	..	..	88	1,012	431	273
Forbes	..	..	..	85	117	68	..
Wellington	..	..	..	..	216	98	..
Mudgee	..	..	..	106	167	33	..
Cowra	..	..	..	..	172	41	..
Young	..	..	..	..	174	..	..
Dubbo	..	..	..	..	55	3	..
Parkes	..	..	..	..	52	13	..
Portland	..	..	..	..	..	71	2
Stores and Transport Branch, Oaklands	..	..	..	..	6	5	2
Total Country ..	4	30	54	1,271	5,582	2,581	994
Total New South Wales	4	30	57	1,300	7,061	4,161	2,372

EMPLOYMENT IN ADMINISTRATIVE SECTIONS OF DEPARTMENT OF MUNITIONS AND AT MUNITIONS FACTORIES AND ESTABLISHMENTS —*continued.*

Particulars.	At 30th June—						
	1939.	1940.	1941.	1942.	1943.	1944.	1945.
FEMALES—*continued.*							
MUNITIONS FACTORIES AND ESTABLISHMENTS.							
Victoria.							
Metropolitan—							
Ammunition Factory, Footscray	487	1,409	2,523	4,589	2,757	1,076	709
Explosives and Filling Factory, Maribyrnong	15	46	1,113	3,197	2,390	1,324	943
Ordnance and Projectile Factory, Maribyrnong	28	70	173	535	1,157	712	570
Laboratories and Respirator Assembly, Maribyrnong	17	48	365	480	572	450	366
Central Drawing Office, Maribyrnong	21	32	43	78	88	83	63
Stores and Transport Branch	2	7	21	96	268	210	133
Total Metropolitan	570	1,612	4,238	8,975	7,232	3,855	2,784
Country—							
Ammunition Factory, Mildura	..	..	..	..	14	46	..
Explosives Factory, Ballarat	..	..	..	49	152	34	16
Ordnance, Projectile and Ball Bearings Factories—							
Bendigo	..	..	..	55	247	214	141
Echuca	..	..	..	..	..	14	25
Horsham	..	..	..	..	..	9	1
Stawell	..	..	..	..	..	(*a*)	..
Hamilton	..	..	..	..	..	7	..
Total Country	..	..	..	104	413	324	183
Total Victoria	570	1,612	4,238	9,079	7,645	4,179	2,967
Queensland.							
Metropolitan—							
Ammunition Factory, Rocklea	..	..	..	840	1,492	5	..
Stores and Transport Branch	..	..	1	3	5	7	9
Total Queensland	..	..	1	843	1,497	12	9
South Australia.							
Metropolitan—							
Ammunition Factories—							
Finsbury	..	..	29	1,449	237	352	332
Hendon	..	..	1,428	1,929	1,810	779	296
Explosives and Filling Factory, Salisbury	..	..	..	1,512	2,465	986	924
Stores and Transport Branch	..	..	3	46	127	129	71
Total Metropolitan	..	..	1,460	4,936	4,639	2,246	1,623
Country—							
Ammunition Factories—							
Port Pirie	..	..	..	..	150	78	48
Clare	..	..	..	..	..	21	17
Kapunda	..	..	..	..	..	14	..
Moonta	..	..	..	..	..	14	18
Mount Gambier	..	..	..	..	..	30	..
Murray Bridge	..	..	..	..	..	19	..
Total Country	..	..	..	..	150	176	83
Total South Australia	..	..	1,460	4,936	4,789	2,422	1,706
Western Australia.							
Metropolitan—							
Ammunition Factory, Welshpool	..	..	..	58	1,244	892	522
Stores and Transport Branch	..	..	..	3	12	13	19
Total Metropolitan	..	..	..	61	1,256	905	541

(*a*) Ceased before June, 1944.

EMPLOYMENT IN ADMINISTRATIVE SECTIONS OF DEPARTMENT OF MUNITIONS AND AT MUNITIONS FACTORIES AND ESTABLISHMENTS —*continued.*

Particulars.	At 30th June—						
	1939.	1940.	1941.	1942.	1943.	1944.	1945.
FEMALES—*continued.*							
MUNITIONS FACTORIES AND ESTABLISHMENTS—*continued.*							
Western Australia—continued.							
Country—							
Ammunition Factory, Kalgoorlie	..	..	..	..	2	111	44
Total Western Australia	..	..	..	61	1,258	1,016	585
Tasmania.							
Metropolitan—							
Ammunition Factory, Derwent Park	..	..	..	26	291	241	15
Stores and Transport Branch	..	..	..	..	7	4	2
Total Tasmania	..	..	..	26	298	245	17
GRAND TOTALS—							
Administrative Offices	6	94	493	1,617	3,115	2,880	2,403
Munitions Factories and Establishments—							
Metropolitan	570	1,612	5,702	14,870	16,401	8,843	6,352
Country	4	30	54	1,375	6,147	3,192	1,304
Total	574	1,642	5,756	16,245	22,548	12,035	7,656
TOTAL FEMALES—AUSTRALIA	580	1,736	6,249	17,862	25,663	14,915	10,059
PERSONS.							
ADMINISTRATIVE OFFICES.							
Australian Capital Territory	..	5	5	9	11	..	..
New South Wales	..	..	311	1,067	1,729	1,868	1,700
Victoria	18	288	1,089	2,411	4,061	3,100	2,538
Queensland	..	..	14	45	116	154	146
South Australia	..	..	42	134	202	204	166
Western Australia	..	..	11	44	92	96	81
Tasmania	..	..	1	14	22	31	24
Total	18	293	1,473	3,724	6,233	5,453	4,655
MUNITIONS FACTORIES AND ESTABLISHMENTS.							
New South Wales.							
Metropolitan—							
Explosives and Filling Factories—							
St. Marys	..	..	..	..	1,923	2,112	2,054
Villawood	..	..	..	..	287	297	85
Stores and Transport Branch	..	..	32	242	774	840	757
Total Metropolitan	..	..	32	242	2,984	3,249	2,896
Country—							
Ammunition Factories—							
Rutherford	..	..	..	111	710	659	55
Goulburn	..	..	..	17	253	248	382
Albury	..	..	..	12	271	5	..
Wagga Wagga	..	..	..	12	253	5	..
Broken Hill	..	..	..	..	232	288	252
Tamworth	..	..	..	..	83	..	..
Hay	..	..	..	..	..	81	..
Explosives Factory, Mulwala	..	..	..	..	310	405	234

EMPLOYMENT IN ADMINISTRATIVE SECTIONS OF DEPARTMENT OF MUNITIONS AND AT MUNITIONS FACTORIES AND ESTABLISHMENTS —*continued.*

Particulars.	At 30th June—						
	1939.	1940.	1941.	1942.	1943.	1944.	1945.
PERSONS—*continued.*							
MUNITIONS FACTORIES AND ESTABLISHMENTS— *continued.*							
New South Wales—continued.							
Country—*continued.*							
Small Arms Factories—							
Lithgow	536	1,991	4,098	5,058	5,480	2,750	1,669
Bathurst	..	..	..	1,600	1,576	701	496
Orange	..	..	..	1,339	2,356	1,011	763
Forbes	..	..	..	231	256	148	..
Wellington	..	..	..	..	368	172	..
Mudgee	..	..	..	185	300	82	..
Cowra	..	..	..	..	246	84	..
Young	..	..	..	..	263	..	..
Dubbo	..	..	..	..	128	36	..
Parkes	..	..	..	..	127	88	..
Portland	..	..	..	..	..	189	68
Stores and Transport Branch, Oaklands	..	..	..	..	58	70	66
Total Country	536	1,991	4,098	8,565	13,275	7,022	3,985
Total New South Wales	536	1,991	4,130	8,807	16,259	10,271	6,881
Victoria.							
Metropolitan—							
Ammunition Factory, Footscray	1,916	4,932	7,775	9,311	5,858	2,834	2,223
Explosives and Filling Factory, Maribyrnong	1,086	1,972	4,877	8,132	5,393	3,096	2,301
Ordnance and Projectile Factory, Maribyrnong	1,185	2,470	3,728	5,499	5,974	3,947	3,405
Laboratories and Respirator Assembly, Maribyrnong	192	366	907	1,252	1,156	1,000	875
Central Drawing Office, Maribyrnong	86	114	174	258	260	210	174
Stores and Transport Branch	54	112	273	926	1,499	1,137	944
Total Metropolitan	4,519	9,966	17,734	25,378	20,140	12,224	9,922
Country—							
Ammunition Factory, Mildura	..	..	..	..	36	66	..
Explosives Factory, Ballarat	..	..	..	626	676	225	89
Ordnance, Projectile and Ball Bearings Factories—							
Bendigo	..	..	..	211	1,183	927	788
Echuca	..	..	..	..	..	80	137
Horsham	..	..	..	..	..	80	83
Stawell	..	..	..	..	..	(a)	..
Hamilton	..	..	..	..	..	22	..
Total Country	..	..	..	837	1,895	1,400	1,097
Total Victoria	4,519	9,966	17,734	26,215	22,035	13,624	11,019
Queensland.							
Metropolitan—							
Ammunition Factory, Rocklea	..	..	..	1,682	2,546	9	..
Stores and Transport Branch	..	..	5	28	42	55	59
Total Queensland	..	..	5	1,710	2,588	64	59
South Australia.							
Metropolitan—							
Ammunition Factories—							
Finsbury	..	..	826	5,346	2,792	1,614	1,395
Hendon	..	..	2,003	2,712	2,501	1,195	557
Explosives and Filling Factory, Salisbury	..	..	..	2,781	5,011	2,191	1,819
Stores and Transport Branch	..	..	33	286	528	527	395
Total Metropolitan	..	..	2,862	11,125	10,832	5,527	4,166

(*a*) Ceased before June, 1944.

EMPLOYMENT IN ADMINISTRATIVE SECTIONS OF DEPARTMENT OF MUNITIONS AND AT MUNITIONS FACTORIES AND ESTABLISHMENTS —*continued.*

Particulars.	At 30th June—						
	1939.	1940.	1941.	1942.	1943.	1944.	1945.
PERSONS—*continued.*							
MUNITIONS FACTORIES AND ESTABLISHMENTS—*continued.*							
South Australia—continued.							
Country—							
Ammunition Factories—							
Port Pirie	..	..	..	..	318	198	113
Clare	..	..	..	..	..	45	35
Kapunda	..	..	..	..	..	28	..
Moonta	..	..	..	..	..	38	38
Mount Gambier	..	..	..	..	..	54	..
Murray Bridge	..	..	..	..	..	46	..
Total Country	..	..	..	..	318	409	186
Total South Australia	..	..	2,862	11,125	11,150	5,936	4,352
Western Australia.							
Metropolitan—							
Ammunition Factory, Welshpool	..	..	..	117	1,900	1,706	1,132
Stores and Transport Branch	..	..	1	32	68	85	98
Total Metropolitan	..	..	1	149	1,968	1,791	1,230
Country—							
Ammunition Factory, Kalgoorlie	..	..	..	..	14	180	92
Total Western Australia	..	..	1	149	1,982	1,971	1,322
Tasmania.							
Metropolitan—							
Ammunition Factory, Derwent Park	..	..	..	212	718	519	97
Stores and Transport Branch	..	..	..	..	26	18	13
Total Tasmania	..	..	..	212	744	537	110
GRAND TOTALS—							
Administrative Offices	..	18	293	1,473	3,724	6,233	5,453	4,655
Munitions Factories and Establishments—							
Metropolitan	..	4,519	9,966	20,634	38,816	39,256	23,392	18,383
Country	..	536	1,991	4,098	9,402	15,502	9,011	5,360
Total	..	5,055	11,957	24,732	48,218	54,758	32,403	23,743
TOTAL PERSONS—AUSTRALIA		5,073	12,250	26,205	51,942	60,991	37,856	28,398

(ix) *Salaries, Wages, and Like Payments.* The importance of the Munitions effort in respect of public income is demonstrated by the following statement of payments :—

Particulars.	1939–40.	1940–41.	1941–42.	1942–43.	1943–44.	1944–45.
	£	£	£	£	£	£
Munitions Administration	67,402	160,705	817,211	1,725,626	1,953,774	1,707,721
Government Munitions Factories and Establishments	2,073,007	5,780,385	11,676,397	17,470,114	14,827,086	8,632,992
Technical Training Scheme	26,928	635,944	753,884	529,237	83,458	56,695
Total	2,167,337	6,577,034	13,247,492	19,724,977	16,864,318	10,397,408

Details of the abovementioned figures for Government Munitions Factories and Establishments are given in the following table :—

SALARIES, WAGES AND LIKE PAYMENTS, GOVERNMENT MUNITIONS FACTORIES AND ESTABLISHMENTS.(a)

Particulars.	1939–40.	1940–41.	1941–42.	1942–43.	1943–44.	1944–45.
	£	£	£	£	£	£
Ammunition Factories—						
New South Wales ..	..	..	10,005	230,837	508,371	284,142
Victoria	831,911	1,933,955	2,517,236	2,385,482	1,301,363	779,275
Queensland	..	50	214,525	558,653	191,065	1,779
South Australia	..	233,558	1,750,735	1,767,234	1,758,690	742,988
Western Australia ..	..	..	16,632	289,237	532,247	409,369
Tasmania	..	..	11,355	148,082	248,224	94,284
Total	831,911	2,167,563	4,520,488	5,379,525	4,539,960	2,311,837
Explosives Factories—						
New South Wales ..	..	..	97	198,119	872,544	736,390
Victoria	358,215	989,660	2,134,075	2,732,170	1,420,094	875,309
South Australia	..	..	217,533	1,532,902	1,065,711	541,854
Total	358,215	989,660	2,351,705	4,463,191	3,358,349	2,153,553
Ordnance, Projectile and Ball Bearings Factories—						
Victoria	420,107	1,162,085	1,885,405	2,738,314	2,390,669	1,653,459
Small Arms Factories—						
New South Wales ..	322,651	1,169,894	2,230,255	3,594,039	3,138,017	1,348,327
Laboratories and Respirator Assembly—						
Victoria	78,683	177,044	315,504	388,123	337,439	275,898
Central Drawing Office—						
Victoria	32,752	46,991	69,720	75,312	72,196	60,063
Stores and Transport—						
New South Wales ..	..	4,069	38,113	162,393	322,830	287,194
Victoria	28,688	58,646	202,176	493,945	456,924	359,426
South Australia	..	4,327	53,303	138,847	156,456	127,305
Other States	..	106	9,728	36,425	54,246	55,930
Total	28,688	67,148	303,320	831,610	990,456	829,855
All Factories and Establishments—						
New South Wales	322,651	1,173,963	2,278,470	4,185,388	4,841,762	2,656,053
Victoria	1,750,356	4,368,381	7,124,116	8,813,346	5,978,685	4,003,430
Queensland	..	156	220,070	571,173	212,216	19,671
South Australia	..	237,885	2,021,571	3,438,983	2,980,857	1,412,147
Western Australia	..	..	20,815	307,795	557,871	441,941
Tasmania	..	..	11,355	153,429	255,695	99,750
Total	2,073,007	5,780,385	11,676,397	17,470,114	14,827,086	8,632,992

(a) Excludes those shown under Administrative Offices in the table beginning on page 1018.

10. **State Boards of Area Management.**—Boards of Area Management, organized upon a State basis, and comprising leading business men, trade union representatives, and senior public officials, were appointed to supervise the carrying out of the munitions production allotted to each State, to co-ordinate State productive effort, and to administer ammunition and armament annexes (but not Government factories).

The Boards of Area Management in each State, wherever possible, utilized large industrial organizations not only as manufacturers, but also as centres for "farming out" components to small manufacturers organized in groups for feeding the large establishment.

The following table gives approximate figures of employment in annexes.

EMPLOYMENT IN MUNITIONS ANNEXES.
(APPROXIMATE.)

At 30th June—	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Total.
MALES.							
1940	1,210	470	..	515	..	..	2,195
1941	3,622	2,668	43	1,587	..	..	7,920
1942	6,567	5,264	410	2,337	257	220	15,055
1943	5,887	4,528	675	1,905	471	419	13,885
1944	2,749	2,319	515	1,032	552	317	7,484
1945	1,756	1,346	455	652	352	214	4,775
FEMALES.							
1940	58	12	..	31	..	..	101
1941	425	181	36	108	..	..	750
1942	1,026	1,156	228	561	2	106	3,079
1943	1,661	1,898	357	946	251	275	5,388
1944	821	879	187	186	265	172	2,510
1945	298	339	75	87	129	120	1,048
PERSONS.							
1940	1,268	482	..	546	..	..	2,296
1941	4,047	2,849	79	1,695	..	..	8,670
1942	7,593	6,420	638	2,898	259	326	18,134
1943	7,548	6,426	1,032	2,851	722	694	19,273
1944	3,570	3,198	702	1,218	817	489	9,994
1945	2,054	1,685	530	739	481	334	5,823

11. **Production Directorates.**—(i) *General.* Following the appointment of the Director-General in June, 1940, eight directorates were established for the development of commercial industry for the production of certain groups of munitions, or in some cases of matters accessory thereto. The number of directorates and associated authorities was increased to a total of sixteen at the peak of production. Of this number twelve were still functioning on 30th June, 1945.

A brief description of the principal functions of these directorates follows.

(ii) *Gun Ammunition Production.*—This directorate came into being in May, 1940, when arrangements had already been made by the Defence Supply Planning Committee for the creation of 21 annexes, to be operated by "parent" firms and organizations, such as the State railway systems. During the war period the number of annexes and other major production units organized by the Directorate increased to 94. Of these, 20 continued in production on 30th June, 1945, and 9 others which had ceased production had been approved for retention as a potential. Action for liquidation of the remainder had either been taken or was in course.

Main items produced at the annexes and by contractors, together with their approximate numbers, were as follows:—Bombs, aircraft, 20,000; bombs, practice, 955,000; bombs, mortar, 2,404,000; fuzes, 5,257,000; fuzes, mine contact, 799,000; mines, contact A.T., 1,042,000; mines, naval, 7,600; primers, 4,842,000; shell, 5,144,000; and shot, 193,000.

Late in 1942 the production of spark plugs came within the jurisdiction of the directorate, and, shortly after, the co-ordination of manufacture of automotive spare parts was undertaken in conjunction with the Department of Supply and Shipping. Until the end of November, 1945, when co-ordination ceased, many millions of individual items, including types previously imported, were produced for the Services and for essential civilian transport.

The complete programme of bright bolt and nut production, which also came within the jurisdiction of the directorate, called for over 14,000,000 bolts and 20,000,000 nuts of various dimensions and diameters, production being shared between certain Government factories, annexes and contractors.

During August, 1943, refrigeration unit production was placed under this directorate and between then and 30th June, 1945, equipment to the value of approximately £2,000,000 was produced for the Australian and Allied Services.

(iii) *Explosives Supply.* Created in 1940, the directorate was composed largely of technical men, chemists and engineers, whose numbers ultimately reached a maximum of 190. Its objectives were the manufacture of high explosives, propellants and initiators, and the filling of all ammunition and pyrotechnic stores, etc., required by the fighting services.

Efforts of the directorate culminated in the creation of the following five complete factories: Explosives Factory, Ballarat, Victoria—manufacturing gunpaper and ammonium nitrate; Explosives and Filling Factory, Salisbury, South Australia—manufacturing cordite, T.N.T., tetryl, ammonium nitrate, lead azide, lead styphnate, and filling shell, bombs, grenades, caps, detonators, fuzes, depth charges (including cartridge bundling and cartridge assembly), and various pyrotechnics; Explosives Factory, Villawood, New South Wales—manufacturing T.N.T., tetryl and ammonium nitrate; Filling Factory, St. Mary's, New South Wales—filling shell, bombs, land mines, aircraft ammunition, fuzes, primers, gaines (including cartridge bundling and cartridge assembly), and various pyrotechnics; and Explosives Factory, Mulwala, New South Wales—manufacturing nitrocellulose and nitrocellulose powder propellant (American type).

The erection of four complete plants to synthesize ammonia from atmospheric nitrogen, and to oxidize the ammonia to nitric acid, was undertaken in 1941. This project, which makes Australia independent of imported Chilean nitrate of soda, the raw material for nitric acid, was carried out in conjunction with Imperial Chemical Industries of Australia and New Zealand Ltd., and plants were erected at the explosives factories at Albion and Ballarat in Victoria and at Villawood and Mulwala in New South Wales.

The total expenditure involved in erecting and equipping all factories and projects was approximately £22,000,000.

Work of the directorate also included training of technical personnel for duties at the various factories, procurement of the latest technical data (involving visits overseas by technical officers), and liaison with other Departments and commercial firms in Australia.

(iv) *Ordnance Production.* The function of this directorate was to create and maintain production of various kinds of equipment required by the Fighting Services. Value of the programme undertaken was approximately £72,000,000, of which equipment valued at £65,000,000 had been produced, delivered and accepted by the Forces by 30th June, 1945. Maximum monthly production achieved was £1,740,000, and the maximum annual production £21,000,000.

Orders were executed on behalf of the Australian Army, Navy, and Air Force and many other Commonwealth Departments, as well as New Zealand, England, India, the Dutch East Indies, United States of America, Ceylon and Hong Kong.

Over the five years of its operations, the directorate undertook a total of 913 projects of which 147 of a specialized nature were transferred to other production directorates or agencies upon the latter being formed. All of the remainder reached the production stage, work having been completed on 517 of them by the 30th June, 1945.

Among the types of production controlled by the directorate were guns and gun parts of various types, bridging equipment, mobile laundries, cookers, engineers' stores, electric generator sets, trailers, tyre retreading equipment, electric cable, and more than 300 types of agricultural machinery.

New industries created included the manufacture of rubber covered cables of all types; carbons and brushes for arc lights and searchlights, twelve different types of optical glass, and the design and production of instruments of many types demanding high mechanical and optical precision.

Supervision of agricultural machinery manufacture became a responsibility of the directorate in June, 1943, and the approved requirements covered all types of vegetable-growing equipment; tillage implements; seed drills and cultivators; fertilizer distributors; hay-making equipment; harvesting machines; potato planters and diggers; dairy farm, poultry farm, and pastoral equipment; windmills and pump jacks; spraying and dusting equipment for orchards and vegetables; irrigation plants; cane cultivating equipment; and many miscellaneous types of machinery. The total number of pieces of agricultural equipment produced was 348,000.

Under the guidance of the directorate many shops which in peace-time worked on a jobbing basis were re-organized and re-equipped to enable them to take care of quantity production. Numbers of small factories were expanded, and industry as a whole assisted to manufacture entirely different types of products.

(v) *Armoured Fighting Vehicles.* The organization operated from December, 1940 to October, 1943, commencing as a section of the Ordnance Production Directorate, and being constituted as a separate directorate in August, 1941. It controlled the design and production of armoured fighting vehicles suitable to Australian conditions. Construction included cruiser tanks, machine gun and anti-tank gun carriers, mortar carriers, armoured scout cars, and light and heavy armoured cars, as well as modifications to certain types of tanks, and the manufacture of spare parts.

Changing conditions in the Pacific war theatre, and increased availablity of large quantities of modern armoured vehicles from the United States of America, led to a revision of the production programme, and in the early part of the second half of 1943, after a total of 65 had been completed, the construction of further cruiser tanks was suspended.

On 15th October, 1943, the Ordnance Production Directorate assumed responsibility for the remaining activities of this directorate, such as production of machine gun carrier spares and modifications to United States type tanks and other armoured vehicles.

(vi) *Machine Tools and Gauges.* The directorate, formed in May, 1940, has controlled the production, reconditioning, acquisition, disposal and distribution of machine tools, ball bearings, electrical equipment, gauges, factory equipment, transmission gears, and hand tools.

At the peak of war production there were 200 firms employing 12,000 persons for an annual production of 14,000 machines, as against 6 firms employing 700 persons for an annual production of 2,000 machines before 1939.

Allocations and delivery of machine tools, including those locally produced to departmental order, local purchases, and departmental importations from overseas, were as follows: Royal Navy, 441; Royal Australian Navy, 3,001; Australian Army, 9,447; Royal Australian Air Force, 6,059; British Army in Egypt, 421; United States Forces in Australia, 4,837; Indian Government and Eastern Group Supply Council, 161; [6]New Zealand Government, 508; South African Government, 92; Netherlands East Indies, 466; Aircraft Production Department, 8,737; Labour and National Service Department (for technical training), 768; Department of Interior (for Allied Works Council, Commonwealth Railways and other Government Departments), 2,187; and Department of Munitions—Government Factories, 7,316; Gun Ammunition Annexes, 3,935; Ordnance Production Annexes, 800; Ordnance Production Contractors, 3,955; Armoured Fighting Vehicles Workshops and Annexes, 1,240; Shipbuilding Annexes and Small Craft Directorate, 1,600; Radio and Signal Supplies, 462; Munitions Stores Depots, 4,050; Commercial Industry Sales, 6,487; Commercial Industry Loans, 12,815; Total, 79,785 to 30th June, 1945.

Approximately £9,000,000 was spent upon tool and gauge manufacture, the number of plants in this sphere increasing from three in 1939 to 188 in 1943.

(vii) *Locomotive and Rolling Stock Construction.* Following a War Cabinet Minute dated 12th August, 1942, this directorate was created to undertake the construction of Garratt locomotives and flat top waggons for the Australian 3 ft. 6 in. gauge railways. A further responsibility was the collation of all Lend-Lease orders for railway equipment and material.

The organization for the carrying out of the building programme embraced the whole of the Commonwealth, orders covering locomotive construction being distributed among 105 firms, while 94 firms co-operated in the building of 1,000 waggons, which project had been completed by 30th June, 1944. To 30th June, 1945, 53 locomotives had been constructed.

(viii) *Radio and Signal Supplies.* Established in July, 1942, the directorate organized and controlled production in commercial industry of radar equipment, radio frequency communication equipment, and non-radio signal equipment, in order to meet the requirements of the various Service ordering authorities.

A total of 274 projects were handled for the three years ended 30th June, 1945, the value of equipment delivered being £15,578,000, details of which are as follows : Field wireless equipment for the Army (including United States Forces) valued at £3,914,000, comprising portable stations, £1,388,000, fixed stations, £1,740,000, and mobile stations, £786,000; radio equipment for the Navy (including United States Forces) valued at £698,000, comprising shore stations, £305,000, and shipboard stations, £393,000; radio equipment for the Royal Australian Air Force to the value of £2,651,000, comprising ground stations, £1,629,000 and aircraft, £1,022,000; sundry special equipment for all Services for special Service amenities, etc., £1,431,000; radar equipment valued at £2,019,000, comprising ground and ship stations, £1,286,000, airborne, £403,000, and test equipment, £330,000; line signal equipment, £2,821,000; telephone equipment, £1,459,000; and general and sundry equipment, £585,000.

(ix) *Small Craft Construction.* This directorate commenced operations in October, 1943, when the small craft construction programme of the Australian Shipbuilding Board was transferred to its control. (Details of the work already carried out by the Board are given in paragraph 12 (iv).)

Existing boat builders in the metropolitan areas and scattered along the eastern coast were first called upon, and new establishments were constructed by the Government. Motor car manufacturers, builders and contractors, furniture and sporting goods manufacturers and engineering companies were utilized later.

As well as the 127 contractors in all States occupied in hull building and fitting out of vessels, 764 contractors were engaged directly in the production of components.

One of the problems associated with the provision of auxiliary marine craft in the numbers required was the supply of engines for self-propelled craft. Before the war, the manufacture of high horse-power compression ignition engines had not been attempted in Australia, Diesel engines of only relatively small horse-power having been produced. As overseas supplies of engines for marine craft could not be assured, arrangements were made to include in the programme the local manufacture of six-cylinder Ruston-Hornsby 200 h.p. low speed marine Diesels and gear boxes and six-cylinder Gray 165 h.p. high speed marine Diesels and gear boxes.

The Ruston-Hornsby project was commenced at the end of December, 1943, and by June, 1945, 70 engines and gear boxes had been completed, besides a large proportion of components for a further 80 engines and gear boxes. In view of the urgent requirement, converted General-Motors Diesel engines were used in the Gray project, but by June, 1945, the complete Gray engine was in production.

Up to 30th June, 1945, a total of 27,641 craft had been handed over, as follows :—United States Army Services of Supply, 21,065; Australian Army, 6,051; Royal Australian Navy, 226; Royal Australian Air Force, 287; Royal Navy, 5; and miscellaneous; 7. Types comprised 584 powered steel craft; 1,158 unpowered steel craft; 1,090 powered wood craft; 2,144 unpowered wood craft; 14,389 pontoons; 8,276 lifeboats, dinghies, and miscellaneous craft.

The estimated total value of the completed programme was £25,000,000.

(x) *Materials Supply.* (a) *Reserves of Materials.* The primary function of this directorate was the bulk purchase and distribution of reserves of materials required by all munitions factories and annexes for the production programme. These purchases covered not only production materials, but also those for maintenance and consumable stores. Up to 30th June, 1945, purchases totalling £48,000,000 were made from the following sources of supply :—£24,000,000 locally, £14,000,000 from United Kingdom,

£7,500,000 from United States of America, £1,500,000 from India, and £1,000,000 from Canada. Materials making up this amount were chemicals, £17,500,000; metals, £22,500,000; textiles, paper and boards, £2,000,000; radio and signal supplies, £2,000,000; and miscellaneous, £4,000,000. Purchases of comparatively minor amount were also made from other allied and neutral countries.

(*b*) *Annexes.* Eighteen annexes were placed under the directorate, their activities being concerned with castings, forgings, aluminium fabrication, re-melting of secondary aluminium, die-casting alloy, magnesium powder and nickel matte.

(*c*) *Controls.* Under the Control of Essential Materials Order, issued in pursuance of Regulation 59 (National Security Regulations), the directorate controlled the usage of iron and steel, non-ferrous metals, industrial chemicals and certain other items. Approximately 600 items were subject to direct control, and written applications dealt with annually averaged 600,000.

(*d*) *New Manufacture and Expansion of Industry.* There was a substantial development or increase in production of 44 ferrous items, 36 non-ferrous, 9 insulated wires and cables, 103 industrial chemicals, and many miscellaneous types, representing for the most part permanent additions to secondary industry.

(*e*) *Supply Certificates and Overseas Sponsoring.* Approximately 70,000 applications by importers or exporters for the import or export of controlled materials were sponsored through the agency of the directorate, and in addition 30,000 applications were sponsored by priority cables or letters to the controlling authorities overseas.

(*f*) *Disposal of Surplus Materials.* With the depression of the munitions programme, a detailed review was carried out with respect to all reserve stocks of materials. Up to 30th June, 1945, reserves declared surplus to requirements were valued at over £6,133,000. Recommendations for sale concerning these to the value of £3,371,000 were forwarded to the Controller of Liquidations.

(*g*) *Salvage.* This section was responsible for supervising the establishment and functions of salvage sections organized in all Government factories and annexes. Up to 30th June, 1945 proceeds from the disposal of surplus scrap materials exceeded £1,000,000, while very considerable quantities were also re-utilized in the munitions programme.

12. **Australian Shipbuilding Board.**—(i) *General.* Commercial shipbuilding in Australia was practically non-existent prior to 1914, and during the next four years only a few wooden ships for use in the coastal trade were constructed. From 1919 to 1924, 19 cargo steamers, each approximately 3,350 tons gross, and 2 cargo steamers, each approximately 9,700 tons gross, were built in Australian shipyards. Between 1924 and 1941 shipbuilding was confined to Naval vessels of various types, vessels required by Government Departments, and vessels under 500 tons.

The Australian Shipbuilding Board was created on 26th March, 1941.

The Board, which was directly responsible to the Minister and Director-General of Munitions, consisted of a Chairman, the Director of Shipbuilding, a person appointed on the nomination of the Naval Board, a public accountant, known as the "Finance Member", a person representative of the employees engaged on shipbuilding, and any other person whose appointment might be considered necessary by the Minister.

It was first necessary to explore the existing facilities in order to determine the yards most suitable to enable shipbuilding to be undertaken on the scale required. Following an exhaustive survey, the Government decided, upon the Board's recommendation, that financial assistance be provided to the following contractors to enable them to expand their facilities to meet requirements:—Mort's Dock & Engineering Co. Ltd., Sydney; Melbourne Harbour Trust Commissioners, Williamstown (now H.M.A. Naval Dockyard); and Evans Deakin & Co. Ltd., Brisbane. Facilities were also provided on Cockatoo Island, Sydney, which is Commonwealth property leased to the Cockatoo Docks and Engineering Co. Pty. Ltd. The Broken Hill Pty. Co. Ltd. shipyard at Whyalla, South Australia, was built at the Company's own expense. Arrangements were made between the Commonwealth and the State for expansion of the facilities at the New South Wales Government Engineering and Shipbuilding Undertaking, Newcastle.

(ii) *Construction Programme.* The original scheme envisaged a long range programme of 60 " A " class 9,000-ton standard merchant ships based on a production of 12 ships per annum, but owing to the outbreak of war with Japan and the consequent unprecedented volume of ship repair work, this rate of production was not possible.

It was finally decided to embark upon the undermentioned programme :—13 " A " Class 9,000-ton standard merchant ships, 10 " B " Class 6,000-ton freighters, 10 " C " Class 4,000-ton freighters, 10 " D " Class 2,500-ton freighters, 10 " E " Class 550-ton freighters, thirty-two 300-ton wooden merchant ships, 3 " A " type ocean-going tugs, 3 " B " type harbour tugs, and a 1,000-ton steel floating dock.

At 31st December, 1945, the following work had been carried out on this programme :—Ten " A " Class vessels were completed and in service, and of the other three the completion dates were in sight ; orders had been placed for the construction of four " B " class vessels, and fabrication was proceeding ; no orders had been placed for "C " class vessels ; orders had been placed for ten " D " class vessels, and construction was under way ; five " E " class freighters had been ordered, and fabrication was under way ; out of the total of thirty-two 300-ton wooden cargo vessels 22 had been delivered to Army, while another 5 were under construction ; fabrication of the three " A " type ocean-going tugs was under way, but further work was suspended ; work upon the three " B " type harbour tugs had not commenced, and the project had been suspended ; and construction of the 1,000-ton steel floating dock was nearing completion.

(iii) *Ship Repair Facilities.* (*a*) *General.* The opening of hostilities with Japan created an extraordinary demand on the ship repair facilities of the Commonwealth, so that it early became necessary to co-ordinate and control Allied Navy, Army and mercantile marine requirements in accordance with the plant and equipment available. By arrangement with the Department of the Navy a Controller of Ship Repairs was appointed.

Notwithstanding the facilities provided, it was found impossible for the shipyards to maintain a continuous flow of work upon new construction owing to the unceasing demand for ship repair work, which took precedence over new construction.

(*b*) *Merchant Vessels.* From the inception of the co-ordination of ship repairs until December, 1945, altogether 11,987 ships, of a total of 51,962,840 tons, had undergone repair or heavy maintenance. During the same period 1,772 merchant ships of a total of 6,020,240 tons were dry docked or slipped.

(*c*) *Naval Vessels.* Naval ships that underwent major refit, maintenance, or repair in Australia from September, 1939 to 15th August, 1945, were as follows, the tonnage being shown in parenthesis :—Royal Australian Navy, 4,008 (2,150,000) ; Royal Navy, 391 (1,671,000) ; United States Navy, 513 (800,000) ; Dutch Navy, 171 (220,000) ; and French Navy, 44 (92,000) ; total, 5,127 (4,933,000).

(iv) *Small Ships Construction.* The Board was responsible from August, 1942 to October, 1943 for the construction of auxiliary marine craft to meet the requirements of the Australian Navy, Army, and Air Force Services, and the United States Armed Forces in Australia.

A great deal of intensive investigation was required in the early stages in order to provide facilities for small craft construction, and to distribute the work to the best advantage.

At the date of transfer to the Small Craft Construction Directorate total requirements of 8,862 craft had been submitted to the Board from all Services, etc., while of 6,644 craft ordered 2,416 had been completed and handed over as follows :—United States Armed Forces in Australia, 2,267 ; Royal Australian Navy, 27 ; Royal Australian Air Force, 92 ; Australian Army, 29, and Allied Works Council, 1.

The estimated total cost of the craft demanded at the date of the transfer was in the vicinity of £18,000,000. Details of the further development of this programme are given in paragraph 11 (ix).

13. **Timber Control.**—(i) *General.* A Controller of Timber was appointed in June, 1941 to mobilize timber supplies necessary for the efficient prosecution of the war, and for services essential to the life of the community.

In October, 1941 a Control of Timber Order was gazetted under the provisions of the National Security (General) Regulations, but in order to provide the necessary machinery for the closer control of timber distribution and use, this order was superseded in March, 1942 by the National Security (Timber Control) Regulations.

These Regulations gave the Controller of Timber powers to govern and direct the production, treatment, handling, sale, supply, movement, distribution, storage, marketing and consumption of timber.

Amendments to the National Security (Timber Control) Regulations were subsequently made as follows :—

(i) On 8th September, 1943, the definition of timber under Regulation 4 was extended to cover processed boards known by the trade names of Masonite and Caneite and similar products, and

(ii) On 23rd February, 1944, Regulation 6 was amended by the addition of paragraphs giving the Controller of Timber power to authorize any person to enter upon any land and to cut and remove therefrom any timber and also to pass and re-pass over any land for the purpose of cutting and conveying timber from other land in the vicinity.

The work of the Timber Control Office continued to function within the Department of Munitions until October, 1945. In November, 1945, the various States assumed control over the production and distribution of timber within State boundaries, the Commonwealth Department of Works and Housing dealing with matters concerning imports, exports, and interstate movement of timber.

(ii) *Production.* Australia used approximately 1,000 million super feet of timber annually in peace-time, of which 650 million were produced locally and 350 million imported.

During the war period the annual production of sawn timber was maintained above the pre-war level, although it declined from 1942–43 onward due to the limiting effects of shortages in manpower, equipment (tractors and trucks, together with spare parts, axes, saws, and other tools) and transport.

(iii) *Consumption and Main Timber Usage for War Purposes.* Approximately 1,704 million super feet of timber were used for direct war purposes up to 30th June, 1945, 267 million super feet prior to the war with Japan and 1,437 million super feet thereafter to June, 1945.

In the following table the total quantity is classified according to usage.

APPROXIMATE QUANTITIES OF TIMBER USED FOR WAR PURPOSES TO 30TH JUNE, 1945.

(Million super feet.)

Particulars.	Quantity.	Particulars.	Quantity.
Construction—		Manufactures—*continued.*	
Armament and Service Buildings	136	Aircraft	13
Camps, Huts, Hospitals, Hangars Stores and other works	370	Pallets	20
Prefabricated Structures	55	Tent Poles and Pegs	13
Dock Sets	17	Furniture, etc.	92
Operational Timber—		Battery Separators	2
Australian Forces	70		
United States Forces	127	Total, Manufactures	346
Wool Stores	45		
Total, Construction	820	Cases—	
		Foodstuffs for Armed Forces	455
Manufactures—		Clothing for Armed Forces	44
Munition Boxes	99	Equipment	39
Rifles, Weapons and Accessories	15	Total, Cases	538
Bridging Equipment and Assault Craft	10		
Small Craft	50		
Large ship construction and repair	32	Grand Total	1,704

In addition to sawn timber as aforementioned, the forests of northern New South Wales and Queensland were drawn upon heavily for various wharf construction projects carried out in north Queensland and at operational bases in islands in the South West Pacific.

(iv) *Imports.* Before the war approximately two-fifths of the timber used in Australia were imported, including practically the whole of the constructional timber used in the principal cities and a substantial proportion of the case-making timber.

Following the outbreak of war, imports of timber, principally from Canada, were drastically restricted to conserve dollar exchange and shipping space, with the result that the quantity of timber imported into Australia declined from 324 million super feet in 1938–39 to 32 million super feet in 1942–43. Imports in 1943–44 increased to 45 million super feet and in 1944–45 to 92 million super feet.

(v) *Exports.* The export of timber from Australia was prohibited in October, 1941 except under licence issued by the Department of Trade and Customs. Limited quantities of hardwoods were made available to South Africa from time to time, principally from Western Australia, for the maintenance of railway systems and governmental works. Large quantities of sleepers, scantlings, and heavy wharf timbers were exported during 1941 and 1942 for military use in the Middle East and Iraq. A regular supply of hardwoods to New Zealand was continued under a reciprocal trade arrangement in exchange for quantities of New Zealand timbers suitable mainly for case manufacture.

14. **Electricity Supply Control.**—(i) *General.* The control of electricity supply was undertaken by the Department of Munitions in September, 1942, with the object of ensuring that generation, transmission, distribution and supply of electricity be mobilized and co-ordinated; that electricity generating sets, boilers, transformers, switchgear, and all associated and incidental materials and property be made available where most needed; and that all supplies of electricity be maintained at their fullest capacity.

(ii) *Pool Stock.* Owing to difficulties of supply from overseas, action was taken to arrange for a stock of equipment likely to be required in the event of enemy action.

(iii) *Service Requirements.* Returns of all generating plant were called for early in 1943, and a list was compiled showing plant available for transfer for use elsewhere. Plant required by the Services or other Departments was allotted from this list, and the Directorate of Machine Tools was requested to complete the acquisition.

(iv) *Rural Supply.* A scheme was drawn up in conjunction with the Controller of Food Supply to facilitate the supply of electric power to food producers in country areas, and to assist Supply Authorities to obtain materials for extensions of their reticulation for this purpose.

(v) *Munitions Factories.* Arrangements were made to provide electricity to various munitions factories and service establishments.

(vi) *Fuel Supplies.* Due to a shortage of black coal, it was necessary to effect savings in fuel, and to do so without loss of efficiency. Restrictions were placed on the use of electric light for non-essential purposes, principally in connexion with display and decorative lighting, excessive street lighting, and outside lighting for sports.

15. **Labour Supply and Services.**—(i) *General.* At the time of the formation of the Department of Munitions, the four existing Commonwealth munitions factories were employing in all about 10,000 persons.

Wages rates and working conditions in the three Victorian munitions factories were as provided by an agreement made between the Department and 13 unions in 1939, and at the Lithgow Small Arms Factory wage rates were fixed and conditions prescribed by a determination made by the Public Service Arbitrator.

Upon the establishment of Government factories in other States, the munitions agreement was extended to cover employees in factories other than small arms establishments. The Lithgow determination was extended to apply to the small arms feeder factories in various parts of New South Wales.

(ii) *Employment.* The plan for munitions production contemplated a calculated employment of some 150,000 persons, and it was thought that probably as many more would be employed in a "feeder" capacity.

Details of employment in administrative sections of the Department, and at munitions factories and establishments, are given in paragraph 9 (viii), while employment in annexes (as far as can be ascertained) is given in paragraph 10. General employment statistics, so far as contracrors were concerned, were not within the functions of the Munitions Department.

Changes in the incidence of employment directly in the munitions effort are indicated briefly in the following table, which includes an estimate of employment outside the Government Establishments :—

DIRECT MUNITIONS EMPLOYMENT : AUSTRALIA.

Particulars.	Number at peak employment, April–June, 1943.	30th June— 1943.	1944.	1945.	Decrease April, 1943 to June, 1945.
Government Factories—					
Male	33,676	32,210	20,368	16,087	17,589
Female	23,121	22,548	12,035	7,656	15,465
Total	56,797	54,758	32,403	23,743	33,054
Industry (estimated)—					
Male	84,196	84,196	59,543	34,000	50,196
Female	15,428	15,428	9,964	8,000	7,428
Total	99,624	99,624	69,507	42,000	57,624
Total direct employment(*a*)—					
Male	117,872	116,406	79,911	50,087	67,785
Female	38,549	37,976	21,999	15,656	22,893
Grand Total	156,421	154,382	101,910	65,743	90,678

(*a*) Excludes employment in administrative offices shown in paragraph 9 (viii).

(iii) *Medical Services.* Since 1st July, 1942, the Munitions Medical Service has been administered by the Director-General of Health.

There were 49 casualty centres at 34 different munitions establishments as at 30th June, 1944. At the three largest explosives factories there were pathological laboratories, and X-ray plants at two other large factories.

Between July, 1942 and June, 1945, the total attendances of munitions employees for initial medical examinations, periodical examinations for industrial diseases, treatment and dressings for accidents on duty, or advice in respect of illness (exclusive of X-ray and biochemical and blood examinations) were as follows :—New South Wales, 567,785 ; Victoria, 582,097 ; Queensland, 26,009 ; South Australia, 341,897 ; Western Australia, 81,905 ; Tasmania, 43,358 ; total, 1,643,051.

(iv) *Dilution of Labour.* It was realized early that war conditions would create a demand difficult of fulfilment for tradesmen in metal industries and in 1940 dilution

agreements were entered into between the Commonwealth Government, employers' associations, and unions concerned covering engineering, boiler-making and blacksmithing trades. Upon the creation of the Department of Labour and National Service in October, 1940, administrative control of matters relating to dilution of labour was transferred to that Department. Certain other trades in which shortages of tradesmen existed were later covered by dilution agreements, and the principles involved in the various agreements were subsequently incorporated in the National Security Regulations.

In all except the metal moulding, boot and shipwrights' trades (in which provision was made for up-grading only) "added tradesmen" under the dilution schemes were either persons up-graded as tradesmen, or trainees accorded tradesman status after undergoing an approved course of training, and they were paid the appropriate award rate for the work to which allotted. Employers were not permitted to employ added tradesmen while competent recognized tradesmen of the same classification were available.

At June, 1944, registered added tradesmen in employment or training in Australia numbered 38,164, comprising 21,439 up-graded employees, 16,685 trainees in employment and 40 trainees in training. The distribution among States was as follows :—New South Wales, 17,386 ; Victoria, 12,524 ; Queensland, 2,289 ; South Australia, 3,759 ; Western Australia, 1,398 ; and Tasmania, 808.

The numbers in the various trades comprised :—Engineering—up-graded, 14,529 ; trainees, 16,218 ; in training, 9 : Boilermaking—upgraded, 2,260 ; trainees, 163 ; in training, 26 : Blacksmithing—up-graded, 345 ; trainees, 9 : Electrical—up-graded, 983 ; trainees, 95 ; in training, 1 : Sheet-metal—up-graded, 501 ; trainees, 200 ; in training, 4 : Metal Moulding—up-graded, 567 : Boot—up-graded, 897 : Shipwright—up-graded, 1,357.

16. **Finance Branch.**—(i) *General.* The projects developed under the control of the Director-General of Munitions were undertaken in pursuance of a mandate given by War Cabinet whereby the Director-General was authorized to proceed if the proposals upon which the projects were based had been favourably considered by War Cabinet. These proposals were the recommendations and demands for munitions and war material submitted by the Defence Services, and upon these were built up the respective projects of the Munitions Development Programme.

The Director-General of Munitions had power also to make and vary contracts, which implies that he had power also to dispense with the customary procedure of inviting tenders in cases where he considered it expedient. The Director-General delegated his powers in this respect to the Director of Finance.

(ii) *Munitions Annexes.* Prior to the war, arrangements were made for the establishment of about 25 annexes attached to the works of commercial firms and State Railway Departments which were to manage and operate them.

The expansion in the Munitions programme subsequent to the creation of the Department of Munitions led to the establishment of many other annexes, and the amount allocated for subsidy of industry for production of munitions reached £20,000,000.

As at 30th June, 1945, a total of £16,429,750 had been authorized by the Director-General for armament annexes, plant and experimental work, of which £13,284,611 had been expended. Details are as follows :—New South Wales, authorizations, £6,094,438 (expenditure, £4,722,875) ; Victoria, £7,156,106 (£5,847,889) ; Queensland, £119,945 (£36,612) ; South Australia, £2,064,998 (£1,851,127) ; Western Australia, £401,887 (£329,177) ; Tasmania, £262,473 (£189,567) ; miscellaneous items, all States, £227,251 (£206,641) ; and Optical Munitions research and development, various States, £102,652 (£100,723). Total authorizations at the 30th June, 1945 by the Director-General in respect of tool room annexes at the New South Wales, Queensland, South Australian, Western Australian and Tasmanian Railways amounted to £405,021, of which £317,912 had been expended.

The number of projects in respect of which funds were allocated was 244, distributed amongst the States as follows :—New South Wales, 95 ; Victoria, 94 ; Queensland, 6 ; South Australia, 31 ; Western Australia, 11 ; and Tasmania, 7.

(iii) *Costs of Munitions.* The following statement sets out the costs of some of the major items of weapons and ammunition, and of machine gun carriers. Costs of components were assembled annually, the price of the complete item being determined as at the 30th June of each year. The prices quoted hereunder were the lowest thus ascertained, for delivery to the Australian Services.

MACHINE GUN CARRIERS, WEAPONS, AND AMMUNITION: COSTS.

Item.	Price. £	s.	d.
	Each.		
Machine Gun Carrier L.P. No. 2	1,500	0	0
Weapons—			
3.7″ Anti-Aircraft Gun—ordnance and mounting	6,000	0	0
25-pounder Gun—ordnance, carriage, and trailer	4,500	0	0
25-pounder Short Gun—ordnance and carriage	3,300	0	0
17-pounder Gun—ordnance and carriage	4,000	0	0
4″ Naval Gun, Mark XIX—including mounting	5,661	0	0
2-pounder Anti-Tank Gun—ordnance and carriage	1,750	0	0
3″ Mortar	150	0	0
Machine Gun, Vickers—excluding mounting	109	0	0
Machine Gun, Bren—excluding mounting	146	0	0
Rifle .303″	12	7	0
Bayonet	1	3	1
Scabbard	0	9	8
Ammunition—Filled and packed, except where otherwise stated—			
Small Arms Ammunition—	Per thousand.		
.303″ Ball	9	7	8
.303″ Tracer	19	12	4
.303″ Armour Piercing	18	3	1
.303″ Incendiary	24	3	0
9 m.m	7	1	6
	Each.		
20 m.m. H.E. Incendiary—Hispano	0	15	9
20 m.m. H.E. Incendiary—Oerlikon	0	17	3
Cartridge, Q.F., H.E., 18-pounder Shell S.L.	2	13	8
Cartridge, Q.F., 3.7″ Gun H.E. Shell	7	3	1
Cartridge, Q.F., 6-pounder, 7 cwt. A.P. Shot	3	7	6
Cartridge, Q.F., 4″ Mk. XIX Gun, H.E. Shell (plugged)	12	10	6
Cartridge, Q.F., 4″ Mk. XIX Gun, Star Shell (plugged)	16	1	6
Cartridge, Q.F., 2-pounder, H.E. Shell, high velocity (including link belting)	2	14	3
Cartridge, Q.F., 2-pounder, H.E. Shell, low velocity (including link belting)	2	7	7
Cartridge, Q.F., 25-pounder	1	5	5
Shell, Q.F., H.E., 25-pounder, S.L. (fuzed 117)	2	10	0
Cartridge, Q.F., 4.5″ Howitzer	1	2	4
Shell, Q.F., H.E., 4.5″ Howitzer (fuzed)	3	6	5
Shell, Smoke, 4.5″ Howitzer (plugged)	2	19	9
Cartridge, B.L., 6″ Howitzer	1	2	7
Shell, B.L., H.E., S.L., 6″ Howitzer (filled, plugged, and grummeted)	6	13	0
Cartridge, B.L., 6″ Gun, Cordite S.C. 103, Mark I Foil, 11 lb. 10½ oz.	2	15	7
Cartridge, B.L., 6″ Gun, Cordite S.C. 150, Mark I. Foil, 33 lb. 0 oz. 12 drms.	7	6	7
Shell, B.L., C.P.B.C., 6″ Gun, Mark XXXIB (filled, plugged and grummeted)	22	13	11
Shell, B.L., H.E., 6″ Gun, Mark XXVIIIB (filled, plugged and grummeted)	6	17	1
Cartridge, B.L., 60-pounder	2	10	9
Shell, B.L., H.E., 60-pounder (filled, plugged and grummeted)	4	14	6

MACHINE GUN CARRIERS, WEAPONS, AND AMMUNITION: COSTS—*continued.*

Item.	Price.
	£ s. d.
Ammunition—Filled and packed, except where otherwise stated—*continued.*	
Small Arms Ammunition—*continued.*	Each.
Bomb M.L., 2″ Mortar, H.E.	1 9 2
Bomb M.L., 3″ Mortar, H.E., 10 lb. (fuzed 152)	1 19 11
Bomb S.B.B.L., 4.2″ Mortar, H.E.	6 4 6
Bomb, Aircraft, H.E., A/S 250 lb.	24 9 5
Bomb, Aircraft H.E., G/P, 250 lb.	16 2 0
Bomb, Aircraft Practice, 8½ lb.	0 14 1
Depth charge—	
Case (filled Amatol)	21 2 0
Pistol	9 4 0
Primer	2 13 0
Detonator	0 10 4
Grenade—	
No. 36M—Hand	0 5 0
No. 36M—Rifle	0 7 9
No. 63	0 6 9
No. 68	1 4 9
No. 69	0 12 9
No. 73	1 6 0
No. 77	0 18 3
Naval mine (empty)	94 0 0
Mine Contact A.T., Mark II	2 4 9
Mine Contact A.T., Mark V	1 5 6
Cartridge Signal, 1½″ Red	0 3 6
Cartridge Signal, 1½″ Green	0 3 6
Flare, Aircraft Reconnaissance, 4.5″	14 0 0
Flare, Landing Wing Tip	1 12 6
Marker, Sea, Aluminium	4 2 6
Signal Distress, Marine	3 14 0
Smoke Float	12 0 9

(iv) *Expenditure.—(a) Summary.* The following table gives a summary of the total expenditure incurred on account of munitions during the years 1939–40 to 1944–45 :—

MUNITIONS: TOTAL EXPENDITURE.

Particulars.	1939–40.	1940–41.	1941–42.	1942–43.	1943–44.	1944–45.
	£'000.	£'000.	£'000.	£'000.	£'000.	£'000.
Parliamentary Appropriations (including Reciprocal Lend-Lease) and Lend-Lease(*a*)	3,798	14,857	24,284	29,760	36,756	25,620
Trust Fund Accounts	4,555	20,160	84,716	152,765	121,722	83,083
Munitions Department for other Administrations	(*b*)	4,357	4,354	4,139	14,202	2,852
Total	8,353	39,374	113,354	186,664	172,680	111,555

(*a*) Includes approximately £25,000,000 over the years 1942–43 to 1944–45 proportion of Reciprocal Lend-Lease, not included under Munitions in § 6, Chapter XVIII. (*b*) Included above.

Details of expenditure under Parliamentary appropriations will be found in § 6, Chapter XVIII.

(*b*) *Trust Funds.* The table hereunder shows the expenditure from the various Munitions Trust Funds during the years 1939-40 to 1944-45 :—

MUNITIONS : TRUST FUND EXPENDITURE.

Fund.	1939-40.	1940-41.	1941-42.	1942-43.	1943-44.	1944-45
	£'000.	£'000.	£'000.	£'000.	£'000.	£'000.
(i) Government Munitions Factories and Establishments	3,941	10,810	26,003	42,829	34,935	20,501
(ii) Manufacture of Munitions	614	9,350	42,213	82,340	67,723	53,831
(iii) Machine Tools ..	(*a*)	(*a*)	2,801	7,928	4,511	2,675
(iv) Materials	(*a*)	(*a*)	13,699	19,668	14,553	6,074
(v) Aluminium Production..	..	..	..	..	..	2
Total	4,555	20,160	84,716	152,765	121,722	83,083

(*a*) Charged against Parliamentary appropriations.

In 1939-40 and 1940-41 certain of the expenditure from (i), and from 1941-42 onwards the greater part, was financed through (ii). There is therefore considerable duplication when (i) and (ii) are combined. It is desirable, however, that they should be added if an overall picture of the financial transactions is to be obtained.

§ 8. Department of Aircraft Production.*

1. **General.**—Arising out of the visit of the United Kingdom Air Mission in 1939, an agreement was entered into between the Governments of the United Kingdom and Australia for the manufacture in Australia of Bristol Beaufort bombing and reconnaissance aircraft. The Air Mission's report, made in March, 1939, received the approval of the Government at the end of that month and, upon the creation of the Department of Supply and Development, Aircraft Construction was constituted a branch of that Department. In July, 1939, the Aircraft Construction Branch began to function but, in March, 1940, with the extension of aircraft manufacture in Australia, it was reconstituted as the Aircraft Production Commission.

2. **The Aircraft Production Commission.**—The Commission, consisting of a Chairman, two other full-time executive members, and three part-time members, was a statutory body reporting to the Minister for Supply and Development until 11th June, 1940, and then to the Minister for Munitions until June, 1941, when the separate Department of Aircraft Production was established with its own Minister.

The functions of the Commission were, broadly, to control the manufacture of aircraft and aero engines in Australia, with responsibility for maintaining and operating factories established or purchased by the Commonwealth for the production of aircraft ; for making arrangements, agreements or contracts for the acquisition, manufacture or assembly of aircraft ; for exercising full control over the manufacture of aircraft for or on behalf of or at the instance of the Commonwealth and of matters connected therewith or arising thereout ; for arranging for the overhaul and repair of aircraft in places other than Air Force establishments ; for arranging for the supply, either from within Australia or from overseas, of materials, tools, and equipment required by aircraft manufacturing undertakings under the control of the Commission ; for developing local sources of supply

* As from 1st November, 1946 the activities of the Department of Munitions and of the Department of Aircraft Production were amalgamated, subsequent aircraft production activities being conducted by the Division of Aircraft Production, Department of Munitions.

of raw and fabricated materials for aircraft requirements; for controlling and limiting profits in relation to the manufacture of aircraft; and for giving effect to any such other powers and functions conferred or imposed by the Governor-General.

3. **Appointment of Director-General of Aircraft Production.**—The constitution and details of organization of the Commission were retained until 6th January, 1942, when the Aircraft Production Commission was abolished and under Statutory Rule No. 4 of 1942, National Security (Aircraft Production) Regulations, the production of aircraft was entrusted to the Director-General of Aircraft Production, assisted by an Advisory Committee representative of the chief interests concerned in the Australian aircraft industry.

Under these Regulations, the Director-General of Aircraft Production, who required also to be Director-General of Munitions, was made responsible for the operation and management of factories, workshops and undertakings concerned in the production of aircraft; for the acquisition by the Commonwealth and the establishment of factories and workshops for the purpose of production of aircraft, and for repair and maintenance work; for the control of the nature and extent of the output or production of any person or authority engaged or capable of being engaged in the production of aircraft; for the arrangements, and all action necessary, to secure the supply, manufacture, processing and delivery of aircraft, including maintenance, overhaul, and repair of aircraft; for the securing of supplies of materials, plant, tools and equipment for those purposes; and for the employment and training of persons for those purposes.

The Regulations were unchanged until 1st June, 1945, when it was provided (Statutory Rule No. 83 of 1945) that the Permanent Head for the time being of the Department would be the Director-General of Aircraft Production and that the Aircraft Advisory Committee would be disbanded. As from 3rd June, 1946 the position of Director-General of Aircraft Production was abolished (Statutory Rule No. 94 of 1946) and it was provided that the permanent head of the Department would be the Secretary.

4. **The Beaufort Scheme.**—The original Beaufort scheme was based upon (i) the utilization of existing railway organizations and floor space in New South Wales, Victoria and South Australia; (ii) the erection of large main assembly workshops at Fisherman's Bend (Victoria) and Mascot (New South Wales) for the assembly and fitting out of the aircraft; (iii) the erection of a main store; and (iv) the setting up of a central organization to manage the undertaking.

The whole of the physical and managerial organization had to be developed after 1st July, 1939, and while this was being undertaken in Australia the central administration was engaged upon the planning of production. Concurrently, 80 specially selected technicians, consisting of highly-skilled tradesmen, chemists, metallurgists, etc., were sent to England for training.

Under the original agreement, the Bristol Aeroplane Company, designers and manufacturers of the Beaufort, had undertaken to supply all the jigs, tools and fixtures. War conditions prevented the Company from meeting its commitments and it became necessary to undertake the manufacture in Australia of no fewer than 26,000 of the total of 33,000 tools required for the aircraft. Furthermore, it was contemplated that the whole of the raw materials and equipment necessary for the construction of the aircraft included in the initial order for 180 airframes would be obtained from Great Britain, but supplies from that source were interrupted by war conditions and it was necessary to arrange for the obtaining of supplies from the United States of America.

The first Australian Beaufort—an experimental machine—made its first flight on 5th May, 1941. The first production Beaufort was completed in July, 1941, and accepted by the R.A.A.F. the following month. The hundredth Beaufort was delivered in August, 1942, 400 by August, 1943, and 700 by August, 1944.

5. **Production of Beaufighters.**—Authority was given by War Cabinet in December, 1942, for the production of Beaufighters in the Government workshops, concurrently with the tapering off of Beaufort production when the programme of 700 Beauforts was approaching completion. The first Australian Beaufighter, a type closely related structurally to the Beaufort, was delivered to the R.A.A.F. on 31st May, 1944. Both Beauforts and Beaufighters were being delivered until the Beaufort programme was

completed in August, 1944, at 700 aircraft. By the end of the war, 329 Beaufighters had been delivered and production was then planned on the basis of completing only those aircraft which were already in an advanced stage of assembly, representing total delivery of 364 Beaufighters, the last being delivered in January, 1946.

6. **Production of Lincolns.**—Before Beaufighter deliveries had commenced, technical personnel from the Government workshops had been sent to England to study the technique adopted in the works of A. V. Roe & Co. Ltd. in the production of Lancaster aircraft which had been authorized by War Cabinet for manufacture in Australia on the recommendation of the Aircraft Production Mission, 1943. The Mission, comprising representatives of the Department of Air and the Department of Aircraft Production, visited the United States of America and Great Britain early in 1943 to study the latest types of aircraft being developed by the Allied Nations and to determine the most suitable types of fighter and bomber aircraft for production in Australia. The Lancaster heavy bomber was recognized as having no equal in range or bomb-load for its all-up weight and the type selected for production in Australia incorporated so many improvements and design changes compared with earlier Lancasters that the machine was renamed the Lincoln. In addition to making heavy bombers, the Government workshops will also make a number of Tudor military transports, the commercial version of the Lincoln. The first Australian Lincoln was delivered in May, 1946.

7. **The Commonwealth Aircraft Corporation Pty. Ltd.**—(i) *Wirraway and Boomerang Production.* The Commonwealth Aircraft Corporation Pty. Ltd., established in 1937, had commenced the production of Wirraway advanced trainer and general purpose aircraft, which were based on a design developed by North American Aviation Inc. The company was also manufacturing single row Wasp 650 h.p. 9-cylinder radial aircraft engines for installation in the Wirraway aircraft.

Wirraway production continued uninterruptedly until early in 1942 when it was decided by War Cabinet that the production of trainer aircraft would cease in order to enable all facilities to be devoted to the manufacture of operational types of aircraft. Further Wirraways to replace R.A.A.F. wastage were delivered in limited numbers from March, 1944 on. In the meantime, the Company had designed, manufactured, and between May, 1941 and June, 1942 delivered to the R.A.A.F. substantial numbers of Wackett Trainers, a low-wing monoplane type of trainer intermediate between the Tiger Moth elementary trainer and the Wirraway. Boomerang interceptor-fighter aircraft, built to a design developed by the Commonwealth Aircraft Corporation from the Wirraway, were delivered by the Company between August, 1942 and January, 1945. Concurrently with the production of Boomerangs, the Corporation was developing a bomber to its own design but work on this project was terminated at the direction of War Cabinet, when the first machine was completed, in order to enable all available manpower to be concentrated on the manufacture of Mustang high altitude fighter aircraft.

(ii) *Mustang Production.* The Mustang, designed by North American Aviation Inc. to meet a British specification, was the fighter type selected by the Australian Aircraft Production Mission, 1943, and the first locally made machines of that type were delivered during May, 1945. Although a reduction was made in the total number of Mustangs to be produced following the end of the war, the company is continuing production on a reduced scale to meet the peace-time requirements of the R.A.A.F.

8. **De Havilland Aircraft Pty. Ltd.**—(i) *General.* De Havilland Aircraft Pty. Ltd. was engaged in the manufacture of types of aircraft designed by the De Havilland Company in England but engines and metal parts were imported. At the outbreak of war, the company was instructed to proceed with the production of large numbers of Tiger Moth elementary trainer aircraft.

(ii) *The Tiger Moth.* The first of these machines was delivered during May, 1940, and deliveries continued uninterruptedly until August, 1942, when more than 1,000 aircraft had been completed, including some hundreds that were sent to other British countries and to the Netherlands East Indies. A small number of additional aircraft to replace R.A.A.F. wastage was delivered from September, 1944 to January, 1945.

(iii) *Other Production.*—From October, 1942 to June, 1943 deliveries were made of De Havilland Dragon aircraft fitted out for different types of services, some as transports, others as training machines for wireless-air gunners' and air-navigators' schools, and still others as ambulances. A small number of gliders was designed and built between October, 1942 and July, 1943, but quantity production was not found to be necessary. From that time on until the end of the war the De Havilland Company was engaged in the manufacture of Mosquito fighter-bomber aircraft, the first aircraft having been delivered in March, 1944. Since VP-Day, the rate of production of Mosquitoes was restricted to provide for R.A.A.F. requirements on a peace-time basis. During August, 1946 Cabinet authorized the production of Vampire jet-propelled fighter aircraft for the R.A.A.F., and this project is now in hand.

9. **Manufacture of Engines.**—Although the Australian Beaufort was originally designed for the Bristol Taurus engine, it became necessary because of war conditions to fit the more powerful American Pratt & Whitney twin-row Wasp engines instead, even though the change involved important modifications to the airframe. A factory was established at Lidcombe, New So th Wales, for the manufacture of the American engine.

Because the Commonwealth Aircraft Corporation Pty. Ltd. had successfully developed the production of single row Wasp engines, that Company was invited by the Commonwealth Government to establish and conduct the Lidcombe engine factory as a Government annexe. The first 1,200 h.p. 14-cylinder twin row Wasp radial engine was delivered during November, 1941, and the last of 876 required, together with vast quantities of spare parts, had been delivered by July, 1945.

As the latest types of aircraft approved for production in Australia—Mosquito, Mustang, Lincoln and Tudor—are all fitted with Rolls Royce Merlin in-line engines, the Lidcombe engine factory was converted to enable the Merlin engine to be produced and factory tests of the first Australian-made engines have taken place.

To provide engines for Tiger Moth and Dragon aircraft manufactured by De Havilland Aircraft Pty. Ltd., the production of Gipsy Major engines was undertaken by General Motors-Holden's Ltd. and 1,300 of these 130 h.p. 4-cylinder engines were delivered between September, 1940, and March, 1944.

In August, 1946 the Commonwealth Aircraft Corporation Pty. Ltd. was authorized to produce Rolls Royce "Nene" gas-turbine engines for installation in the Vampire aircraft referred to in para. 8 (iii) above.

10. **Manufacture of Propellers, Etc.**—Annexes were established also for the production of propellers for all types of aircraft by De Havilland Aircraft Pty. Ltd.; of retractable under-carriages for Beaufort, Beaufighter and Lincoln aircraft by National Motor Springs Pty. Ltd.; of heavy forgings for engines and propellers by the Australian Aluminium Company; of engine electrical accessories by Tecnico Ltd.; and of gun turrets and armament, aero instruments, and aluminium sheet, strip, bar and extrusions to aircraft specifications.

11. **Expansion of Repair and Overhaul Facilities.**—Concurrently with the establishment and expansion of capacity for the production of aircraft and the major aircraft components, facilities were being rapidly expanded for the repair and overhaul of aircraft outside R.A.A.F. establishments, particularly of aircraft associated with the Empire Air Training Scheme whose maintenance was the responsibility of the Department of Aircraft Production. Hangars, engine overhaul shops, machine shops and stores were erected by the Commonwealth near all mainland capital cities and the civil airline operators were engaged as servicing contractors to handle the work. With the arrival of the United States Army Air Forces in Australia in 1942, the scope and volume of this work were greatly expanded and special additional facilities were set up. By the end of the war, nearly 12,000 engines and 4,250 airframes had been repaired and overhauled for the R.A.A.F., the United States Army Air Forces, the Royal Navy and the Netherlands East Indies Forces. In addition millions of engine and airframe components and accessories, instruments, propellers, etc., had been overhauled.

Spare parts, raw materials, etc., supplied in response to demands placed on the Department of Aircraft Production by the R.A.A.F. and the other authorities whose aircraft were handled, had a total value in excess of £30,000,000 during the war years.

12. **Personnel.**—Persons employed in the aircraft industry, excluding those engaged in the manufacture of parts in private engineering establishments handling sub-contracts, increased to more than 44,000 in 1944, as is shown in the following statement :—

AIRCRAFT INDUSTRY : PERSONS EMPLOYED, AUSTRALIA.(a)

In June—	On production.	On Maintenance.	Total.
1940	4,903	(b)	4,903
1941	11,887	(b)	11,887
1942	23,654	3,166	26,820
1943	31,314	8,250	39,564
1944	33,564	10,538	44,102
1945	29,537	4,847	34,384
1946	11,355(c)	270	11,625

(a) Excludes those engaged in the manufacturing of parts in private engineering establishments handling sub-contracts. (b) Not available. (c) Includes personnel employed on maintenance work in departmental workshops and others engaged in disposal activities.

13. **Numbers of Aircraft and Engines Produced.**—Production of aircraft and engines during each of the war years is set out hereunder :—

AIRCRAFT AND ENGINES : PRODUCTION, AUSTRALIA.

Type.	1939-40.	1940-41.	1941-42.	1942-43.	1943-44.	1944-45.	1945-46.
AIRCRAFT.							
Beaufort	..	..	76	285	312	27	..
Beaufighter	..	..	..	..	3	281	80
Lincoln	..	..	..	..	..	..	1
Wirraway ..	75	225	320	..	30	60	46
Wackett Trainer	..	13	187	..	..	..	..
Boomerang	..	..	..	105	103	42	..
Mustang	..	..	..	..	..	4	73
Tiger Moth ..	8	453	508	66	..	35	..
D.H. Dragon ..	..	..	..	87	..	..	..
Mosquito	..	..	..	..	6	80	91
Gliders	..	..	..	6	2	..	..
Total ..	83	691	1,091	549	456	529	291
ENGINES.							
Twin-row Wasp	..	..	66	231	343	228	2
Single-row Wasp ..	76	195	291	86	32	..	..
Gipsy Major ..	..	319	318	461	202	..	..
Total ..	76	514	675	778	577	228	2

14. **Peace-time Establishment.**—It has been decided by the Commonwealth Government that the capacity established and the experience gained during the war years in the production of trainer and operational aircraft for defence purposes will be retained as a fundamental feature of Australia's peace-time establishment. To this end, limited

production of the most modern types of fighter and bomber aircraft will be continued each year to equip the permanent R.A.A.F. establishments and to ensure that, should the necessity again arise, the production of operational aircraft can be rapidly expanded.

To meet the limited peace-time demands of the R.A.A.F., the Government aircraft workshops to be retained in operation will be those at Fisherman's Bend and Essendon (Victoria) only. Single-engine fighter types of aircraft will continue to be produced by the Commonwealth Aircraft Corporation Pty. Ltd. and twin-engine long-range fighters by De Havilland Aircraft Pty. Ltd.

§ 9. Expenditure on Defence.

Details of expenditure on Defence and 1939–45 War Services will be found in Chapter XVIII., Public Finance, B.—Commonwealth Finance, § 6. Cost of Defence and 1939–45 War Services.

§ 10. Australian Contingents.

1. **General.**—In earlier issues of the Official Year Book an account is given of the composition, etc., of the Australian contingents dispatched for service in the New Zealand and Sudan Campaigns, in South Africa, China, and the 1914–19 War (see Official Year Book No. 12, pp. 1019 *et seq.*).

2. **Australian Troops (1914–19 War).**—Particulars of the enlistments, casualties, honours and decorations won, and engagements of the Australian Imperial Force during the 1914–19 War are given in Official Year Book No. 16, pp. 628 *et seq.*

3. **Australian Troops (1939–45 War).**—For details of the Australian Military Forces in the 1939–45 War *see* §§ 1 and 4–6 of this Chapter.

§ 11. War Gratuities.

1. **1914–19 War.**—Reference is made in earlier issues of the Official Year Book (*see* No. 15, p. 930) to the bonus payable in accordance with the War Gratuity Acts of 1920 as a war service gratuity to soldiers and sailors who served in the 1914–19 War. Owing to limitations of space this information cannot be repeated, but it may be noted that the gratuity was paid in Treasury Bonds, maturing not later than 31st May, 1924, and bearing interest at 5¼ per cent. In necessitous cases payment was made in cash when desired by the person entitled. The first gratuities were made available about the beginning of June, 1920. The total amount paid to 30th June, 1945 was £27,515,026 and bonds amounting to £11,965 had not been redeemed at that date.

2. **1939–45 War.**—(i) *General.* The War Gratuity Act 1945, which began to operate on 31st August, 1945, provides for payment to members of the forces of war gratuity (*a*) at the rate of £3 15s. per month of overseas service and of certain subsequent periods in Australia, and (*b*) at the rate of 15s. per month of Australian service after 6th December, 1941, other than that for which payment at the overseas rate is made. New Guinea, Papua and Norfolk Island are regarded as overseas areas after 6th December, 1941. Qualifying service necessary for gratuity ceases on discharge or twelve months after the cessation of hostilities if the member is still serving.

(ii) *Overseas Rate.* Gratuity at the overseas rate is granted in respect of the full term of service overseas, subject to a qualifying period of 90 days continuous or 180 days in the aggregate in twelve months, and for 90 days after the return of a member to Australia. In addition, if the member is invalided back to Australia, the period spent on return in hospital or in convalescence will also qualify at the overseas rate. All members who perform overseas qualifying service will be paid a minimum of twelve months' gratuity at the overseas rate, irrespective of whether the full twelve months period had been completed or not. Service overseas must have been as a member of a body, contingent or detachment of the defence force, subject to necessary adaptations to cover the Navy and the Air Force.

(iii) *Australian Rate.* The Australian rate of 15s. per month will be paid for the period following the outbreak of the war with Japan on 7th December, 1941, subject to a qualifying period of six months' service. A member who had already completed six months' service on that date would qualify as from 7th December.

(iv) *Additional Gratuity in Case of Death.* In cases of death where members of the family were totally dependent on the deceased member, it is provided that the minimum payment shall be equivalent to three years' gratuity calculated at the overseas gratuity rate. This applies to deaths due to war service either overseas or in Australia, and covers not only deaths occurring during qualifying service, but also deaths of members eligible for gratuity, which occurred between date of discharge and a date twelve months after the end of the war. It also applies to deaths of members who had no overseas service and who, having died in Australia before completion of six months' service on or after 7th December, 1941, did not qualify for gratuity payment.

In respect of all other cases of death, overseas and in Australia, due to war service, gratuity at the rate accruing to the member at the date of notification of his death will be continued for a further seven months. Because of the provision for minimum payment of twelve months' gratuity for overseas qualifying service the minimum payment for deaths on overseas service will be for one year and seven months.

Missing members of the forces and prisoners-of-war will qualify for gratuity in respect of the time they were recorded as missing or prisoners-of-war. Should they ultimately be reported dead, the gratuity will run for seven months subsequent to notification of death.

(v) *Entitlement and Payment.* Entitlement to gratuity will be established generally six months after the cessation of hostilities. No bonds will be issued, but the member will be notified of the amount to his credit and five years later this will be paid to him in cash or into his bank account. Payment may be made at earlier dates to the widow of a member, to a totally dependent or necessitous mother or older sister if acting in the capacity of a parent, to blind and permanently incapacitated members, or where the amount credited is less than £10.

Payment will include compound interest at the rate of 3.25 per cent. per annum on the yearly credit balances. Both gratuity and interest will be tax free and will not be regarded as property or income for purposes of the Invalid and Old-age Pensions Act, the Australian Soldiers' Repatriation Act or the Widows' Pensions Act. Interest of members in their gratuity is inalienable. In approved cases the gratuity may be made available for the erection or purchase of a home for the member.

(vi) *Administration.* A Registrar of War Gratuities has been appointed to have control over the Register of War Gratuities in which will be kept the accounts of all persons entitled to war gratuity.

The total liability on account of war gratuity is estimated to be £75,000,000. Expenditure during the year 1945–46 was £143,000. Provision is made for financing the Act by appropriation from Consolidated Revenue Fund and by borrowing.