SECTION XXXI.

THE COMMONWEALTH SEAT OF GOVERNMENT.*

§ 1. The Selection of the Territory.

1. **Constitutional Provisions.**—The powers under which the Commonwealth Government has acted in taking steps towards the establishment of a seat of Government are conferred by the Commonwealth Constitution Act 1900. By section 125 of that Act (see p. 44 hereinbefore) it was provided that the seat of Government of the Commonwealth shall be determined by the Parliament and shall be within territory granted to, or acquired by, the Commonwealth. It was also provided (*a*) that the territory shall be situated in New South Wales not less than 100 miles from Sydney, (*b*) that it shall contain an area of not less than 100 square miles, and (*c*) that such portion of the territory as consisted of Crown lands shall be granted to the Commonwealth without any payment therefor. Finally the section provides that Parliament shall sit at Melbourne until it meets at the seat of Government.

2. **Early Steps towards Selection of the Site.**—During the years immediately preceding the federation of the Australian colonies a number of sites was suggested as being suitable for the establishment of the Commonwealth seat of Government, and on the 14th November, 1899, a Royal Commission was appointed by the Government of New South Wales to inspect and report in regard to places in that State proposed for the Federal capital. In all 40 different sites were submitted for consideration, and 23 of these were inspected by the Commission. The conclusion of this Commission was that any one of the three sites—(*a*) Orange (or Canobolas), (*b*) Yass, and (*c*) Bombala-Eden (Southern Monaro) would be suitable for the purpose desired. Having regard to the future, rather than the initial requirements of the Commonwealth, it was considered that Southern Monaro was entitled to the first place, and that Canobolas and Yass might be bracketed as about equally suitable.

(i.) *Inspection of Sites by Members of Commonwealth Legislature.* During the year 1902 the Commonwealth Government decided to give members of the Legislature an opportunity of becoming personally acquainted with the districts in which sites for the Federal capital city had been suggested. These inspections were carried out, and a considerable number of members of both Houses of the Commonwealth Parliament thus gained a knowledge of the districts such as personal inspection alone can supply.

(ii.) *Royal Commission to Report upon Proposed Sites.* With a view to giving effect to the constitutional provision referred to above, the Commonwealth Government on the 14th January, 1903, appointed a Royal Commission, composed of four members, to inquire into and examine the sites proposed for the seat of Government in the following

* This article has been prepared from information gained from personal observation and from data kindly furnished by Lieut. Colonel David Miller, V.D., I.S.O., Secretary for Home Affairs, under whose supervision all preliminary operations in the Federal capital territory have been conducted. Information has also been supplied by Lieut. Colonel Owen, A.I.C.E., Director-General of Works, and Mr. C. R. Scrivener, Director of Commonwealth Lands and Surveys.

localities, viz.:—Albury, Armidale, Bombala, Lake George, Orange—including Bathurst and Lyndhurst—and Tumut, and to report upon each of the sites with as little delay as possible. This Commission inspected each of the districts referred to, and on the 16th July, 1903, handed in its report, which was supplemented on the 4th August, 1903, by a special report on a proposed site for the capital at Dalgety. As to topography and general sutiability the sites inspected were placed in the following order—Albury, Tumut, Orange, Lyndhurst, Armidale and Bathurst (equal), Lake George, and Bombala; Dalgety was placed on an equality with Bombala, but as regards water-supply it was considered second only to Tumut.

(iii.) *Seat of Government Bill 1903.* On the 22nd September, 1903, the Commonwealth Government submitted to the House of Representatives a proposal that "with a view of facilitating the performance of the obligations imposed on Parliament by section 125 of the Constitution Act, it is expedient that a conference take place between the two Houses of Parliament to consider the selection of a seat of Government of the Commonwealth." This motion was passed by the House of Representatives, but was not concurred with by the Senate. On the 1st October, 1903, the Government introduced a "Seat of Government Bill" in the House of Representatives, with the result that after a ballot had been taken with a view to determining the opinions of members as to the place in New South Wales at or near which the seat of Government of the Commonwealth should be situated, Tumut was selected. The Bill as passed by the House of Representatives was read a second time in the Senate on the 14th October, 1903, and returned with the amendment of the substitution of Bombala in place of Tumut. The Bill as amended was considered in the House of Representatives, where, on the 20th October, 1903, the amendment by the Senate was disagreed with. The Senate, however, decided to insist upon the amendment referred to. It therefore appeared desirable to obtain further topographic, climatic, and other information regarding the proposed capital sites, particularly with reference to the relative merits of the Tumut and Bombala sites, and with these objects in view the Commonwealth Government secured from the Government of New South Wales the loan of the services of two surveyors, one of whom investigated the Southern Monaro district, the other the Tumut district. Both of these surveyors submitted their reports, accompanied by plans and statistical information, in May, 1904.

3. **The Seat of Government Act 1904.**—On the 15th August, 1904, the "Seat of Government Act 1904" was assented to. By this Act is was determined that the seat of Governnent should be within seventeen miles of Dalgety, in the State of New South Wales, and that the territory to be granted to or acquired by the Commonwealth, within which the seat of Government was to be situated, should contain an area of not less than 900 square miles and should have access to the sea.

At this juncture correspondence took place between the Governments of the Commonwealth and the State of New South Wales, with the object of obtaining the consent of the State to the provisions of this Act, and on the 22nd December, 1904, the Premier of New South Wales forwarded to the Prime Minister copies of resolutions passed by both Houses of the State Parliament to the effect that:—(*a*) The State would not grant 900 square miles in any part of the State. (*b*) The true intent of section 125 of the Constitution Act, as understood by that State, was that the area should be 100 square miles. (*c*) The Government was authorised to offer between 100 and 200 square miles at or near Tumut, Lyndhurst, or Yass. (*d*) The State was prepared to make provision outside such areas for water-supply. (*e*) The matter of railway construction should be carefully arranged, as the State was not prepared to enter into any large expenditure. Consequent upon these resolutions, correspondence, extending over a considerable period, took place between the Commonwealth and State Governments, more particularly respecting the technical interpretation of section 125 of the Constitution Act and the correct mode of procedure to be adopted by the Commonwealth and State in giving effect thereto, and finally a line of action was mutually agreed to between the two Governments.

4. **The Seat of Government Act 1908.**—On the 22nd September, 1908, the Minister of State for Home Affairs obtained leave to introduce a Bill for an Act to determine more definitely the seat of Government in the neighbourhood of Dalgety, and to provide for the acceptance by the Commonwealth of the territory and for other matters in relation thereto. This Bill was read a second time on the following day, and, after various ballots had taken place with the object of further determining the views of members as to the suitability of the several districts inspected, the Bill was passed by the House of Representatives with the substitution of Yass-Canberra for Dalgety. This alteration was approved by the Senate and the Bill was assented to on the 14th December, 1908. The chief provisions of this Act were (*a*) that the seat of Government should be in the district of Yass-Canberra in the State of New South Wales, (*b*) that the territory to be acquired by the Commonwealth should contain an area of not less than 900 square miles, and (*c*) that the territory should have access to the sea. Another important provision determined that the amount of compensation to be paid by the Commonwealth for the acquisition of any private lands within the territory should not exceed the value of the land on the 8th October, 1908, and that in other respects the provisions of the Lands Acquisition Act 1906 should apply. As already stated (see p. 1134 hereinbefore), all Crown lands must (under section 125 of the Consititution Act) be granted to the Commonwealth without any payment. The provision of the Act of 1908 just referred to is of considerable importance, inasmuch as, in the absence of this or any similar provision, the valuation of private lands, within the territory by the Commonwealth, would have to be effected under the Lands Acquisition Act 1906. The compensation to which the owner would be entitled under the latter Act would be the present value and not the value as at the 8th October, 1908.

Under the Act of 1908, the district in which the seat of Government is to lie was finally selected; it yet remained, however, to determine the actual territory for the seat of Government within that district, and to provide the machinery for the acquisition of such territory by the Commonwealth. The locality of the Yass-Canberra district may be seen on reference to the map given on page 1147.

§ 2. The Acquisition of the Territory.

1. **Territory as First Proposed.**—In order to enable the Commonwealth Government to decide on the most suitable territory for the purposes of the seat of Government within the Yass-Canberra district, a topographical investigation of that district was carried out early in 1909. In the first place a preliminary examination was made by a surveyor appointed for that purpose, and a report was issued as the result of this examination, stating that the site in the vicinity of Canberra approached nearer to what was required than any other in the Yass-Canberra district. Suggestions were also made as to the territory to be acquired by the Commonwealth, and it was recommended that such territory should include not only the site for the capital city, but also the catchment area (of the Cotter River) required for the domestic and civic water supply of the city, and the catchment areas (of the Molonglo and Queanbeyan Rivers) of the streams passing through the city site.

In March, 1909, an Advisory Board, consisting of four members, was appointed to consider the above report and to advise as to other matters requiring investigation. In the selection of the territory this Board gave prominence to certain essential qualifications and factors, viz.:—(*a*) contour and physical features; (*b*) area available; (*c*) aspect and shelter; (*d*) panoramic value; (*e*) railway facilities and approach; (*f*) facilities for classification of city areas; (*g*) ornamental water areas; (*h*) water-supply for domestic, power, and ornamental purposes; (*i*) environment and park lands; and (*j*) suburban settlement. The Board concurred with the conclusions arrived at as to the

suitability of the site for the capital city at Canberra, and also with the recommendations respecting the territory to be acquired by the Commonwealth. The Board further recommended (*a*) that the essential features of the proposed territory should be tested by actual survey; (*b*) that further investigation be made as to irrigation areas in connection with the disposal of effluent resulting from sewage purification; and (*c*) that a preliminary investigation should be made of practicable routes for a railway between the site and the sea coast. These last recommendations were duly carried out and a report was furnished advising that an area of approximately 1015 square miles should be acquired in the vicinity of Canberra, together with an area of about 2300 acres at Jervis Bay for the purposes of a Commonwealth port. This recommendation was adopted by the Commonwealth Government; the boundaries of the territory which it was at this stage proposed to acquire are indicated by the unbroken lines on the map on page 1148.

2. **Territory as Subsequently Agreed to.**—On the 20th July, 1909, the Prime Minister forwarded particulars of the proposed territory to the Premier of New South Wales, and invited him to take steps under section 111 of the Constitution Act* to pass a State Act for the surrender to the Commonwealth of sovereign rights over the territory comprising 1015 square miles, and to grant to the Commonwealth the area at Jervis Bay suggested for use in connection with the establishment of a Federal port. Correspondence ensued at this stage, and eventually a conference took place at Melbourne, with the result that the Premier of New South Wales submitted a proposal to the Commonwealth for the transfer of an area comprising 900 square miles, differing with the Commonwealth's proposal in the following particulars:—

(*a*) The exclusion of that portion of the catchment area of the Molonglo and Queanbeyan Rivers lying to the eastward of the Goulburn-Cooma railway line, over which area the Premier offered to secure to the Commonwealth water rights. This area, which comprises about 580 square miles, is shewn on the map on page 1148, and is indicated by the cross-hatched boundary.

(*b*) The addition to the remaining portion of the territory as proposed by the Commonwealth of an area of 465 square miles embracing the catchment areas of the Gudgenby, Naas, and Paddy's Rivers. The boundaries of this area are shewn on the map on page 1148 by the broken lines.

The territory thus suggested as the seat of Government is shewn on the map on page 1148, its boundaries being left free from cross-hatching. It may be seen that this territory (which, together with the area at Jervis Bay, has now actually been granted to and acquired by the Commonwealth) consists of two parts—(*a*) an area of about 435 square miles lying to the west of the Goulburn to Cooma railway and included in the original recommendation of the Advisory Board, and (*b*) a further area of about 465 square miles, including the catchment areas of the Gudgenby, Naas, and Paddy's Rivers. The total area of the territory is, therefore, approximately 900 square miles.

It may here be remarked that negotiations are now in progress between the Commonwealth and New South Wales Governments with a view to the acquisition by the Commonwealth of the catchment areas of the Queanbeyan and Molonglo Rivers. The Advisory Board regard it as essential that this area should be vested in the Commonwealth for the following reasons:—(*a*) To regulate the flow of the Molonglo River at the city site; (*b*) to prevent pollution; (*c*) to adopt measures for minimising turbidity; (*d*) to regulate flood waters; and (*e*) to provide an auxiliary source of water power.

3. **Agreement between Commonwealth and New South Wales Governments.**—On the 18th October, 1909, the Prime Minister of the Commonwealth and the Premier of

* This section provides as follows:—"The Parliament of a State may surrender any part of the State to the Commonwealth; and upon such surrender, and the acceptance thereof by the Commonwealth, such part of the State shall become subject to the exclusive jurisdiction of the Commonwealth."

New South Wales, subject to the approval of their respective Parliaments, agreed to the surrender by the State and the acceptance by the Commonwealth of the territory referred to in the preceding paragraph hereof, and made certain stipulations with respect to the surrender and acceptance of the territory.

The State of New South Wales agreed to surrender to the Commonwealth for the purposes of the seat of Government the territory therein described, and as shewn on the map on page 1149 hereof. The State also agreed to grant to the Commonwealth an area of two square miles for the purposes of a Commonwealth port, and in addition thereto certain other areas aggregating 2302 acres, which were considered necessary for the defence of the port. The State of New South Wales also granted to the Commonwealth:—(*a*) the right to construct, maintain, and work a railway from the territory to Jervis Bay; (*b*) The right to use the waters of the Snowy River or such other rivers as may be agreed upon for the generation of electricity for the purposes of the territory; (*c*) paramount water rights over the catchment areas of the Queanbeyan and Molonglo Rivers and their tributaries.

The State further agreed:—(*a*) To reserve from sale, lease, and occupation, except with the concurrence of the Commonwealth, all Crown lands in the catchment areas above referred to; (*b*) to protect from pollution the waters of the Queanbeyan and Molonglo Rivers; (*c*) in the event of the Commonwealth constructing a railway within the territory to its northern boundary, the State agreed to construct a railway from a point near Yass to join that railway.

4. **Seat of Government Acceptance Act 1909.**—On the 13th December, 1909, the Seat of Government Acceptance Act was assented to. This Act was expressed to commence on a date to be fixed by proclamation after the New South Wales Parliament had passed an Act notifying the agreement and surrendering the territory. The Acceptance Act confirmed the agreement (which was incorporated as a schedule to the Act), determined the site of the seat of Government, and authorised the Governor-General to declare by proclamation that on and from the proclaimed day the territory was accepted by the Commonwealth. It also made provision for the continuance in the territory, after its acquisition by the Commonwealth, of State laws and private interests in land and for the commencement of the administration of the territory by the Commonwealth.

On the 14th December, 1909, a similar measure entitled the Seat of Government Surrender Act was passed by the Government of New South Wales. This Act came into force by proclamation on the following day; it ratified the agreement and surrendered the territory to the Commonwealth.

5. **Proclamations Effecting Acquisition of Territory by Commonwealth.**—On the 20th January, 1910, a proclamation was issued by the Governor-General bringing the Seat of Government Acceptance Act into force on the 22nd January following. The effect of this proclamation was to bring the Act into force to the extent of enabling the Governor-General to issue a second proclamation vesting the territory in the Commonwealth. Prior to the issue of the second proclamation it was, however, considered advisable to secure further legislation in the direction of an Act to provide for the proper government and administration of the territory. The *Seat of Government (Administration) Act* was accordingly passed on the 25th November, 1910; the provisions of this Act are referred to in a later part of this section. On the 5th December, 1910, the second proclamation was carried vesting the territory in the Commonwealth on and from the 1st January, 1911.

§ 3. Physiography.

1. **General.**—The general locality of the Federal territory is shewn on the map on page 1147. The chief topographical features of the whole territory may be seen by reference to the map on page 1149, while those of the districts in the immediate vicinity of the city site are shewn on a larger scale on the map on page 1150. The total area of the territory is approximately 900 square miles, or 576,000 acres, of which it will be necessary to reserve from occupation the catchment area of the Cotter River, which has an extent of 170 square miles, or 108,800 acres. An area of about 12 square miles, or 7680 acres, has been set apart for the purpose of the city site, and it is proposed to reserve a further area of about 100,000 acres for parks, roads, military college, and other public purposes outside the city area, leaving 359,520 acres available for profitable occupation under reasonable conditions.

As regards accessibility, Canberra is 204 miles distant from Sydney, 429 miles from Melbourne, 912 miles from Adelaide, and 929 from Brisbane, from which it may be seen that the capital site is reasonably equidistant from the chief centres of population of the Commonwealth. As to access to the sea, it has been shewn that there is a practicable route for a railway between Canberra and Jervis Bay with a length of about 123 miles. To the north of the territory the country is open, and good roads lead to Yass (*via* Hall) and Gundaroo (*via* Sutton).

2. **Chief Topographical Features of Federal Territory.**—For topographical purposes the territory may be classified under four main heads:—(i.) The Canberra Ridge and Plain; (ii.) the Murrumbidgee Scarp; (iii.) the Paddy's and Gudgenby Rivers areas; and (iv.) the Cotter River catchment.

(i.) *The Canberra Ridge and Plain.* This area covers practically the whole of the territory lying to the east and north-east of the Murrumbidgee River. It is bounded on the north-east by the range forming the northern watershed of the Molonglo River and on the south and south-west (to within about eight miles south of Queanbeyan) by the Goulburn-Cooma railway. The area consists of ridges of about 2600 feet elevation running chiefly north and south, and alternating with plains of some 1800 feet; it is intersected by the Molonglo River, and includes the site which has been selected for the Federal capital city (see para. 3 below and maps on pages 1149-50). To the west of Queanbeyan, which is situated at the foot of the Jerrabombera Ridge, the valley opens out greatly, and in place of the hilly country on the eastward slopes of the Dividing Range, the landscape consists of a number of isolated knobs rising from very gently undulating pasture lands and of the ridges running down from the highlands of the Molonglo catchment. These are intersected by the winding course of the Molonglo River itself. There are five of these knobs in the immediate vicinity of the city site—Ainslie (2762 feet) lies to the north-east, Black Mountain (2658 feet) to the north-west, Mugga (2662 feet) to the south, and Taylor (2800 feet) and Stromlo (2570 feet) to the west—all rise about 900 feet above the Canberra plains. These knobs resemble volcanic cones, but they are in fact "residuals" of an older land surface of about 3000 feet level.

(ii.) *The Murrumbidgee Scarp.* This is a narrow ridge of country extending from almost as far north as the junction of the Murrumbidgee and Molonglo Rivers, along the west bank of the Murrumbidgee, to the south-western limits of the Federal territory. It comprises the area covered by the Bullen and Yarara Ranges, which rise to a height of 3084 feet at Castle Hill and to 4068 feet at Yarara, further to the south. A strong difference in the character of the two banks of the Murrumbidgee may be noticed and can be seen even on the rough contours shewn on the map on page 1149. The eastern bank is

low and undulating, and opens out into the Canberra and Molonglo plains, but the western bank is abrupt and continuous for many miles. Those tributaries of the Murrumbidgee which cut through the ranges on the west emerge through gorges several hundred feet in depth. The valley of the Murrumbidgee is constricted at two places, the Tharwa Gap (between Tennent and Rob Roy in the south) and the Urayarra Gorge (between McDonald and Stromlo in the north). These were formerly important crossings to the Gudgenby and Cotter areas respectively, but have since been supplied by the two Murrumbidgee bridges in the Federal territory. The Tharwa bridge is determined by the Old Divide forming suitable bluffs at each side of the river; the Urayarra bridge crosses the river at a place where a trenching of the main Murrumbidgee valley occurs.

(iii.) *The Paddy's and Gudgenby Rivers Areas.* These areas cover respectively the northern central and the southern central districts of the territory. To the west of the Murrumbidgee the character of the country changes somewhat abruptly. There are no flat plains with isolated knobs, but restricted valleys culminating in mountains rising to 4000 or 5000 feet. Paddy's River, with its tributaries the Tidbinbilla River and the Gibraltar and Blue Gum Creeks, flows into the Cotter River near the confluence of that river and the Murrumbidgee. Though it occupies a comparatively open valley at its head, it enters the Cotter by gorges a hundred feet or more deep. The Gudgenby, with its main tributary the Naas River, flows into the Murrumbidgee near Tharwa. The ridge of the hills constituting the catchment of the Naas River forms the lower western and southern boundaries of the territory for over 30 miles, the river itself running roughly parallel to the boundary. The contours of several of the various tributaries in the neighbourhood of Tharwa are quite abnormal, since many of these tributaries run into the main rivers in the wrong direction, *i.e.*, they run upstream. For example, the Gudgenby, Naas, and Chippendale tributaries are normal, but Sawyers' Creek, Booroomba Creek, Guises and Deep Creeks are all heading upstream at their several confluences.

(iv.) *The Cotter River Catchment.* Beyond the valleys of the Gudgenby and Paddy's Rivers are the precipitous valleys of the Cotter, separated from the country to the east by the 5000 feet ranges of Tidbinbilla. The catchment area of the Cotter River, from which the water-supply for the capital city is to be drawn, constitutes the western portion of the Federal territory. For many miles from its junction with the Murrumbidgee the Cotter is a narrow mountain stream, having a width of about 40 feet, the gradient of the bed being fairly uniform; it flows through a deep valley practically unoccupied, and, as no ring-barking of any moment has been done along its course, it is therefore unlikely that the water will be discoloured for a longer period than a few days. The upper reaches of the Cotter are still practically unknown. Only one or two surveyors and an occasional settler have ever been along the valley, which is completely uncharted. There are no roads, except that to the few farms at Brindabella (which is outside the Federal territory), and no settlements until Garrangobilly, on the main road between Tumut and Kiandra, is reached. In the ranges, surrounding the valley of the Cotter, are the mountains whose summits Coree (4657 feet), Tidbinbilla (5115 feet), McKeahnie (4904 feet), Bimberi (6264 feet), and Morgan (6144 feet) are amongst the highest in Australia. The Federal territory in fact extends to within 60 miles of Kosciusko (7300 feet), and includes a cluster of peaks over 5000 feet high, in addition to those mentioned.

3. **Topography of Capital Site.**—The locality of the site selected for the purpose of the Federal capital city is shewn on the map on page 1149; the topography of the site is shewn on a larger scale on page 1150. It is situated in latitude 35° 15′ S. and longitude 149° 15′ E. on the western side of the main Dividing Range; it is about 30 miles distant from that range and about 75 miles in a direct line from the eastern coast of Australia. The site may be described as a rectangular area, the eastern and western boundaries of the northern part resting on the slopes of Mount Ainslie and Black Mountain respectively, the southern boundary being intersected by the Narrabundah Range running from Mugga Mugga Mountain towards the Molonglo River. This river, which flows through the site

in a westerly direction, affords facilities for the conservation of water for ornamental purposes; it is joined by the Queanbeyan River at the town bearing that name and at a distance of some seven miles from Canberra. Through the latter place the river flows between low banks, giving everywhere an easy approach to the stream. The whole area is generally suited for building purposes, the feature contours being more marked, or bolder, on the south than on the north of the River Molonglo. The area set apart for the purpose of the city site covers approximately 12 square miles; this area was selected with a view to affording the fullest scope for the projection of the city design and the most effective location of the official centre.

The city will lie in an amphitheatre of hills, with an outlook towards the north and north-east, sheltered from both southerly and westerly winds, and in the immediate vicinity there are large areas of gently undulating country. The city will be visible on approach for many miles; the general contours of the country lend themselves to the purposes of effective city design, and streets with easy gradients can be readily laid out; prominent hills of moderate altitude present suitable sites for the principal public buildings. Some reference has already been made (see p. 1139 hereinbefore) to the nature of the country in the vicinity of Canberra. The comparative flatness of the landscape in the immediate foreground is broken by several conical hills arising from the Canberra plains and by the ridges running down from the highlands of the Molonglo catchment. The strike of these ridges is generally north and south; small tributaries, cutting the sides of the ridges, have converted them into picturesque features, while the pleasing effect of the outlook is still further enhanced by the graceful contours of the distant mountains.

No engineering difficulties oppose themselves to a satisfactory disposal of sewerage and effluent from treatment works. It will, however, be necessary to make provision for dealing with the storm waters, in which connection the general fall of the land favours a satisfactory scheme. There is a supply of perennially clear and pure water in the Cotter River, the catchment area of which embraces an area of about 170 square miles. According to recent records the supply of water at the point of gauging is sufficient for the domestic and civic requirements of a population of 200,000 persons based on a liberal scale.

(i.) *North of the Molonglo River.* The slopes towards the valley enclosed by these ranges culminating in Mount Ainslie and Black Mountain are at first abrupt, often rocky, sometimes precipitous, and clothed with an open forest of eucalypts, which extend to the junctions of the lower slopes with the gently undulating land and here and there projecting well out towards the centre of the valley. These two ranges are roughly three miles apart, the steeper slopes extending for a distance of about half a mile on either side, a narrow stretch of moderate inclination abutting upon the wider area of gentle undulation, which is relieved at intervals by elevated points rising some fifty feet above the general level. The soil in this valley is everywhere adapted for arboriculture, and much of it is of high quality suitable under modern methods of cultivation for the growth of crops.

(ii.) *South of the Molonglo River.* South of the Molonglo River the contour of the country is irregular, the Narrabundah Range, which culminates in Mugga Mugga (2662 feet), running in a north-westerly direction to Red Hill (about 2360 feet); here there is an almost abrupt descent to a level of about 2100 feet and beyond this point the range divides into a number of radiating spurs. On the Narrabundah Range and its subsidiary spurs down to the 1950 feet level there is an open forest of eucalypts, the average height of the trees being about 50 feet. No prominent watercourses flow through this area. Arboriculture will present no difficulty over any part of this land, for even on the higher rocky points there is a fair growth of trees.

(iii.) *The Molonglo River.* This river is ordinarily a sluggish stream; it drains some 700 square miles of country, and within and near to the city site it flows between

steep banks formed by the erosion of the alluvial plains at Canberra. During periods of prolonged drought the river ceases to flow; it is readily fordable at many places during the greater part of the year.

(iv.) *Shelter.* The largest areas sheltered from the most objectionable winds lie to the south of the Molonglo on the eastern side of the Narrabundah range and its tributary spurs; more restricted sheltered area lies on the east of Black Mountain.

(v.) *Range of View.* (*a*) *North of the Molonglo River.* Looking from the more elevated points on the northern site of the Molonglo River—such as Vernon Trigonometrical Station—towards the north, the view extends over a very gently undulating valley for some miles to the low range of timbered hills forming the northern boundary of the territory. Mount Ainslie, Black Mountain, and Majura, rising some 900 feet above the general level, are prominent features in the landscape.

Looking to the west and south-west through the gap between Black Mountain and the spurs from Red Hill on the Narrabundah Range, successive ranges are visible, in which there are various peaks attaining an altitude of from 4000 to 6200 feet above sea-level; these peaks are frequently snow-clad during the winter months. In the middle distance there are undulating pasture lands, relieved by the timbered slopes on either side of the Molonglo River, and by hills of pleasing contour rising some 500 feet above the general level. In the foreground flows the Molonglo River, bordered by willows. Southerly the view is limited by the Narrabundah Range, but towards the south-east the outlook extends over the alluvial reaches of the Molonglo as far as the timbered ranges lying to the east of the Goulburn-Cooma railway.

(*b*) *South of the Molonglo River.* On the south of the Molonglo, looking from Camp Hill, the view towards the north is somewhat similar to that from Vernon Trigonometrical Station, but here the Molonglo is in the foreground and its winding course can be traced on either hand for many miles. In the middle distance the Canberra church and parsonage, encircled by well-grown plantations, are prominent objects. Turning towards the north-east, the scene is varied; near the foot of Mount Ainslie lies Duntroon homestead with its garden and ornamental grounds; beyond the homestead glimpses of farms with undulating pastures are obtained, while the forest-clad ranges on both sides of the Molonglo form an effective background. Towards the east and south-east the country is of graceful contours with here and there a farm, the Goulburn-Cooma railway in the distance ascending the lower spurs springing from the main Dividing Range. Looking to the south, Mugga Mugga stands out prominently, and the Narrabundah Range as far as Red Hill limits the view.

4. **Geology of Capital Site.**—A geological survey of the site selected for the capital city has been carried out. The rocks composing the site consist of a somewhat contorted and folded sedimentary series of sandstones and quartzites, shales, slates, limestones, and volcanic tuffs. Igneous intrusions occur, consisting principally of quartz-porphyries and quartz-felsites. The sedimentary rocks, more especially the limestones, contain fossil corals, brachiopoda, and trilobites, indicating the age as Upper Silurian.

(i.) *Sandstone and Quartzite.* One of the most noticeable features of the city site is the occurrence of thick beds of buff-coloured sandstone, which occupy a considerable area, including Black Mountain at the north-west corner of the site. These sandstones have been used locally to some extent for building, for which purposes they are not, however, of first-class quality. Small quarries have been opened only in two or three places, and therefore the question as to whether a better quality of building stone is obtainable or not cannot be said to have been definitely decided.

Near their contact with the intrusive igneous rocks (referred to hereinafter) the sandstones have been transformed into dense quartzites, and all traces of their bedding planes have been entirely obliterated.

(ii.) *Shales and Slates.* Interbedded with the sandstones are certain thin-bedded shales, which, for the most part, are yellow, but in places, owing to the presence of peroxide of iron, they assume a chocolate colour. Deposits of bluish fissile slates also occur within the city area. So far as can be seen by their limited exposures these slates are not of sufficiently good quality to be utilised as roofing slates, though it is probable that careful prospecting may result in the discovery of deposits suitable for door-steps, paving stones, and other analogous purposes.

(iii.) *Limestones.* Beds of limestone are numerous within the city area and the surrounding territory, though none of the individual deposits is remarkable for its thickness; the most extensive in regard to length occurs along the northern slope of Red Hill, while the thickest beds observed are on the northern side of the Molonglo River. Most of these limestones appear, from their analyses, to be of good quality for the manufacture of mortar and hydraulic cement.

(iv.) *Calcareous Tuffs.* In proximity to the limestones of Red Hill occur beds of a calcareous tuff, which presents features of some interest. It consists of a dense, fine-grained, bluish rock of considerable hardness, which presents a banded and much corroded appearance when weathered. Analyses of several samples of this rock shew that it contains various proportions of carbonate and silicate of lime, so that it may be regarded as a more or less siliceous substance. This fact has suggested the possibility of the tuff being useful in connection with the manufacture of hydraulic cement.

(v.) *Crystalline Tuffs and Lavas.* At the north-eastern corner of the site there is a complex area (including Mounts Ainslie and Russell) consisting of crystalline volcanic tuffs, tuffaceous shales, and lavas; some of these tuffs are very coarse in texture, containing angular inclusions up to an inch in diameter, while others are almost indistinguishable from the quartz porphyries which are imbedded in them.

(vi.) *Igneous Rocks.* A well-defined belt of igneous rocks, principally quartz-porphyries and quartz-felsites, stretches from north-west to south-east across the city area. These, intruding the sedimentary series, tilt and contort the beds, and convert the sandstones in many places into quartzites. The quartz-porphyry has characteristics which will make it valuable as an ornamental building stone. The matrix is of a dark bluish-green colour, and is interspersed with crystals of quartz and felspar, and is similar in texture, hardness, and durability to a medium-grained granite. It appears probable that Mount Mugga Mugga will be the most suitable locality for a quarry, having in view the quality of the rock at that place and its proximity to the centre of building operations.

(vii.) *General Suitability.* Finally it may be said that the general geological conditions of Canberra are favourable for the purposes of city construction. The prevailing rocks are, without exception, suitable for the foundations of heavy structures, and would offer no insuperable difficulties in the construction of tunnels and pipe-lines for sewerage, or of surface reservoirs for water-supply purposes.

5. **Meteorology.**—Meteorological observations have not been taken on the capital site itself over a sufficient number of years to enable a proper appreciation of climatic elements to be arrived at. At Queanbeyan, however, which is only 8 miles distant from the capital site, rain records have been taken since September, 1870; at Duntroon since 1896; and at a number of other places near the capital site for various periods. Particulars of rainfall and temperatures, as recorded at Queanbeyan, have already been given in this book (see page 111).

(i.) *Rainfall.* The average rainfall for the whole of the Federal territory has been computed by the Commonwealth Meteorologist to be 25.5 inches, or about that of Melbourne or London. The following table gives particulars of the rainfall recorded at several places near the capital site:—

COMMONWEALTH SEAT OF GOVERNMENT.—RAINFALLS RECORDED AT PLACES NEAR CAPITAL SITE.

Station.	No. of Years.	Average.	Greatest.		Lowest.	
			Year.	Amount.	Year.	Amount.
		Inches.		Inches.		Inches.
Duntrooon	13	18.73	1900	28.94	1902	11.09
Kiandra	35	64.04	1889	90.06	1908	42.18
Lake George	25	27.00	1887	42.11	1908	15.90
Queanbeyan	39	22.63	1887	41.29	1902	10.42
Red Hill	23	33.93	1887	49.66	1902	18.94
Uriarra	15	32.92	1887	54.11	1899	20.00

The highest recorded average rainfall within the Federal territory is 32.92 inches at Uriarra, and the lowest, 18.73 inches at Duntroon. It is stated, however, that neither of these records can be accepted as accurate. At Queanbeyan the average rainfall is 22.63 inches; as much as 41.29 inches were registered at that place in 1887, and as little as 10.42 inches in 1902, a range of over 30 inches. The average rainfall in the city site itself is estimated to be 21.80 inches per annum. This equals or exceeds that recorded at the following places:—Berlin, Budapest, Christiania, Copenhagen, Madrid, Marseilles, Moscow, Naples, Paris, San Francisco, Stockholm, St. Petersburg, and Vladivostock.

No official records have been taken within the Cotter catchment area, but it is estimated that the average rainfall cannot be less than from 40 to 60 inches per annum, since Kiandra, which is only a few miles distant, has an average of 64 inches and is exposed to the same rain-bearing winds, while it has the disadvantage of being some 500 to 1000 feet lower than many of the peaks which serve as condensing or precipitating agents for the Cotter River. If the records of Kiandra can be taken as a guide, it follows that the precipitation on these higher levels does not suffer the extreme annual variations to which the lower levels of the Federal territory are susceptible, so that the flow of the Cotter River may reasonably be regarded as both fairly uniform and constant.

(ii.) *Temperature and other Matters.* The meagre temperature data so far obtained over the capital site leave many phases of weather inconclusive. Taking Queanbeyan as representative, the mean annual temperature may be assumed to be 55° Fah., the summer mean 68°, and the winter 42°. The maximum shade temperature recorded at Queanbeyan is 104°, the minimum 11° Fahr.; the ordinary summer temperatures are high, while the nights are invariably cool. During winter the temperature frequently falls below freezing point; the minimum record for 1910 is 26°, but that winter was exceptionally mild. The prevailing winds during the winter months are from points west of the meridian, and since those from the south, south-west, and west pass over the snow-clad Alps, they are keen. During the summer, hot winds from the west and north-west alternate with cool winds from the south, while the frequent north-east winds from the ocean are refreshing and serve to modify the summer temperature. It is rare for snow to fall within the city site, and still more rare for it to remain unthawed for more than a few hours after sunrise. Fogs are neither frequent nor dense. Observations of evaporation, and other climatic elements are not available for a sufficiently long period in order to form a reliable estimate of normals, other than those of rain and temperature.

A meteorological station was established in 1910 on the capital site and the following instruments installed:—evaporation tank, thermograph, barograph, hygrograph, aspirator, rain gauge, anemometer, and sunshine recorder.

6. **Vegetation.**—The timber line in the Federal territory is a fairly well marked feature, and, in the neighbourhood of the city site, roughly corresponds to the 2000 feet

contour. Below this line the country is open and almost without timber—partly naturally, and partly artificially. Above the line the country is generally timbered with eucalypts of moderate size.

One of the most urgent matters in connection with the Federal territory is that of re-afforestation. The steep slopes of many of the ridges are covered with loose material composed of a mixture of boulders and soil. This is held together normally by the tree roots, and nourishes not only the trees, but also a certain amount of pasture. After the trees have been ring-barked and cut down the roots decay, and there is nothing to prevent the loose soil washing down into the gullies. Owing to the destruction of the timber in many places on the steep face of the west bank of the Murrumbidgee, the soil is washed away too quickly for grasses to grow. The waters rush down rapidly to the creeks and bring about an alternation of floods and dry creeks, instead of more normal conditions. The discolouration of the Molonglo River is also largely due to ring-barking within the catchment area. The question of the re-afforestation of the Federal territory is under consideration, and is referred to hereinafter.

7. **Soils and Agriculture.**—The rocks which usually afford the richest soils—shales and basic rocks—are not present in notable quantity. Hence the country is chiefly a pastoral one. Wheat is, however, grown along the river banks, especially to the south of the Molonglo, and loads of potatoes are brought in from the Paddy's River area. Maize is grown successfully, and dairy farming is carried on to a limited extent.

There are considerable areas of gently undulating land well adapted for fruit-growing, and with proper cultivation ordinary farm crops could be profitably grown; apparently holders have found it easy to make a living by grazing and have, therefore, avoided as far as possible the more strenuous life that cultivation demands.

There is but little mining carried on within the territory. A copper mine near Bullen has been worked intermittently, and there are some old alluvial gold workings near the north-east corner of the city site. The similarity of the conditions prevailing at Canberra and at Pambula (near Twofold Bay), where rich chutes of gold have been extracted, suggests the possibility of workable deposits of gold occurring in the felsite rocks at the first-named locality.

It is intended to encourage farming in suitable districts by persons having small means, and to cultivate small irrigated holdings by the conservation of the waters of the Queanbeyan and Molonglo Rivers, which have a combined catchment area of 580 square miles. By this means it is proposed to employ a considerable agricultural population on the soil at various branches of industry, including agriculture, mixed farming, fruit-growing, and market gardening.

The present Government proposes not to alienate any of the lands in the territory, either within the city area or outside it, but to lease them on reasonable terms. It is anticipated that the revenue to be derived from these rentals in the earlier stages will total £30,000 a year, but with the development of the city, the rent-roll will be considerably augmented.

Over practically the whole of the city area the soils contain a large percentage of sand, and, though rarely of high quality, they give satisfactory results with careful treatment; the land is usually well drained naturally, and there is an almost total absence of marsh.

8. **Jervis Bay.**—The territory on the south side of Jervis Bay acquired by the Commonwealth includes (*a*) an area of about two square miles as described in the first schedule to the Seat of Government Acceptance Act 1909; (*b*) an area of 132 acres, known as Bowen Island, described in the same schedule; and (*c*) six other areas aggregating 2270 acres, also described in the schedule. The New South Wales Government has been

officially requested to agree to the extension of these areas for the reasons (*a*) that it is requisite to secure further lands on the coast line for the purposes of efficient defence, and (*b*) that it is desirable that the Commonwealth should have proprietary rights over the catchment area of Telegraph Creek and other adjacent lands.

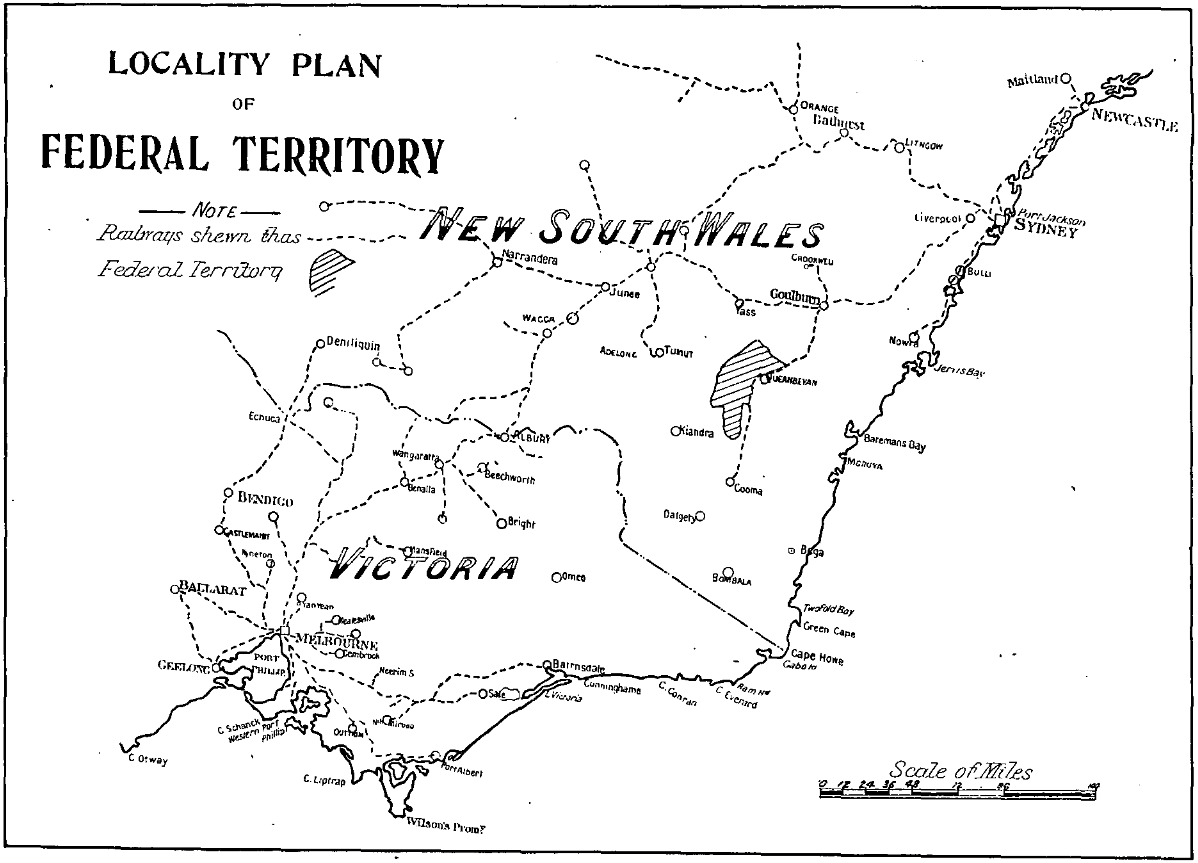
The entrance to Jervis Bay, between Bowen Island and Point Perpendicular, is 1¾ miles in width. The main Federal territory is situated on the southern side of the bay, at what is known as Darling Road, where there is a good anchorage on a sandy bottom, carrying a depth of from 6 to 11 fathoms of water at low-water spring tides. The 5-fathom line comes close up to the shore, and there is nothing less than 11 fathoms thence to the ocean. The sheltered area of Darling Road may be taken to be about 1½ square miles, and it affords an excellent shelter for vessels of even the largest draught.

§ 4. Administration and Organisation of Services.

1. **General.**—By section 6 of the Seat of Government Acceptance Act 1909, it is provided that all laws in force in the Commonwealth territory, at the date of acquisition by the Commonwealth, shall, so far as applicable, remain in force until other provision is made. Power is given to the Governor-General to exercise certain functions hitherto vested in the Governor of New South Wales, subject to the proviso that the Governor-General may direct that any such function shall be exercised on behalf of the Commonwealth by the authorities of the State in whom it was previously vested. Before issuing the proclamation actually effecting the acquisition of the territory it was thought desirable to make further provision for the administration of the territory by the Commonwealth. The Seat of Government (Administration) Act was accordingly passed in November, 1910.

2. **The Seat of Government (Administration) Act 1910.**—This Act, which came into force on the 1st January, 1911, provides for the government of the territory and deals with the following matters:—(*a*) *Ordinances.* The Governor-General is authorised to make ordinances having the force of law in the territory, either House of Parliament being empowered, however, to disallow any such ordinance by passing a resolution to that effect. (*b*) *State Acts.* It is provided that certain State Acts should not continue in force in the territory. These Acts are as follow:—The Conciliation and Arbitration Act 1899, the Industrial Disputes Acts 1908 and 1909, the Local Government Acts 1906 to 1908, the Country Towns Water and Sewerage Act 1880, and all acts imposing rates, taxes, or duties (except duties on the estate of deceased persons). (*c*) *Commonwealth Acts.* It is also provided that the following Commonwealth Acts should apply within the territory:—The Commonwealth Conciliation and Arbitration Acts 1904 to 1910, the Australian Industries Preservation Acts 1906 to 1909, and the Secret Commissions Act 1905. The rates of postage and for telegrams are the same as if the territory were still part of New South Wales. (*d*) *Crown Lands.* The freehold of any Crown lands in the territory cannot be sold or disposed of except in pursuance of some contract entered into before the 1st January, 1911. (*e*) *Jurisdiction of Inferior Courts.* The inferior courts of the State of New South Wales exercise the same jurisdiction as they had before the commencement of the Act.

3. **Ordinances.**—Up to the end of March, 1911, only one ordinance had been made under the provision referred to above. This ordinance, which came into operation on the 1st January, 1911, deals with the provisional government of the territory. It directs that the State laws are to continue to be administered by the authorities of the State, and that magistrates, gaolers, and police are to be deemed to be officers of the territory. No new


LOCALITY PLAN
OF
FEDERAL TERRITORY
NOTE
Railways shewn thus
Federal Territory
NEW SOUTH WALES
VICTORIA
Maitland
NEWCASTLE
Port Jackson
SYDNEY
Liverpool
Bulli
Nowra
Jervis Bay
Batemans Bay
Moruya
Bega
Twofold Bay
Green Cape
Cape Howe
Gabo Id
Orange
Bathurst
Lithgow
Narrandera
Junee
Wagga
Goulburn
Yass
Crookwell
Tumut
Adelong
Queanbeyan
Kiandra
Cooma
Dalgety
Bombala
Deniliquin
Echuca
Albury
Wangaratta
Beechworth
Benalla
Bright
Bendigo
Castlemaine
Kyneton
Mansfield
Omeo
Ballarat
Yan Yean
Healesville
Melbourne
Pembrook
Neerim S
Port Phillip
Geelong
Bairnsdale
Cunninghame
L. Victoria
Sale
C. Conran
C. Everard
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Western Port
Outtrim
C. Liptrap
Port Albert
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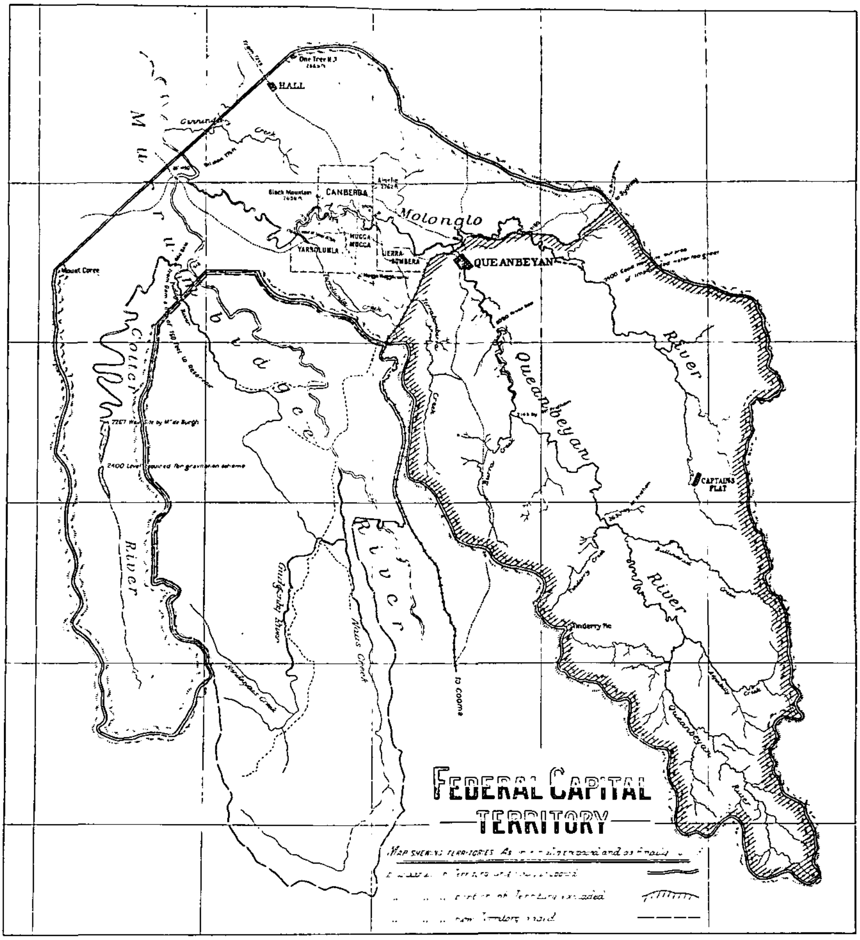
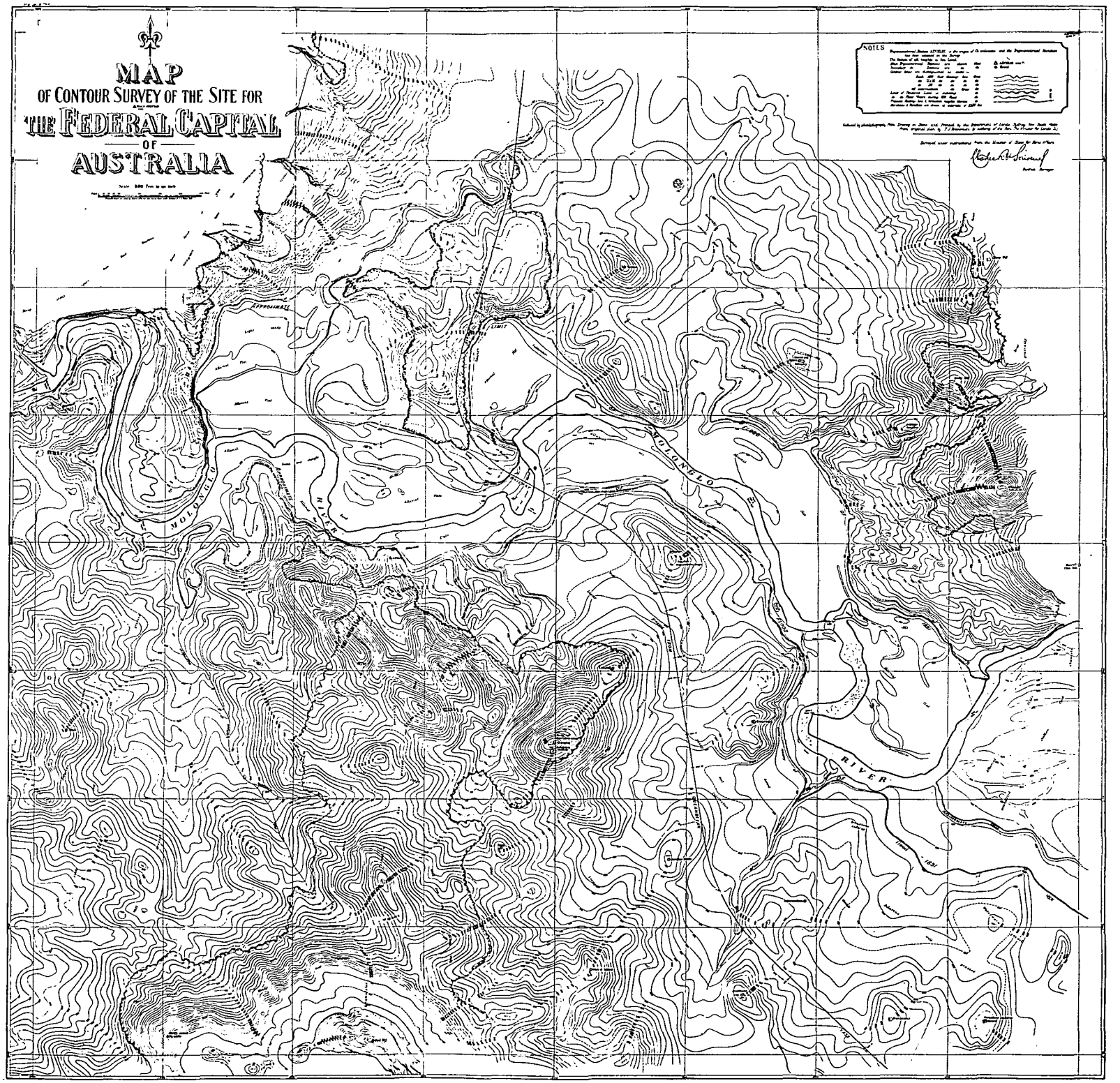
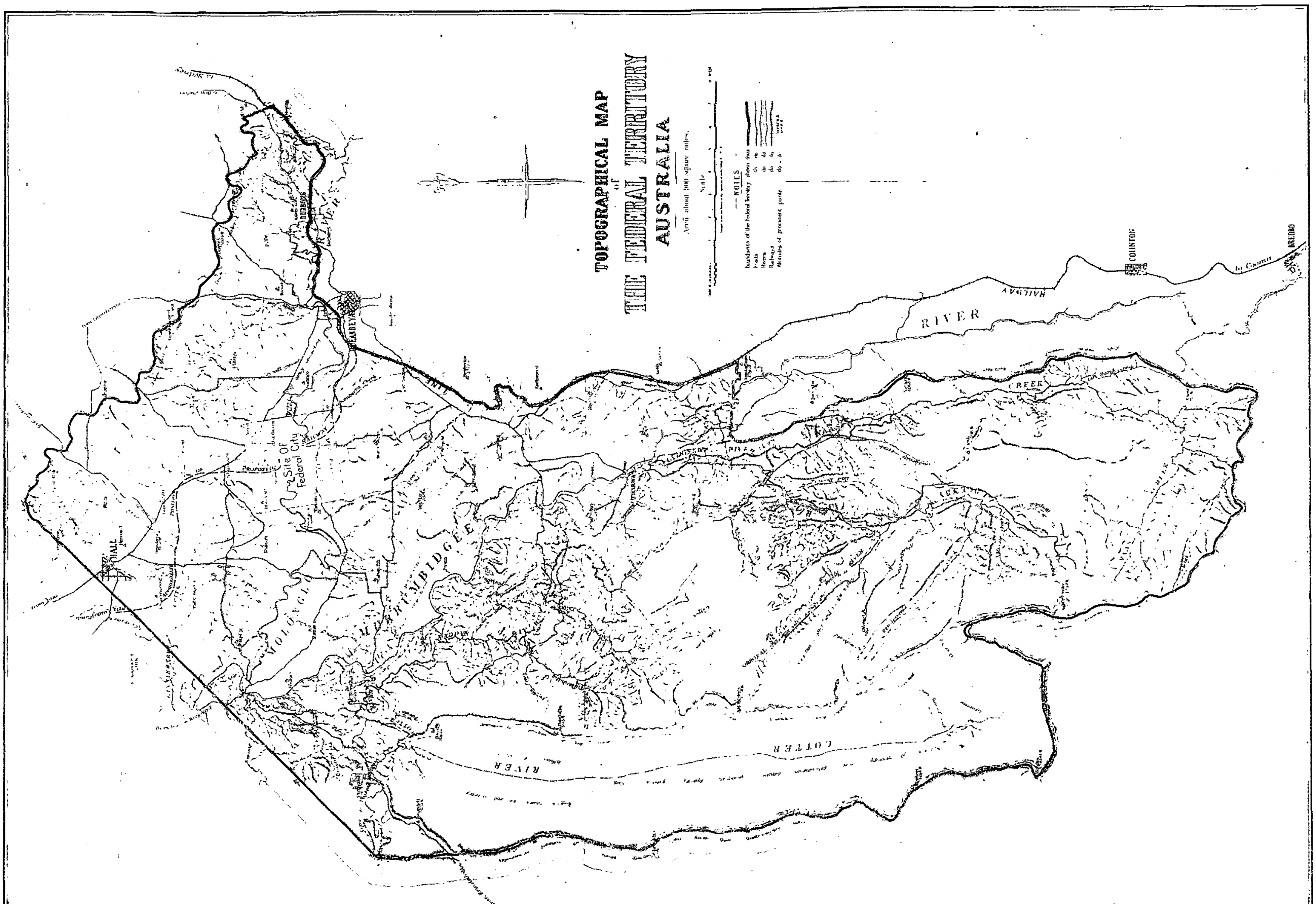

FEDERAL CAPITAL
TERRITORY
HALL
CANBERRA
Black Mountain
YARROLUMLA
MUGGA MUGGA
JERRABOMBERA
QUEANBEYAN
CAPTAINS FLAT
Mount Coree
Molonglo
Queanbeyan
River
Cotter
River
Tinderry Pic
to Cooma


MAP
OF CONTOUR SURVEY OF THE SITE FOR
THE FEDERAL CAPITAL
OF
AUSTRALIA
NOTES
MOLONGLO
MOLONGLO
RIVER
RIVER


TOPOGRAPHICAL MAP
of
THE FEDERAL TERRITORY
AUSTRALIA
Scale
NOTES
RIVER
RAILWAY
CREEK
COTTER
RIVER
MURRUMBIDGEE
MOLONGLO
Site Of Federal City
HALL
COLINTON
BREDBO

license to sell intoxicating liquor in the territory may be granted; any existing publican's license may, however, be renewed from time to time for the same premises.

It is proposed to pass Commonwealth Acts providing a complete scheme for the government of the territory, as the opportunity and necessity arise. In the meantime it is intended to make other ordinances at an early date dealing with various urgent matters; it is understood that the first of these will relate to the local government of the territory by the Commonwealth.

4. **Financial and Other Arrangements.**—A trust fund, to be designated the Federal Capital Territory Account Trust Fund, is to be created by statute. Into this fund all moneys collected by the New South Wales Government on behalf of the Commonwealth in connection with the Federal territory will be paid. Disbursements on account of operations in the territory will be made out of this account, subject to appropriation by Parliament.

In order to enable the Commonwealth to undertake the administration of lands, roads, forests, mines, and allied services, now being conducted by the State on behalf of the Commonwealth, steps have been taken to obtain (*a*) certified copies of the registers of the State Lands Department, with full particulars relating to every area of land within the territory; (*b*) certified copies of every measured portion of land in the territory, and of all plans thereof deposited in the Government offices; (*c*) copies of the registers of the Yarrolumla shire shewing every holding within the territory, these being required before any scheme of municipal taxation can be introduced; and (*d*) information relating to land tenure and Local Government Acts of the State.

5. **Scheme for Organisation of Services.**—In January, 1910, approval was given by the Minister of State for Home Affairs of a general scheme for the organisation of services under the Seat of Government Act 1908, and the Seat of Government Acceptance Act 1909. This scheme provides for responsibility to the Minister for the administration of the various Acts to be passed in connection with the territory and the city, for the general management, for the conduct of operations, for orders, and for the receipt of intelligence.

(i.) *Administrative Arrangements.* It is proposed to divide the administrative arrangements into two sections:—(*a*) The drafting of Bills and the administration of Acts relative to city, lands, mines, agriculture, forests, stock, justice, police, education, health, works, roads, buildings, transport (including railways), power, lighting, water, sewerage, bridges, rivers, parks, harbour, observatories, and miscellaneous; (*b*) the other section of administration covers general management, embracing correspondence, records, stores, finance, revenue, and expenditure.

(ii.) *Executive Arrangements.* The primary division of the executive section of the services provides for (*a*) lands, (*b*) works, and (*c*) scientific. (*a*) *Lands.* The lands section has been placed under the control and supervision of the Director of Commonwealth Lands and Surveys, and embraces all survey operations regarding city, triangulation, engineering, territorial boundaries, topographical, roads, railways, and miscellaneous. That officer is also charged with duties relating to Crown lands, valuations, acquisitions, leases, roads, parks and reserves, agriculture, mines, and forests. (*b*) *Works.* The Public Works section of the scheme has been placed under the control and supervision of the Director-General of Works, who advises on professional matters respecting the design, construction, and maintenance of works. These works embrace public buildings, water, power, lighting, sewerage, roads, bridges, railways, and tramways. (*c*) *Scientific.* It is proposed to place scientific services under the control of a Director, who will advise the Minister respecting the various observatories which will be established in connection with the Federal capital, such as astronomy, solar physics, meteorology, etc.

§ 5. Surveys.

1. **General.**—After the acquisition of the territory and the selection of the city site, the first step to be taken towards the establishment of the capital city is the carrying out of a large number of necessary surveys. These comprise (*a*) contour surveys; (*b*) triangulation survey of the territory; (*c*) demarcation of the boundaries of the territory and the catchment areas; (*d*) engineering surveys for water-supply, sewerage, roads, bridges, and other associated objects; (*e*) topographical or feature surveys of the territory and of the catchment areas of the Molonglo and Queanbeyan Rivers, comprising in all an area of about 1480 square miles; (*f*) road surveys; (*g*) surveys in connection with the Yass-Queanbeyan railway; (*h*) demarcation of boundaries of lands at Jervis Bay; (*i*) surveys in connection with the railway line to connect the capital city with Jervis Bay, and the establishment of a harbour at Jervis Bay; (*j*) redetermination of boundaries of privately-owned properties in the territory; (*k*) preparation of plans and descriptions of the whole of the foregoing surveys. These surveys are being carried out under the direction of the Commonwealth Director of Lands and Surveys.

2. **Astronomical Observatory.**—In connection with these surveys it is in the first place important to observe that the site for an astronomical observatory has been located on the summit of a range of hills, known as Mount Stromlo, about 6 miles south-west of the city site, and situated symmetrically with regard to the eastern and western boundaries of the territory. The primary object in fixing this site is the determination of the initial meridian, to which all surveys, including not only those within the Federal territory but also ultimately throughout Australia, will be referred. A point on the summit of this range has been determined as the origin of all co-ordinates for the surveys which are to be carried out.

The site on Mount Stromlo was selected after due consideration of the conditions essential for the efficient employment of powerful astronomical instruments during the greater part of the year, viz., uninterrupted horizon, clear skies, transparency and steadiness of atmosphere, and freedom from dust, smoke, and frequent atmospheric disturbances. The elevation of the site—about 2570 feet above sea-level and 600 feet above the surrounding country—secures an uninterrupted horizon. On the top of the range there is ample room for the location of several observatories, and taking into account the advantages of the site—such as its relative remoteness from sea influences, the moderate gradient of the slopes on all sides, the nature of the soil and vegetation, and the aspect and general topography of the surrounding country—the elevation of 2600 feet is considered to probably afford a sufficient degree of atmospheric purity.

There are ranges some 20 or 30 miles to the south-west of the capital site having an elevation of from 4000 to 5000 feet, but the difficulty of obtaining access to these higher levels outweighs any advantage which the additional elevation might be expected to give.

Arrangements are being made for the erection on the site of a temporary observatory to house an equatorial telescope, having a 9-inch objective, in order to test the efficiency of the site by actual observations of astronomical and meteorological phenomena, extending over a period of at least twelve months.

3. **Progress of Surveys.**—As may be seen below a considerable amount of work has already been done in regard to the surveys which are to be carried out.

(i.) *Contour Surveys.* The first contour survey was carried out in 1909 and extended over an area of about 35 square miles; the object of this survey was to give a general idea of the character of the country about the city site. A close

contour survey, with vertical intervals of five feet, has now been carried out over the area embraced by the city site, for the purpose of enabling designs for laying out the city to be prepared. This survey has recently been extended beyond the city site so as to include the areas proposed for the water-supply reservoirs and pipe-line and sewerage-treatment works, as well as the sites for weirs on the Molonglo River. A model of the city site on a scale of 400 feet horizontal and 100 feet vertical has been prepared. Casts of this model will be sent to each of the centres from which information is to be distributed to intending competitors for the premiums offered for designs for laying out the city (see § 6, para. 5 hereinafter).

(ii.) *Triangulation and Demarcation of Boundaries.* The triangulation of the territory and the demarcation of boundaries are now being conducted, and it may be observed that an arrangement has been made with the Government of New South Wales under which the common boundaries, as determined by the Commonwealth Director of Lands and Surveys, will be accepted by both Commonwealth and State. The triangulation of the territory will be intermittent, and surveyors will be detailed for that work as circumstances warrant. Similarly, topographical work will not be continuous, but will be carried out, when the more urgent surveys have been completed.

(iii.) *Surveys for Engineering Works.* The surveys in connection with engineering works for water-supply and sewerage have been made, and investigations are in progress with a view to determining the characteristics of certain sites which it is proposed to utilise for reservoirs, weirs, and other engineering purposes. A survey has also been carried out for a road from the foot of Mount Stromlo to the observatory site on the summit. This road is to be constructed at an early date with a length of 2¼ miles and a ruling gradient of 1 in 20. Other surveys recommended by the Director-General of Works in connection with roads and bridges are also being carried out.

(iv.) *Railway Surveys.* A preliminary survey has disclosed a practicable route for a railway from the capital site to the Goulburn-Cooma line near Bungendore, with a ruling gradient of 1 in 75 and easy curves. This line will form part of the railway which will connect the capital city with Jervis Bay, as well as being the most direct route from the city site northwards, *i.e.*, to Sydney, Brisbane, etc.

a) Capital Site to Bungendore. The length of the line from the city site to Bungendore will be about 27 miles, of which 11 miles are within Federal territory and 16 miles in the State of New South Wales. It is estimated that the cost of construction of this line will be approximately £250,000 without equipment. The New South Wales Government has been invited by the Commonwealth Government to state the terms upon which they will be prepared to construct, equip, and maintain the line in such a manner as to conform to the standards of the State lines.

In order to provide transport facilities to the city site at an early stage in the operations, the original proposal was to connect the site with Queanbeyan, a distance of 9 miles. The line between Queanbeyan and Bungendore has, however, a gradient of 1 in 40 for more than 7 miles and curves of 12 chains radius, with short intervening straights extending over 2½ miles. Disregarding the question of cost and interest on capital expenditure, the deviation to Bungendore would therefore place the railway transport to the city site on a more satisfactory basis than would exist by connection with Queanbeyan.

(*b*) *Yass to Queanbeyan.* Reference has already been made (see page 1138) to the provision in the agreement between New South Wales and the Commonwealth for the construction of this line, which would pass through the Federal territory near the city site. A location survey of the route for this line is in progress, and the permanent marking of part of the line, which will pass through the Commonwealth territory, has been completed.

(c) *Railway to Jervis Bay.* A route for a railway to Jervis Bay, connecting with the line from the city site to Bungendore, has been selected, and location surveys are to be carried out. The length of the proposed line is approximately 96 miles, with a ruling gradient of 1 in 50 and curves of 12 chains radius as a minimum. The only bridges of any size will be those across the Shoalhaven and Mongarlow Rivers; smaller bridges will be required crossing Reedy and Durra Durra Creeks and the Coorang River. The descent towards Jervis Bay is gradual, the highest point being at the departure from the Goulburn-Cooma railway at 2550 feet above sea-level.

4. **Determination of Boundaries and Particulars of Land Tenure.**—Amongst other matters which are in train may be mentioned the valuation of privately owned properties lying within the territory, with reference to which the New South Wales Government has furnished a detailed statement shewing the nature of each occupation together with certain information in the possession of the State Department bearing upon the values of the properties. Particulars regarding the tenure of land within the Federal territory are given in the following table :—

COMMONWEALTH CAPITAL TERRITORY—PARTICULARS OF TENURES OF LAND, 1911.

Particulars.	Alienated.	In Process of Alienation.	Leases and Licenses.	Unoccupied.	Total.
Area in acres ...	163,447	147,180	195,033	67,021	572,681

§ 6. The Building of the City and Associated Matters.

1. **Preliminary Measures.**—Whilst the foregoing survey operations are being performed and the designs for laying-out the city are being prepared (see paragraph 5 hereinafter), it is proposed that the preliminary schemes for workmen's habitations, water-supply, sewerage, and other necessary works should be carried out for the necessities, not only of the city itself in its earlier stages, but also for the large number of persons who will be engaged on its construction.

(i.) *Accommodation of Workmen.* Arrangements for housing the employees engaged on the preliminary works and for controlling the area occupied by them are being made. At present the officers engaged in the surveying work under the direction of the Director of Commonwealth Lands and Surveys are established in camps. For the purpose of providing in a suitable position an area upon which these officers and other persons engaged in the establishment and construction of the city will reside, the estate known as Acton, covering an area of 1780 acres on the north side of the Molonglo River, has been acquired. This area was selected with due regard to hygienic conditions and to protection of the site from pollution. During the earlier stages, workmen will probably be distributed on engineering works away from the city site, but from the time when construction within the city begins, there will be an aggregation of a considerable number of men, their families, and dependents.

When this stage arrives, it is proposed to lay out the area referred to as a semi-permanent village. The streets will be formed and drained; cottages erected for married men and families; and accommodation provided for single men. Immediate steps are to be taken for the erection of offices and quarters for the staff. It is also proposed to

establish a general store, where all consumable supplies may be purchased. A hospital is also to be provided and equipped, the medical officer in charge to act also as health officer. The establishment of a Government hotel and the provision of schools for the education of children are also in view.

(ii.) *Transport.* Steps are to be taken for the early construction of a railway connecting the capital site with the Goulburn-Cooma line, either at Bungendore or at Queanbeyan. The construction of such a line will facilitate the supply of materials, plant, stores, and provisions, and will thus decrease the cost of engineering and building construction, and of workmen's living. In the initial stages it may be found necessary to construct a tramway from Queanbeyan for transport purposes until the railway is opened, such tramway to follow the route of, and be a permanent step towards, the line connecting Yass and Queanbeyan. The formation of main roads and deviations, and the maintenance and repair of existing roads and bridges for the transport of material required in connection with the earlier engineering projects, is to be taken in hand immediately. The roads in use in the territory are approximately 200 miles in length; about one-half of these are formed and gravelled in parts, the other half having natural surface with slight formation. There are four bridges—two each over the Murrumbidgee and Molonglo Rivers—constructed of timber. The main roads are to be reformed and gravelled or metalled; the necessary road-making plant is being purchased. A sum of £8000 has been made available for expenditure during the current financial year on road maintenance, and a further sum of £540 has been provided for the construction of a road to the observatory site on the summit of Mount Stromlo. A scheme is to be prepared for an efficient system of roads, throughout the Federal territory, radiating from the city site.

(iii.) *Water-supply and Sewerage.* It is proposed that a provisional scheme for water-supply and sanitation should be carried out at an early date, so that the men who will be engaged on the construction of the permanent water-supply and sewerage systems, of roads, bridges, railways, and other works, will be provided for in a manner which will meet all requirements in the direction of health, and which will not in any way interfere with the site upon which the capital itself will eventually stand. At a later stage, when these permanent works are sufficiently advanced and when construction within the city site commences on a large scale, a water-supply system will probably be adopted so as to form a permanent step towards the water-supply of the city upon official occupation. Similarly, in regard to sewerage, at first the arrangements will probably be more or less of a temporary nature, but it is proposed that the engineering works should be pushed so far ahead before building operations in the city are commenced, as will admit of a location being assigned for workmen, which will, in course of time, become a sewage district for the city extensions. The question of water-supply for afforestation will also receive early consideration.

(iv.) *Afforestation.* It is proposed to take steps at an early date for the afforestation of that part of the territory contiguous to the city site, in such a manner as not to interfere in any way with the design of the city. By being planted and properly laid out at an early date, the trees will be in a forward state by the time the capital city is ready for occupation. The scheme includes the growth of trees for scenic and ornamental purposes, for the prevention of the erosion of the banks of rivers and creeks, and for shelter. It appears probable that concurrently with the foregoing operations it will be found advantageous to commence some of the constructional works for the lake which is to be formed by utilising the waters of the Molonglo River at the capital site. It is proposed to obtain expert advice as to a scheme of afforestation and to establish local nurseries for the trees which will be used.

(v.) *Materials.* Steps are being taken with a view to the supply of local materials as far as possible. Shafts have been sunk and samples of shale, which it is thought will be

suitable for the purpose of brick making, have been obtained. Tests of these samples are being carried out in Sydney and Melbourne, and the establishment of brickworks is awaiting the results of these tests. The type of brick being made is the machine-made brick, treated by the semi-dry process. It is estimated roughly that ninety million bricks will be required for the public buildings; the delivery of these will probably be accomplished within six years after the erection of the brickworks, *i.e.*, at the rate of fifteen million bricks per annum. It is stated that there will be no difficulty as to the volume of shale available. Reference has already been made (see § 3, para. 4.) to the nature of the building stone available in the territory; further investigations are to be made. Granite occurs in large quantity over a great part of the territory; none has yet been used for buildings, but it is probable that, with the demand created by the establishment of the capital city, suitable quarries will be opened, while the porphyritic rock which outcrops frequently will no doubt provide valuable stone for ornamental purposes. Stone for road-making is abundant and quarries will be located; sand for building construction and pottery clays will be sought for. The question of the manufacture of sand lime bricks from local materials is under investigation.

Early steps will probably be taken for the delivery and seasoning of timber required for preliminary works. At a later date this scheme will be developed so as to provide the timber required for buildings in the city.

(vi.) *Power.* Power will be required in the early stages of the work for lighting, brickmaking, woodworking, pumping, possibly quarrying, and other purposes. It is therefore considered desirable that prior to the inception of active operations a power station should be installed to transmit electrical energy according to requirements. The project will be considered as part of a comprehensive scheme and will be installed in units.

(vii.) *River Gauging.* A complete system of river gauging throughout the territory and the catchment areas of the Molonglo and Queanbeyan Rivers is to be established.

2. **Probable Successive Stages of Works.**—A scheme, setting forth the proposed successive stages of the works involved in the establishment of the capital city, has been prepared by the Director-General of Works. Although the entire undertaking does not involve any one engineering work of great magnitude, it is necessary that the successive steps should be planned in such a manner that each may become a permanent step obviating temporary expedients. It is also necessary that the whole undertaking should be designed so that certain projects may initially form units or parts, which can be repeated or developed in course of time to meet increase of population. The probable stages in the evolution of the city, as set out hereunder, may overlap, and in some cases projects will continue through successive stages.

(i.) *First Stage. Transport, Materials, and Power.* Country roads and bridges; railway connection with Goulburn-Cooma line; brickworks; lime kilns; and timber (first instalment); generation and transmission of power for construction.

(ii.) *Second Stage. Hydraulic Engineering Works outside City Area.* Water-supply; storm-water drainage; sewerage outfall works; main sewer; sewerage district for workmen; timber (second instalment); railway bridge over the Molonglo River.

(iii.) *Third Stage. Engineering Works within the City Area preparatory to Occupation.* Street tunnels; power plant (permanent station and distribution); construction of housing for workmen; service reservoirs; and impounding weir on Cotter River.

(iv.) *Fourth Stage. Building Construction within the City and Completion of Engineering Works.* Public buildings (offices for use during construction); gasworks;

compensating weir on Queanbeyan River; railway to Hall (Queanbeyan to Yass line); impounding weir on the Molonglo for ornamental water; erection of public offices and buildings; erection of Parliament House; completion of city roads.

3. **Outline of Principal Projects.**—A provisional scheme has been formulated setting out the sequence of most of the important projects involved in the building of the city, together with the estimated time necessary for their design and completion, and their approximate cost. There are, however, certain matters which cannot be dealt with even provisionally at present—such as bridges over the Molonglo River and the impounding weir on that river for ornamental purposes—since the location and height of these will depend upon the level of the waters provided for in the accepted designs for laying out the city. Other important works, *e.g.*, the compensating weir on the Queanbeyan River, street tramways, the railway to Jervis Bay, and refuse destructor, are not included in the scheme, since it is considered that they are not essential for the first years of occupation. The scheme provides, subject to the approval and the appropriation by Parliament of the necessary funds, for the completion of the designs and buildings ready for occupation within a period of eight years.

(i.) *Water Supply.* There are two aspects of this matter, viz., one as regards workmen during construction, the other regarding the supply for the city. The former has already been referred to herein (see page 1151). It is proposed that a supply from the permanent source, the Cotter River, shall be provided before the time when there will be any considerable aggregation of workmen and dependents within the city area. In the meantime a supply of water will be provided for the men engaged on preliminary works, probably by pumping from the Molonglo River through sand filters into reservoirs. A weir has been erected on the Cotter River, and the discharge is determined by readings taken daily. The records thus obtained have confirmed the reports which have already been made to the effect that the capacity of the river is more than sufficient for the domestic and civic requirements of a population of 200,000 persons, based on an estimate of 100 gallons each per diem. A site for an impounding weir on the Cotter River has been selected at a place about one mile from the confluence of that river and the Murrumbidgee, and at a level of about 1560 feet. It is estimated that a weir at that place, 70 feet in height, will impound 800 million gallons of water; if the height were increased to 200 feet, the quantity impounded would be 4800 million gallons. The pipe line, after crossing the Murrumbidgee River, will lead to the pipe head reservoir on a hill near Mount Stromlo (2465 feet), thus necessitating a lift of about 800 or 900 feet. The proposed site for the service reservoir is at Red Hill (2300 feet), near the south-western boundary of the city site. It is proposed that the power for the pumping plant shall be transmitted electrically from the central power station.

(ii.) *Sewerage Scheme.* Various considerations demand that efficient measures should be taken to ensure the innocuous disposal of the sewage effluent. Any system adopted will involve land filtration, and the configuration of the country indicates the slopes of the Molonglo below (*i.e.* to the west of) the city site as the most suitable place for sewage treatment works. It is proposed that a system of bacteriological treatment combined with broad irrigation shall be adopted.

Until the designs for laying out the city are accepted, the lowest levels from which sewage will be taken cannot be determined, but it is stated that the engineering surveys, which have already been carried out, demonstrate that the areas available for irrigation by gravitation alone will be too small, and that pumping will be necessary. The lift required will, however, be small even to command a large irrigable area. The relative advantages of pumping the sewage or effluent are under consideration.

(iii.) *Power Supply and Distribution.* In distinction to a system under which independent power-generating units would be installed at various places—for example, at

the sewage outfall works and at the pumping station at the Cotter—the adoption of a central station scheme is of importance. It is proposed that the permanent central station shall consist of two generating units each of 500 kilowatts, and one spare unit. Until a proper water-supply is provided, the permanent power station cannot be erected. In the meantime, since power supply is necessary in connection with preliminary measures (see page 1152 hereinbefore), it is proposed to install the first unit in a temporary building on the bank of the Molonglo River, conveniently situated for condensing and feed water. When the permanent station is erected, the first unit will probably be moved from the temporary building and become part of the complete plant.

The question of the generation of electricity by water-power has received consideration. None of the rivers within the territory can be regarded as a suitable source for such power, because of the large capital outlay entailed for hydraulic headworks and the small horse-power which could be relied upon during successive years of drought. It is considered probable that in future years, when the population of the city has substantially increased, the current for a plant of large capacity could be economically generated by the utilisation of the waters of one of the rivers flowing outside the Federal territory.

(iv.) *Buildings.* The scheme provides for the sequence of designs and for the erection of public buildings without intermission, including the Governor-General's residence, Courts of Justice, police buildings and gaol, administrative offices, military depôt and offices, schools, observatory, medical and hospital buildings, railway station, Prime Minister's residence, accommodation for Members of Parliament, post office, Government printing office, and Town Hall. Other buildings will probably be erected within the first few years of, but not prior to, occupation, such as State House and necessary educational institutions. It has been decided that competitive designs should be invited for Parliament House after the design for laying-out the city has been selected (see paragraph 5 hereinafter). The plans will probably have to be designed in such a manner that initially the necessary buildings can be erected expeditiously and at moderate cost, and so as to form a permanent part of the whole design to be completed at a later date.

The scheme provides for the design and erection of public buildings only. It is proposed that buildings for commercial and residential purposes should be constructed by private enterprise, at a time when the engineering and other works of the city are considered to be sufficiently advanced.

(v.) *Gasworks.* It is considered that gas-supply for cooking and heating will be essential, and that such a supply will also be utilised to a large extent for lighting purposes. It is proposed, therefore, to produce a gas of calorific value suitable for modern lighting, as well as for heating and power. On the basis of available statistics regarding towns having both electric and gas supplies, the consumption for 20,000 people, including town street lighting, will be 80 million cubic feet per annum.

(vi.) *Compensating Weirs on Queanbeyan and Molonglo Rivers.* The proposal to construct a weir to impound ornamental waters in the city site will entail the erection of compensating weirs on the Queanbeyan and Molonglo Rivers. It is considered that the construction of one of the latter weirs should preferably precede that of the impounding weir at the city, and that it would be advantageous to first construct the weir on the Queanbeyan River. The area of the ornamental water will presumably be determined by the accepted city design, but in any case a constant flow of water will be required to maintain a definite level and to avoid so far as possible still waters in any arms or bays. The evaporation losses, deduced from the data obtained at Lake George, will be considerable, as also will be the loss by soakage. The requisite flow cannot be definitely stated until the extent of ornamental water is determined. In the meantime a weir is

being constructed to gauge the flow of the Molonglo at a reef near Yarrolumla station, so as to afford data by the time the designs for the city are under consideration.

(vii.) *Other Matters.* Other matters (in addition to the foregoing and to the preliminary measures specified in paragraph 1 hereof) dealt with in the scheme comprise lime-kilns, storm-water drains, military college, street tunnels, and city streets.

4. **Military College of Australia.***—This college has been established under the authority of the Defence Act 1910, to educate candidates for commissions in all arms of the Military Forces of the Commonwealth. A site within the Federal territory has been selected for the college at the Duntroon homestead, on the right bank of the Molonglo River, about seven miles from Queanbeyan, and near to the eastern boundary of the capital city area. The site, which comprises an area of about 370 acres, has a frontage to the Molonglo River, and has at present been leased by the Commonwealth for a period of two years with a right of renewal for a similar period. It will be possible to obtain within about twelve miles of Duntroon an additional area of country near the Murrumbidgee River suitable for encampment purposes, where field-artillery practice, field-firing, and other practical exercises can be carried out.

The homestead at Duntroon has been converted into offices for the administrative staff, orderly rooms, and quarters and mess-rooms for bachelor instructors. Temporary barracks and mess accommodation have been erected for the cadets, class rooms have been provided, and a parade ground constructed. The college is eventually to be connected with the water-supply and sewerage systems of the city; in the meantime temporary arrangements have been made.

(i.) *Cadets.* The establishment of cadets has been fixed at 150. The first batch will number thirty-three Australian cadets and ten from New Zealand, and will join in April, 1911. The next batch will go into residence in March, 1912.

(ii.) *Commandant and Staff.* The college is under the control of a Commandant. The staff consists of the following officers:—

MILITARY COLLEGE OF AUSTRALIA—STAFF OF OFFICERS, 1911.

Instructional.		Administrative.
Military.	Civil.	
2 Directors 6 Instructors	5 Professors 2 Lecturers	1 Adjutant 1 Quartermaster 1 Medical Officer

Warrant and non-commissioned officers will also be appointed.

5. **Designs for the Capital City.**—The Commonwealth Governmen is inviting competitive designs throughout the world for laying out the capital city, with the object of embodying in the construction of the Federal capital the most desirable features from the standpoint of general efficiency for its purposes, of engineering, hygiene, etc. The city will be the permanent seat of Government of the Commonwealth, the place at which the Federal Parliament will meet, where all Commonwealth legis-

*Compiled from information kindly furnished by Brigadier-General W. T. Bridges, C.M.G., R.A.A., Commandant of the Military College of Australia.

lation will be enacted, and where the Governor-General will have his official residence. It will therefore be primarily the official centre of the Commonwealth.

The creation of a capital is a unique opportunity, and it is hoped to reflect in the designs thereof the finest features of modern cities. The Commonwealth will have, as a precedent in the undertaking, the whole experience of the past in architecture and city planning. With the object of inducing experts of world-wide celebrity and reputation to place their talent at the disposal of the Commonwealth Government, it has been decided to award premiums of £1750, £750, and £500, respectively, for the three designs considered most meritorious. The whole of the necessary preliminary work, viz., survey and contouring, preparation of plans, etc., has already been undertaken, and the results are to be placed at the disposal of competitors; the conditions and particulars for the competition are accompanied by such plans, reports, and other exhibits as are necessary to enable the competitors to gain a full appreciation of all requirements. The information comprises historical notes, conditions of competition, requirements, general information, descriptive matter, and statistics relating to meteorology and climatology, together with contour, topographical, geological, and meteorological maps, a model of the city area, special reports, and also reproductions of landscape sketches taken from marked positions within the city site. The special consideration of designers is to be given to the allocation of appropriate areas suitably situated for public buildings and offices, and for commercial, residential, and industrial purposes, and it is expected that competitors will embody in their designs all recent developments in the art of town planning from the utilitarian, the architectural, the artistic, and scientific standpoints.

Information for the guidance of intending competitors will be available free of cost at the following places:—*Australia*: The Department of Home Affairs and the Public Works Department of each State. *New Zealand:* Public Works Department, Wellington. *Canada:* Public Works Department, Ottawa. *South Africa:* Public Works Department, Pretoria and Cape Town. *Paris, Berlin, and Washington:* The British Embassy. *New York and Chicago:* The British Consul-General. Applicants must establish their bonâ fides as intending competitors before being supplied with information.