Angus & Robertson's Australian School Manuals

GEOGRAPHY

OF

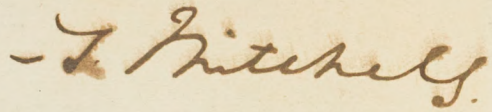
NEW SOUTH WALES

BY

J. M. TAYLOR, M.A., LL.B.

With 82 Illustrations, Maps and Diagrams.

USE IN SCHOOLS BY THE DEPARTMENT OF INSTRUCTION, NEW SOUTH WALES.



RELIEF MAP OF NEW SOUTH WALES.

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NEW SOUTH WALES

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With 32 Illustrations Maps and Diagrams

Prescribed for use in Schools by the Department of Public Instruction New South Wales

SYDNEY

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LIST OF ILLUSTRATIONS.

In order to see the full detail of the illustrations, roll a sheet of foolscap or a piece of newspaper into the shape of a tube, and view them through it.

MAPS.

GEOGRAPHY

OF

NEW SOUTH WALES.

Name.—Captain Cook, in 1770, gave the name of *New South Wales* to the eastern coast of Australia, because it appeared to him to resemble the southern shores of Wales, with which his previous career as a sailor in the British coasting trade had made him intimately acquainted. On the 26th January, 1788, the eastern portion of the continent was erected into a colony, with Captain Phillip as its first Governor. The erection of the Port Phillip District in 1851 and of the Moreton Bay District in 1859 into the colonies of Victoria and Queensland respectively considerably reduced the territorial extent of the colony as laid down in Governor Phillip's commission, and the term New South Wales is now restricted to that portion of Eastern Australia lying eastward of the 141st meridian, and having a seaboard extending from Point Danger (lat 28° 10′ S.) to Cape Howe (lat. 37° 28′ S.)

Boundaries.—New South Wales lies almost entirely between the 29th and 37th parallels of south latitude, and between the 141st and 154th meridians of east longitude. It is bounded on the *North* by QUEENSLAND, on the *South* by VICTORIA, on the *East* by the SOUTH PACIFIC OCEAN, and on the *West* by SOUTH AUSTRALIA.

The *northern* boundary line in detail runs as follows:—(i.) From Point Danger westward along the Macpherson Range to the junction of the latter with the Great Dividing Range at Wilson's Peak; (ii.) thence along the Great Dividing Range southward till it reaches a spur running westward to the junction of Tenterfield Creek and the Dumaresq River is reached; (iii.) from this point it follows the crest of the last-named spur; and (iv) is continued successively along the Dumaresq and Macintyre Rivers to the 29th parallel of south latitude, and thence along that parallel to its intersection with the 141st meridian. The *southern* boundary has the following course:—(i.) An imaginary line drawn from Cape

 Kerry, Sydney.

CAPTAIN COOK'S STATUE, HYDE PARK, SYDNEY.

Howe to the source of the river Indi at the foot of Forest Hill (situated a few miles south of The Pilot, one of the most conspicuous peaks of the Australian Alps); (ii.) thence along the course of the Indi, and afterwards of the Murray,* westward to the 141st meridian. That portion of the South Pacific Ocean lying between New Zealand and the islands north-west of it on the one hand, and the eastern coasts of Australia and Tasmania on the other, has in recent years received the name of the Tasman Sea. This name has been printed on the Admiralty charts since 1891, and was adopted on the suggestion of the Council of the Australian Association for the Advancement of Science. That portion of the 141st meridian of east longitude between the parallel of 29° S. and the Murray River forms the line of separation between New South Wales and South Australia.

Extent.—The **area** of New South Wales is 310,367 square miles. Its **greatest length** measured diagonally from Point Danger to the south-west corner, where the Murray passes into South Australia, is 850 miles; its **breadth** from east to west along the 29th parallel is 760 miles; and its **coastline** is 700 miles.

CAPES.

The coast of New South Wales is, on the whole, singularly regular and unbroken. It consists of a succession of rugged cliffs and sparkling sandy beaches, broken at frequent intervals by crescent-shaped bays and wide river estuaries. Its general trend is from north-east to south-west, through about four degrees of longitude, from Point Danger, in longitude 154° E. (nearly), to Cape Howe, in longitude 150° E. Few capes project into the sea more than a few hundred yards, and the navigation of the coast is rendered very easy by the absence of dangerous reefs and currents, while light-houses have been erected by the Government (at a total cost of a quarter of a million pounds sterling) on all the more prominent headlands.

Proceeding from north to south along the coast the chief headlands are:—

Point Danger, a rocky promontory standing boldly out into the sea, and forming the most northerly point on the coast. It was so named by Captain Cook on account of the neighbouring shoals, into the vicinity of which he was brought back by the current after sailing beyond them.

* In 1855, by an Imperial statute, it was enacted that the whole watercourse of the Murray, from its source to the eastern boundary of South Australia, "shall be within the territory of New South Wales."

Fingal Point, near the Tweed River, provided with a fixed white light visible 12 miles.

Cape Byron, a rocky promontory, two miles in length, the most easterly point of Australia. From a distance it looks like an island. It was named after Admiral Byron, grandfather of Lord Byron, the poet.

Evans Head, between the Richmond River and Shoal Bay.

Clarence Heads, at the mouth of the Clarence River, provided with a fixed light visible 10 miles.

Smoky Cape, near Trial Bay. It was so named by Cook, who saw dense volumes of smoke rising from it as he sailed past. A lighthouse (with a triple-flashing white light visible 27 miles, and a subsidiary red light overlooking the dangerous Fish Rock) stands on Smoky Cape.

Korogoro Point, *Crescent Head*, and *Point Plomer*, between Trial Bay and Port Macquarie.

Tacking Point, about two miles south of Port Macquarie, provided with a fixed white light visible 12 miles.

Indian Head, near Camden Haven, so named by Cook, because he saw a crowd of blackfellows on it.

Crowdy Head, about eight miles north of the Manning River, and affording shelter for coasters from S.W. and S. winds. It consists of massive grey sandstone more or less horizontally bedded, and is provided with a fixed white light, showing red over Mermaid Reef.

Cape Hawke, a bold headland near Wallis Lake, and six miles north of Sugarloaf Point.

Sugarloaf Point (sometimes called *Seal Rock Point*), near Myall Lake. It has a revolving white light visible 22 miles, with a subsidiary green light over the Seal Rocks.

Point Stephens, at Port Stephens, provided with a revolving red-and-white light visible 17 miles. In Nelson's Bay, close by, there is a fixed white light.

Nobby's (once an island, but now connected with the mainland by a breakwater about half a mile in length) marking the entrance to Newcastle Harbour. On it is a fixed white light visible 18 miles, while red and green lights are placed on the breakwater.

Red Head, a prominent bluff between Newcastle and Lake Macquarie.

Bungaree Norah, near the entrance to the Tuggerah Lakes.

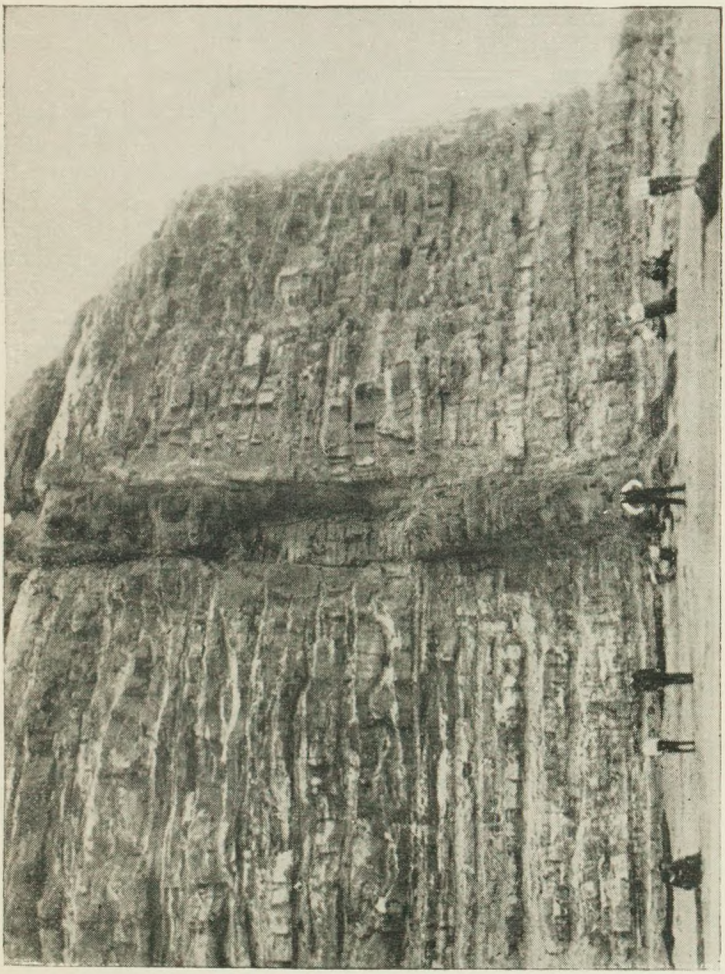


Photo. by Rev. J. Milne Curran. NOBBY'S—NEWCASTLE.
(Shewing Basaltic Dyke intruding upwards through Coal Measures.)

Broken Bay Heads (*Box* or *Hawke Head* on the north, and *Barranjoey* on the south), at the entrance to Broken Bay, the estuary of the Hawkesbury. On Barranjoey there is a fixed red light visible 15 miles. Nearly equidistant from the heads, and at some distance in from the sea, stands Mount Eliot

(commonly called Lion Island), a bluff island, resembling the figure of a gigantic lion.

Long Reef, a few miles north of Port Jackson Heads, near Narrabeen Lagoon.

Port Jackson Heads, at the entrance to Sydney Harbour. On the highest part of South Head, overlooking "The Gap," where the *Dunbar* was wrecked in 1857, stands the Macquarie Lighthouse, provided with a revolving electric light, one of the most powerful in the world, and visible over 30 miles. Another lighthouse, the Hornsby, with a fixed light, stands on much lower ground inside South Head at the entrance of the harbour proper.

Cape Banks and *Cape Solander*, the north and south heads respectively of Botany Bay. The former was named after Sir Joseph Banks, who sailed with Cook to Australia, and the latter after Dr. Solander, the botanist of the expedition.

Port Hacking Point, at the southern entrance to Port Hacking.

Clifton Head, rising abruptly from the sea, about five miles north of Bulli. It marks the commencement of the Illawarra Range.

Red Point, a low, bare rocky projection named by Cook, a few miles south of Wollongong.

Point Bass (known locally as *Long Point*) in the Illawarra district, a few miles north of Kiama. It was named after George Bass, who, with Matthew Flinders, explored much of the coast south of Sydney.

Black Head, a bluff headland near Gerringong.

Point Perpendicular, a rocky promontory forming the north head of Jervis Bay. It stands out boldly as a sheer cliff 275 feet high. A lighthouse is being erected on this headland.

St. George's Head, a rocky promontory forming the south head of Jervis Bay. It was so named by Cook, who passed it on St. George's Day, 1770. Near this cape is a stone tower with a revolving light, exhibiting at intervals of 30 seconds red, green, and white lights in succession, visible from a distance of 14 miles.

Point Upright, a lofty rocky headland a few miles north of Bateman's Bay, described by Cook as "a point of land which rose in a perpendicular cliff."

Tathra Head, at the mouth of the Bega River.

Green Cape, a long promontory south of Twofold Bay, and 15 miles north of Cape Howe. It is provided with a revolving white light visible 19 miles. It was on this headland that the ill-fated *Ly-ee-Moon* was wrecked in 1886.

Cape Howe, the most southerly cape of New South Wales. The white light of its lighthouse is visible 17 miles.

ISLANDS.

The islands adjacent to New South Wales are few and small. They consist of rugged, weather-beaten rocks, the haunt of numerous sea-fowl, and for the most part lie close to the shore, of which in times past they probably formed a portion. The chief are :—

Cook Island, near Point Danger.

Juan and *Julia Islands*, about 1½ miles north of Cape Byron.

Solitary Islands, a series of rocky islets between the Bellinger and Clarence Rivers. On the South Solitary the Government has erected, at a cost of £30,000, a splendid lighthouse, the most expensive on the coast.

North Coff's Island, *South Coff's Island*, and *Mutton Bird Island*, near Coff's Harbour.

Seal Rocks, so called from the number of seals found there, a mile and a half to the south-east of Sugarloaf Point.

Broughton Islands, the largest on the coast, a few miles north of the heads at Port Stephens.

Bird Island, near Tuggerah Lakes.

Five Islands, a group of five small islands a little to the south of Wollongong.

Montague Island, 18 miles south-east of the Moruya River estuary. It is the site of a lighthouse built of granite found on the island. From this island were obtained the fine granite columns on the Pitt-street side of the Sydney Post Office.

Gabo Island*, lying off Cape Howe, is a low, desolate, surf-beaten rock, on which stands a fine lighthouse, with the houses of the keepers, telegraph operators, and signal men nestling at its base. The Gabo light is visible 17 miles out at sea, and from the station the names of passing vessels are telegraphed to all the Australian capitals.

**Gabo* is merely a corruption of *Cape Howe*.

In addition to the above, NORFOLK ISLAND and LORD HOWE ISLAND, although not geographically belonging to New South Wales, have for the purposes of government been attached to it.

Norfolk Island lies in the Pacific Ocean, about 1200 miles N.E. of Sydney, and nearly midway between New Zealand and New Caledonia. It is 5 miles long, 2½ miles broad, and covers an area of about 13 square miles. Its coasts are high and broken, its surface is generally even, but it rises in Mount Pitt to upwards of 1000 feet above sea-level. The island was discovered by Cook in 1774, and used as a penal settlement by New South Wales almost continuously up to 1856, when it was handed over to the Pitcairn Islanders by the British Government. It possesses a good climate and fertile soil, which yields bananas, onions, potatoes, and other vegetables, which the inhabitants export to New Zealand, besides supplying passing vessels. The population of the island is about 800, and the affairs of the settlement are administered by a resident magistrate appointed by the New South Wales Government.

Lord Howe Island lies in the Pacific Ocean, about 360 miles off the coast of New South Wales, opposite Port Macquarie. It was discovered in 1788 by Lieut. Ball, in H.M.S. *Supply*, when on his way from Port Jackson to found a settlement on Norfolk Island. It is of volcanic origin ; is 7 miles long, 1½ miles broad, and has an area of 5 square miles. The coasts rise precipitously from the sea, and *Mt. Gower* in one of its volcanic ridges reaches 2840 feet in altitude. The soil is rich and the vegetation profuse, and the population numbers about 50. This island is visited three times a year by a magistrate appointed by the New South Wales Government. For electoral purposes the people of the island belong to the King division of Sydney.

INLETS AND HARBOURS.

At intervals along its 700 miles of seaboard New South Wales has some fine natural harbours, one of which, Port Jackson, stands unrivalled for its extent, beauty, and shipping facilities. Two others, Port Stephens and Broken Bay, are little inferior to Port Jackson, while several small ports, estuaries, and roadsteads afford abundant facilities for trade, and are safe harbours of refuge from the perils of the sea. Many of the rivers have sandbars at their mouths, which often make it difficult to enter them ; but of late years this evil has been greatly reduced by dredging operations, carried on at the expense of the Government. Besides this, extensive training walls have been constructed in many places to increase the scouring effect of the tides and the river outflow, and thus bring about the removal of the bars. At Sydney and Newcastle there are lifeboat stations, and at the various pilot stations whaleboats fitted with cork linings are in readiness for rescue work. Shipping disasters are not of frequent occurrence on this coast; those that

occur are generally among vessels of less than 100 tons burthen, larger vessels being rarely wrecked unless they have been carelessly navigated.

Proceeding along the coast from north to south the chief indentations are :—

Byron Bay, inside Cape Byron. It affords safe anchorage except against north-easterly gales, and is useful as a haven of refuge for vessels trading between Sydney and the Queensland ports. A large pier has been built to facilitate shipping.

Shoal Bay, the estuary of the Clarence River. It is a safe and commodious harbour, although the size of vessels entering it is limited by the depth of water on the sand bar. Chatsworth, Harwood, and Palmer's Islands are situated at the head of the bay.

Trial Bay, at the mouth of the Macleay River. It affords ample shelter and safe anchorage. A large breakwater is in course of construction to provide increased shipping facilities.

Port Macquarie, the estuary of the Hastings River, and a commodious harbour.

Camden Haven, between Port Macquarie and Crowdy Bay.

Crowdy Bay, between Camden Haven and the Manning River.

Harrington and *Farquhar Inlets*, at the mouth of the Manning River.

Forster Harbour, near Cape Hawke, affording safe anchorage.

Port Stephens, the estuary of the Karuah River. It forms an excellent harbour, and is little inferior in extent to Port Jackson, but on account of its nearness to Newcastle and the scanty population in the immediate district, its trade is trifling.

Port Hunter (Newcastle Harbour), at the mouth of the Hunter River. It is now a safe and roomy harbour, owing to the extensive breakwaters and training walls that have been constructed, and is also the great coal port of Australia. Two miles of magnificent wharves, provided with steam and hydraulic cranes of the most modern type, line its shores. Powerful dredges are constantly at work deepening and clearing the channels, and vessels drawing 23 feet of water can berth alongside the wharves. Its defence is provided for by powerful batteries at Fort Scratchley (near the entrance to the harbour) and at Shepherd's Hill, which overlooks the Pacific.

Broken Bay, the mouth of the Hawkesbury River. It is 15 miles north of Sydney Heads, and was so named by Captain Cook on account of its wild, broken appearance. It is an extensive natural harbour, full of beautiful land-locked bays pushing inland for miles between great rugged precipices, which frown upon the deep, still waters at their base. The bay has three large branches, viz.: *Brisbane Water*, the northern; the *Hawkesbury Mouth*, the central; and *Pittwater*, the southern arm. Brisbane Water consists of a series of bays, and at the head of one of them—the Broadwater—stands the town of Gosford.

Port Jackson, on the southern shores of which stands the city of Sydney. It is one of the finest harbours in the world. Captain Cook, in 1770, gave Port Jackson its name in honour of Sir George Jackson, the then Secretary to the Lords of the Admiralty. Its entrance is marked by two bold headlands, 74 chains apart, called respectively North Head and South Head. Vessels drawing as much as 28 feet can enter the harbour at low tide. There are two channels, an eastern and a western; and steps are being taken to deepen the former to 34 feet at low spring tides. The natural beauties of Sydney Harbour are well known, and "in the quiet waters of its numerous bays and coves the navies of the world might securely rest." Port Jackson possesses about 200 miles of water frontage available for wharfage. The chief offshoots of the harbour are *Sydney Cove*, *Darling*, *Middle*, and *North Harbours*, besides a great number of smaller bays, while the united waters of the *Lane Cove* and *Parramatta Rivers* flow into it on the west. Port Jackson is strongly fortified against hostile attack by powerful batteries at the Heads, and, in addition, Sydney is the headquarters of a division of the Imperial fleet and of the Australian Auxiliary Squadron.

[Geologists tell us that Sydney Harbour and Broken Bay were in times past deep river valleys (like the Grose and Kanimbla Valleys in the Blue Mountains), which at one time stood at an elevation of several thousand feet above sea-level; more recently, however, the whole County of Cumberland sank to its present level, and the waters of the ocean were thus enabled to rush into these old valleys. While sinking for a foundation whereon to rest the piles of the Hawkesbury Railway Bridge, the trunks of some large trees were come upon at a depth of about 200 feet below the present sea-level. During excavation work, also, at Shea's Creek, near Botany, a submerged forest was found at the same depth.]

Botany Bay, a few miles south of Sydney. It was the first Australian port entered by Captain Cook. The great discoverer, referring to this bay, says: "The great quantity of plants which Mr. Banks and Dr. Solander collected in this place

Copyright Photo.

A VIEW IN SYDNEY HARBOUR.

Kerry, Sydney.

induced me to give it the name of 'Botany Bay.'" It has a wide entrance, and is chiefly made use of as a harbour of refuge. The water is shallow, and the shores are barren. These causes, together with its nearness to Port Jackson, prevent the shipping trade of the bay from becoming large. Near its entrance is a line of forts forming the southern defence of the metropolis. Woronora, Cook's, and George's Rivers flow into Botany Bay.

Port Hacking, a large bay a short distance south of Botany, and a harbour of refuge for small vessels. As a fishing ground is held in high favour by residents of Sydney.

Wollongong and *Kiama Harbours*, in the Illawarra District, both small ports that have been "snatched from the sea." They are places of much trade, the former exporting coal chiefly, and the latter dairy produce; but both are difficult of entrance in stormy weather. Fortifications have been erected on the hills at the rear of Wollongong, and a company of artillery is permanently stationed there.

Jervis Bay, a fine expanse of water a little to the south of the Shoalhaven River. Its entrance is two miles wide, and its waters are deep throughout. The trade of the port is small, owing to the fact that the extensive and thickly-timbered lands skirting it on the west and the coal deposits in the adjacent ranges are still undeveloped.

Wreck Bay, a few miles to the south of Jervis Bay.

Bateman's Bay, at the mouth of the Clyde River. It (like the estuaries of the Moruya, Tuross, and Bega Rivers) is a port where steamers load dairy produce for the Sydney market.

Twofold Bay, near the southern boundary of the colony, a splendid harbour that may be entered in all weathers. This sheet of water is divided into two well-marked portions or folds by a mass of land which stretches a considerable distance into the bay. It was formerly the headquarters of an extensive ocean whaling trade, but owing to the reduced demand for sperm oil the industry has been practically abandoned. Only a few men are now engaged in the work, and they confine their exertions to whaling in the bay. The town of Eden is situated on its shores.

Disaster Bay, immediately to the south of Green Cape.

LAGOONS.

At intervals along the coast there are several fairly large sheets of water, partly marine and partly estuarine, and locally called "lakes." They are not lakes in the strict sense of the term, as they all have communication with the ocean by narrow channels. They are for the most part shallow, and their entrances are nearly all obstructed by sand bars. Some, however, are entered by small cutters, especially after heavy rains, when the pent-up waters break through and sweep away the bars. A great many of these sheets of water were doubtless long ago arms of the sea whose entrances were choked up in course of time by accumulations of wind-blown sand. The term "lagoon" has been applied to these expanses of water, the chief of which are :—

Terranora Broadwater, near Point Danger.

Burrawan (or *Lake Innes*), *Lake Swamp* and *Cathie Lake*, lying along the coast, near Tacking Point, and south of Port Macquarie.

Queen's Lake and *Watson Taylor's Lake*, both tidal waters connected with Camden Haven.

Wallis Lake, *Myall Lake*, and *The Broadwater*, a chain of lakes lying between Cape Hawke and Point Stephens. Their surplus waters drain into Port Stephens by the Myall River, and the country surrounding them is richly timbered.

Lake Macquarie, a few miles south of Newcastle, and a favourite tourist resort and picnic ground. It is the seat of a lucrative fishing trade, and several collieries are worked close to its shores. A few small vessels trade to the lake, which is entered by a difficult opening known as Reid's Mistake. It is twenty miles long and from three to six miles broad, and has a coast line of nearly 200 miles. Area, 44 square miles.

Tuggerah Lakes, a favourite fishing and shooting ground, to the north of Broken Bay. The Great Northern Railway passes within two miles of the lakes.

Narrabeen Lake, between Sydney and Broken Bay, another small lagoon much frequented by shooting and fishing parties.

Tom Thumb Lagoon, between Wollongong and Lake Illawarra. It is often so shallow that it may be crossed on foot.

Lake Illawarra, between Wollongong and Kiama, yielding large quantities of fish for the metropolitan market. Near its

shores are extensive smelting works, and steps are being taken to widen the entrance, and convert the lake into a large shipping port. Except in a few places, it does not exceed a few feet in depth.

St. George's Basin, a little to the south of Jervis Bay.

Cunjerong Lake, between Wreck Bay and Ulladulla.

Tuross Lake, at the mouth of the Tuross River.

Lake Wallagoot, four miles south of Tathra.

Wallaya Lake, between the Tuross and Bega Rivers.

Lake Pambula, between Merimbula and Twofold Bay

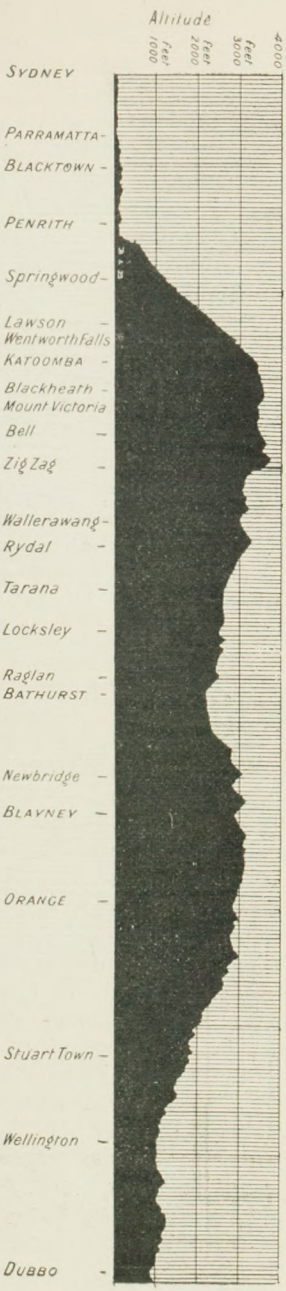
Lake Merimbula, near the township of Merimbula, between the Bega River and Twofold Bay.

SURFACE.

The surface of New South Wales comprises three great natural divisions, viz. : The *Coast District*, the *Tablelands*, and the *Great Plains*.

The Coast District.—The Coast District is a strip of undulating country which lies between the ocean and the eastern flanks of the Tablelands, with an average width of about 35 miles. In the Hunter-Goulburn Valley (its widest portion) it spreads out for a distance of at least 150 miles. Between the Hunter and the Colo-Hawkesbury there is much broken country, especially in the part occupied by the tangled ridges forming the Hunter Range. Near Clifton, at the northern extremity of the Illawarra district, the Southern Tableland abuts on the ocean, from which, however, it gradually recedes as it extends southwards. In Illawarra, therefore, the coastal region is reduced to its narrowest limits. The soil of the Coast District is, as a rule, fertile, especially along the banks of the numerous streams that water it, and flourishing settlements are met with throughout its whole area. Its rivers are nearly all short, because the Great Dividing Range, in which most of them rise lies so close to the ocean They are also rapid, the fall being about 70 feet per mile, and during periods of abnormal rainfall many of them overflow and cause great havoc to crops and settlements. Throughout the Coast District many lateral spurs stretch eastward from the Great Dividing Range towards the Pacific, and form watersheds between the coastal rivers. In addition to these, several low but rugged ridges are scattered at intervals throughout the region.

THE TABLELANDS.—The tablelands, of which there are two—the *Northern* and the *Southern*—comprise an extensive plateau region, extending, with only one great break, along the eastern side of the colony, at an average distance of about 35 miles from the ocean. They form portion of a more extensive series of uplands varying from 30 to 100 miles in width, lying between Cape York and the south-eastern portion of Victoria, and serve as the basement for the Great Dividing Range, which traverses them from north to south. They are furrowed in many parts by deep and rugged valleys, and as a rule they present on the eastern side a steep escarpment towards the ocean; while to the interior plains, from which their line of separation is by no means so clearly defined, their slope is long and comparatively gentle. Both tablelands resemble each other in physical appearance and average height. In addition, they slope towards one another, their highest portions consequently being near the Queensland and Victorian borders respectively. The Liverpool Range and a portion of the Main Range further south serve as a connecting-link between them. Centuries ago these tablelands, in all probability, formed one continuous plateau. Owing, however, to the long-continued action of running water, they



SECTION ALONG WESTERN RAILWAY FROM SYDNEY TO DUBBO

Note: Beyond Dubbo the Great Plains slope about two feet per mile to the Darling, beyond which they rise again at the same rate towards the north-western boundary of the colony.

are now distinct, the Hunter-Goulburn and Peel Valleys having gradually been eaten into the plateau right back to the Great Dividing Range.

The *Northern Tableland* commences in Queensland, and slopes gradually towards the south till it terminates at the northern side of the Peel River Valley. Its average height is about 2500 feet. Its course throughout is parallel to the coast, and along its highest shoulders run the New England Range and part of the Macpherson Range. On the eastern side the North Coast Rivers (Richmond to Manning), fed by a regular and heavy rainfall, have cut deeply into the escarpment and find their way almost straight to the sea between the lower spurs. On the west and south-west, a line from Inverell to Manilla, and thence to Moonbi,* may be taken roughly as the boundary between the Northern Tableland and the Great Plains. The Great Northern Railway from Sydney to the Queensland border runs in a generally northern direction along this tableland at an average distance of about 20 miles from its eastern edge, and passes through the chief centres of population and commerce. The climate is, on the whole, bracing and genial, although the winters are sometimes very severe. Cereals and dairy produce are largely raised, and several gold diggings and tin, silver, and antimony mines are worked throughout the region. Extensive downs, occupied mainly as sheep stations, occur throughout, the chief of which are the *Darling Downs* (in Queensland territory), the *Barney Downs*, the *Beardy Plains*, and the *Byron Plains*.

The *Southern Tableland* is bounded on the north by the Goulburn Valley and the Colo River, the former being the northern limit of the portion west of the Great Dividing Range, and the latter of the part east of it. As the plateau continues southwards it increases in altitude, and at length passes into Victoria. On examining that portion of the tableland on the coast side of the Great Dividing Range, it may be seen that (i) immediately south of the Colo a large section—the Blue Mountains—is almost cut off by Cox's River from the main body lying further south ; (ii) that a line from Rydal to Clifton forms roughly the northern boundary of this southern section ; (iii) the latter remains more or less intact, because the big rivers (Wollondilly and Shoalhaven) which cut through it run from south to north, and so do not interfere with its seaward face ; (iv) from Clifton southwards the eastern edge, while gradually trending inland, is distant only a few miles from the coast (with the Lower

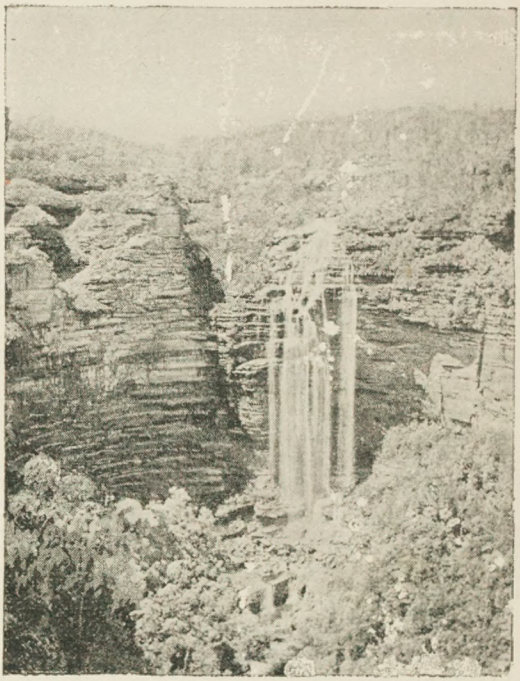
* Between Manilla-Moonbi and Wellington-Gulgong-Mudgee there is no tableland.

Shoalhaven as its only serious interruption) till it reaches a point west of Bega, beyond which it works inland and crosses the Victorian border ; and (v) the Illawarra and Currockbilly Ranges fringe it on the east, the latter, however, rising considerably above its general level, while the former is little more than its seaward edge.

With regard to the portion west of the Great Dividing Range, it may be seen that (i) unlike the corresponding portion of the Northern Tableland, it falls by two well-marked steps instead of one towards the western plains ; (ii) its inner edge may be indicated approximately by a line from Orange to Yass, while the outer runs from Wellington to Gundagai *via* Parkes, Cowra, Young, and Cootamundra ; and (iii) south of the Murrumbidgee it spreads out again as a series of tangled ranges to about the meridian of 147½° east. The average height of the Southern Tableland is somewhat less than that of the Northern, notwithstanding the presence within its limits of the Kosciusko Plateau, the most elevated portion of the colony. Its surface varies considerably, being wild and broken in some parts, while in others it is level and park-like, especially in places remote from the Great Dividing Range. Level upland plains like those of the Northern Tableland occur on this also, the chief of them being the *Bathurst*, *Goulburn*, *Yass*, and *Monaro Plains*, all of which are devoted in the main to sheep-farming and agriculture. A prominent feature of the Southern Tableland is the number of so-called *sunken* valleys which occur within its limits. These, like the cañons of the United States, are vast depressions that have been hollowed out in the course of ages by running water to the depth, in many cases, of more than 2000 feet, the cliffs that bound them being sometimes fully 600 feet in the sheer. Among the more notable of these are the valleys on the Blue Mountains, within easy reach of Sydney ; *Burragorang Valley*, through which the Wollondilly flows ; *Kangaroo Valley*, between Moss Vale and the Shoalhaven ; and the fertile *Araluen Valley*, about 15 miles south-west of Braidwood. Within the Southern Tableland also are situated the far-famed *Jenolan*, *Wombeyan*,* and *Yarrangobilly* limestone caves.

*All these caves are formed in fossil coral reefs or atolls of Silurian age. Writing on the geology of the Wombeyan Caves, Professor David remarks: —

"The belt of limestone in which the caves occur is estimated to be two and a half miles long by one mile wide. . . . [Their] fossils show that the limestone bed is an old coral reef of Palæozoic age. Buried beneath massive accumulations of clay, sand, and quartz-pebble conglomerates, and subjected for vast periods of time to intense heat and pressure, nearly all traces of the original organic structure of the corals and shells have been obliterated, and the old atoll has been converted into a bed of more or less crystalline



WENTWORTH FALLS—BLUE MOUNTAINS.

Towards its southern extremity this tableland becomes wild and broken, and close to the Victorian border occurs the Kosciusko Plateau, often referred to as the "Roof of Australia."

limestone. The whole of these sedimentary strata, with the underlying limestone bed, have subsequently been slowly raised above the sea-level by those oscillations of the earth's coast, which as geology shows, have prevailed throughout all the past of which we have any record, and are even now in progress. Exposed to the denuding influences of air and water, the overlying rocks have been worn down until, at last, at a point far inland, the fossil coral reef, now changed into limestone, is again laid bare. Then commences the process of cave making. The lime dissolved out by the acidulated water [in this case water holding carbonic acid in solution] in the course of the formation of caves is partly deposited in the beautiful and fantastic forms of stalactites and dripstones, but chiefly carried away in solution down the Wombeyan Creek into the Wollondilly River, on to the Nepean and Hawkesbury, and so out to sea at Broken Bay. Arrived in the waters of the Pacific, it is partly absorbed by fish, crustacea, shellfish, and tiny organisms on our own coasts, and partly carried southwards by the East Australian Current, and northwards into water warm enough to support the life of the coral polyp, as at Lord Howe Island. Here it is taken up by the polyp and converted into beautiful coralline structures. Thus history repeats itself, and the coral polyps of to-day construct their strong skeletons out of material which formed the bones of their Silurian ancestors."

Photo by Rev. J. Milne Curran.

THE DARLING NEAR WILCANNIA

(A typical example of the character of the "plain-track" of Western Rivers of N.S.W.)

The climate of the Southern Tableland is mild and bracing, and in summer the numerous health and tourist resorts within its limits are thronged with visitors.

The Great Plains.—The whole of the interior of New South Wales, from the base of the tablelands to its western boundary, is occupied by the Great Plains. These vast tracts, although sloping gently towards the bed of the Darling, are over wide areas, almost as level as a cricket pitch, and for the most part destitute of heavy timber except near the river banks. Trifling elevations and small belts of scrubland occur indeed, but only at distant intervals, and with the exception of the Grey and Barrier Ranges, near the western boundary of the colony, the only elevation deserving of mention is a line of elevated country that extends between Orange and Cobar, and serves as a watershed between some of the tributaries of the Lachlan and the Darling. This ridge is supposed to be the ruined remnant of an old range of mountains, which in ages long since past extended as far as the Grey and Barrier Ranges, but which has been cut through by the Darling River and worn down to its present insignificant height by the action of wind and weather. The drainage system of the Great Plains, as represented on the map, conveys a by no means accurate idea of the actual condition of things. One would imagine on examining an ordinary map that a vast network of mighty streams forming the Darling-Murray system drained the whole region, and carried fertility at all seasons through the length and breadth of these vast level tracts. Such is the case only in specially favourable seasons. In winter, as a rule, and in periods of exceptionally heavy rainfall, this state of things does exist, and it is only at such times that all the tributaries of the Darling reach the parent stream. In the summer months usually, and in periods of drought, the great tributary streams shrink to a succession of mere waterholes, and the Darling itself becomes so reduced in dimensions that its navigation has to be abandoned till the rains set in again. If, on the other hand, the rainfall be excessive, the rivers of the Great Plains overflow and flood the comparatively flat surrounding country for miles. It was during one of these wet seasons that Oxley, on sailing down the Lachlan in 1817, and the Macquarie in 1819, was confronted by what appeared to him to be a vast inland sea. Indeed the Great Plains as they exist to-day are a result of a succession of mighty floods that must have occurred in centuries long since past. Ages ago the waters of an extensive inland sea covered

Copyright Photo

Kerry, Sydney.

ARTESIAN BORE—CULGOA DISTRICT.

the greater part of the region now occupied by the Great Plains and connected the Gulf of Carpentaria with the Southern Ocean.

In several parts of the interior distinctive names have been given to different portions of the plains. The chief of these are the *Liverpool Plains* (an extensive pastoral region lying between the Liverpool and Peel Ranges, and discovered by Allan Cunningham in 1825) and *Riverina* (a fertile, well-grassed region, intersected by a network of streams, and stretching from the banks of the Murray northwards, with no well-defined limit, beyond the Murrumbidgee). In addition to these there are the *Old Man Plain*, between Hay and Deniliquin; *The Bland*, between Cootamundra and Lake Cowal; *Barabool Plain*, on the Lower Namoi; and the *Baronne Plains*, on the Castlereagh River, near Coonamble. The soil of the Great Plains is found as a whole to be admirably adapted for sheep-farming, the great industry of this part of the colony.

In favourable seasons the Great Plains are clothed with rich natural grasses, on which millions of sheep are depastured, and even in dry seasons the salt bush, a shrub, noted as well for its nutritive as for its drought-resisting qualities, is found to be a valuable food for sheep. In addition to this, large quantities of wheat are now grown within the scope of the fertilising influence of the eastern tributaries of the Darling, and the satisfactory results that have attended the working of the Government irrigation farms in connection with some of the artesian wells of the west show that with a sufficient water supply the soil of the plains is well adapted for the growth of fruit and vegetables. From childhood we are accustomed to hear and read of the marvellous fertility of the Nile Valley, whose productiveness is entirely due to the alluvial deposits that have in the course of ages been spread over its surface. For the same reason our interior plains, formed under like conditions, are equally fertile naturally; but Egypt has the good fortune to be visited by regular floods, whereas the plains of western New South Wales are but rarely inundated. Besides, the deepest alluvial deposits of the Nile Valley have not been proved to be more than 50 feet deep, whereas the alluvial soil of the Great Plains of New South Wales has been proved over wide areas to be many hundred feet in depth. One has but to visit the Government irrigation farms carried on in conjunction with the Pera and Native Dog artesian bores in the Bourke district to become aware of the great agricultural

possibilities of the region west of the tablelands, for water alone is wanted to make it in the highest degree productive.

Near the north-western and western frontiers of the colony occur the Grey Range and Barrier Range, the former a gold-mining centre and the latter (which rises with singular abruptness from the surrounding plains) the site of the most extensive and productive silver mines in the world. In addition, the Great Plains can boast of the possession of the very rich copper mines at Cobar and of the White Cliffs opal field in the Wilcannia district, which yields some of the finest noble opal as yet found anywhere. The climate of the plains is hot and parching in summer, although there is an absence of the depressing mugginess that often prevails at that season on the coast, and the winters are enjoyable. The thirsty nature of the soil is shown by the fact that only two per cent. of the rainfall of the Upper Darling is carried by that river below Bourke. Throughout the Great Plains numerous artesian bores have been sunk by the Government and by the squatters, and the yield of water from them is upwards of 60 million gallons daily. The waters of these bores are used both for watering stock and for irrigation. The presence of these wells, and of numerous dams constructed by the Government along the most important stock routes, enables cattle and sheep to be driven and wool and other station products to be carried, even in the driest season, with comparative ease and safety to the railway centres for despatch to the ports on the seaboard.

MOUNTAINS.

The Great Dividing Range.—A well-defined range of mountains stretches along the whole eastern portion of Australia from Cape York to Wilson's Promontory. The portion of this chain lying within New South Wales is known as the Great Dividing Range. Proceeding from north to south it has, for convenience, been subdivided into the following eight portions† :—

1. That Portion of the Macpherson Range* between *Wilson's Peak*, on the Queensland border, and *Bald Rock*, a prominent elevation 15 miles north of Tenterfield.

2. The New England Range, extending from *Bald Rock* as far as the parallel of Port Macquarie. This range has an average

† These divisions are purely artificial, as there are no gaps indicating where one range ends and the next begins.

* This nomenclature is taken from the standard map of the colony, compiled by the Survey Department.

elevation of about 3500 feet, and its highest peak is *Ben Lomond*, 5000 feet in altitude. The Great Northern Railway winds across the rugged shoulders of this portion of the cordillera, and passes within about 500 feet of the top of Ben Lomond.

3. The Liverpool Range, commencing at the termination of the New England Range, follows a westerly course for about 150 miles, and terminates about 20 miles north-east of Cassilis. It serves as a boundary between the Liverpool Plains and the Hunter-Goulburn Valley, and as part of the connecting-link between the two tablelands. It is rugged throughout, and its numerous peaks, viewed from a distance, present the Sierra-like appearance of the mountains of Spain. Its highest summit is *Oxley's Peak*, about 4500 feet in elevation, named after John Oxley, one of our earliest inland explorers. The more prominent of the remaining peaks are *Mount Temi* and *Mount Tinagroa*. From the latter, which is eight miles S.W. of Murrurundi, a spur branches off in an E.S.E. direction to the Black Mountain (3297 feet), eight miles N.E. of Scone. In this offshoot are *Mount Wingen*, a well-known burning mountain, and *Mount Murrulla*, a prominent landmark three miles from Murrurundi. Within the limits of the Liverpool Range several elevated passes are met with, the chief of which are *Pandora's Pass* (first named and explored by Allan Cunningham) and the well-known *Gap of Murrurundi*. Through the granite face of the Liverpool Range, a few miles beyond Murrurundi, and at an elevation of 1500 feet above sea-level, the expensive Doughboy Hollow tunnel, through which the Great Northern Railway runs, has been cut.

[Mount Wingen.—In a spur of the Liverpool Range, about ten miles from Scone and two miles from the Wingen railway station, there stands, at the height of 1000 feet above sea-level, one of the natural curiosities of Australia. This is Mount Wingen, a burning mountain, and the solitary example of its kind on the continent. Its fires are not volcanic, but result from the gradual but continual burning of a thick bed of coal—the Greta seam—some distance underground. A thin wreath of smoke and bluish vapour may be seen overhanging the spot and issuing from an area 100 yards wide and extending a distance of about three miles between the "Big" and "Little" Burning Mountains at Wingen. The "Big" Burning Mountain occupies an area of about half an acre, and presents the appearance of a gigantic lime-kiln. Here the subterranean fires rage fiercely, and the surface-rocks are everywhere broken and bleached, and in places almost red-hot. From the clefts in this burning area there issue large quantities of smoke and the vapours of several sulphur compounds, which, when they condense, deposit a beautiful lemon-yellow coating over the surrounding rock-surfaces. The same appearances are found at the "Little" Burning Mountain, but are developed on a much less extensive scale. It has been estimated that the burning

at Mount Wingen has been going on for at least 800 years, and in all probability it originated in bush fires. The sulphur compounds deposited at the mountain were at one time collected and sold as a remedy for cuts and galls, but this branch of colonial industry has long since been abandoned. Mount Wingen attracts great numbers of tourists annually, and it is one of the most prominent places of interest presented to the view of passengers by the Great Northern Railway Line as the train slowly climbs the hillslopes above Scone.]

4. The Main Range*.—From the western extremity of the Liverpool Range this portion of the Great Dividing Range sweeps in an almost semicircular fashion around the upper basin of the Hunter-Goulburn as far as *Mount Corricudgy*, the point of departure of the Hunter Range. Thence it trends westerly to within a short distance of Ilford, on the Wallerawang-Mudgee line, and then running southerly, passing in turn close to Capertee and Rydal, terminates at length near Lake Burra Burra, six miles north-west of Taralga. Its average height is inconsiderable compared with that of its principal offshoots. It attains its greatest altitude in *Mount Binda* (4460 feet), a prominent peak between Rydal and the Jenolan Caves. In addition to this, the chief elevations are *Tayan Pic* (4000 feet) 12 miles south-west of Corricudgy, and *Shooter's Hill*, close to which the Macquarie Range branches off to the west. The Great Western Railway crosses the range at Rydal, and the branch line to Mudgee passes over and along it further north.

5. The Cullarin Range, extending from Lake Burra Burra to the southern extremity of Lake George, whose waters occupy portion of a depression in the chain called the Lake George Basin. The average elevation of this range is about 2500 feet, and its highest peak is *Mount McAlister*, 3390 feet high, distant six miles south-west of Taralga. Other prominent peaks are—*Mount Fitton* (3107 feet), *Mount Strathaird* (3012 feet), and *Mount Cullarin* (3000 feet). This range rises in places into rugged, precipitous cliffs, but consists for the most part of gently-sloping uplands, clothed with forests of stunted gum trees. It is crossed by the Great Southern Railway about 20 miles from Goulburn. Two important rivers of New South Wales—the Hawkesbury and the Lachlan—have their origin in the Cullarin Range.

6. The Gourock (or Sand Hills) Range, a very rugged mountain chain extending from Lake George southwards to about the head of the Kybeyan River, in latitude 36½° S. For some

* The name *Blue Mountain Range* given on some maps to this portion of the Great Dividing Range is not used locally, neither is it recognised by the Survey Department.

distance south of the Araluen Valley it forms the edge of the Southern Tableland. Its highest peak is *Tumanmang*, 4656 feet in altitude. The chief remaining elevations in the range are *Jindulian* (4300 feet) and *Talerang Pic* (4134 feet).

7. The Monaro Range, stretching from the Gourock Range first southward for a short distance and then suddenly turning to the west and north-west to the vicinity of Kiandra. This range encloses on the south the rich and beautiful pastoral and agricultural region called the Monaro Plains. Its highest peak is the *Head of Kybeyan River*, 4010 feet in altitude. *Hudson's Peak*, *The Twins*, *and the Queen Gallery* are the more prominent remaining elevations.

8. The Muniong Range, extending from the Monaro Range into Victoria, where it is continued under the name of the Australian Alps. The most southern portion of the Muniong Range in New South Wales is now frequently referred to as the Snowy Mountains. The Muniong Range is the highest portion of the Great Dividing Range, its average elevation being about 6000 feet. The highest peak of the range is *Mount Kosciusko*, 7328 feet, the highest mountain in Australia. It is almost wholly composed of gneissic granite, although belts of slate and patches of basalt are met with on its slopes. *Mount Townsend* (also called Mueller's Peak), another peak belonging to the Kosciusko group, attains an elevation of 7260 feet, while *Ram's Head* and *The Pilot* are respectively 6600 and 6020 feet in altitude. *Mount Twynan* (about 7200 feet), *David Peak*, and *Etheridge Peak* are also prominent elevations in the Snowy Mountains. For six months of the year snow may be seen on the high peaks of the Muniong Range, and although Kosciusko falls short of the snow line by about 700 feet, yet snowdrifts are often to be met with, and tourist parties have been shut in for days near its summit, even in the middle of summer. There are no glaciers however, nor, as far as is known, are there any traces of past glacial action on the slopes of this or any of the other peaks of this great upland region.

The name Kosciusko was given to this peak by Count Strzelecki (who ascended its lower slopes and explored the surrounding country in 1840) in consequence of the resemblance it bore to a tumulus erected at Cracow over the remains of the Polish patriot Kosciusko. This hoary weather-beaten crag is probably one of the oldest land surfaces in the world, and, grand as it is to-day, in times long since past it must have been incom-

Photo by Rev. J. Milne Curran.

LAKE ALBINO—WITH MT. KOSCIUSKO IN THE BACKGROUND.

(Shewing Region above the Tree Zone.)

parably grander, for it is now in truth but "the abraded stump of a much higher mountain, and not improbably a volcanic mountain too."* It was standing high and dry in the full strength of mountainhood when in recent geological time a deep sea extended through Central Australia, and washed against the present foothills of Eastern Australia, when Tasmania was still joined to the mainland, and when thousands of feet of deep blue waters covered the rugged shoulders of the Alps and Himalayas. Tourist trips to Kosciusko and the Snowy Mountains have since the opening of the railway to Cooma become quite common. The road lies from Cooma to the township of Jindabyne, and thence to the top of the mountain, and throughout the whole journey of 60 miles from the railway terminus there is no Alpine climbing to be done—indeed a person may ride to the top of Kosciusko. When this point is reached the outlook is one of almost unexampled magnificence. As a visitor to this region has remarked: "Nothing in the colony exceeds the panoramic grandeur of the view that awaits the traveller's ascent. To say that it repays him for his trouble is but a poor compliment to the scenery. Looking northward, he peers down into the valley of the Snowy River; southward, the panorama extends beyond the boundary of the colony, far into the Gippsland district of Victoria. Away to the east stretch the Monaro Plains, with the coastal ranges in the distance, and, best of all, to the west, cradled between high mountain ranges, slumbers the peaceful valley of the Murray." The Kosciusko Plateau has on the whole a comparatively gentle slope towards the east, while on its western side the descent into the Murray Valley is wildly rugged and precipitous. On the slopes close to the summit of Kosciusko there are several lakelets, "weird beyond description," the chief of which are *Cootapatamba Lake*† (*i.e.*, the lake where the eagles drink), *Blue Lake* (also called *Lake Merewether*), *Lake Garrard*, *Lake Albino*, and the *Hedley Tarn*. In their icy cold waters lives a species of trout met with nowhere else in Australia, but abounding in the mountain streams of Tasmania and parts of South America. No trees are met with on the slopes of Kosciusko after leaving the 6500 feet level; many beautiful and hardy flowerets are found near the summit, and bird life is represented by a few wild ducks, larks, and eagles. A peculiar interest attaches to this peak from the fact that a high-level

* See Rev. J. Milne Curran's excellent description of "The Roof of Australia," in *The Sydney Daily Telegraph*, 25th December, 1897.

† It has been suggested with much propriety that all these "lakes" should be called *tarns*.

meteorological station has been recently established on it summit by the Government Meteorologist of Queensland.

Lateral Spurs from the Great Dividing Range.

Many lateral spurs branch off both to the east and to the west from the Great Dividing Range. Of those that belong to the Coast District the principal are given in the following list :—

1. The Macpherson Range commences at Bald Rock (15 miles from Tenterfield and 10 miles from Jennings) at the northern extremity of the New England Range. It first runs northerly to the vicinity of Maryland and afterwards north-easterly to Mount Wilson. Thence its course is easterly to its termination near Point Danger. This range, from Bald Rock to Mount Wilson, forms a portion of the Great Dividing Range, and from Mount Wilson to Point Danger serves as a portion of the northern boundary of the colony. It serves also as a watershed between the basin of the Logan River in Queensland and those of the Tweed and Richmond in New South Wales. Its highest peak, *Mount Lindsay*, aptly described as "the grand warder of our northern frontier," rears its castellated summit 4064 feet above sea-level; but besides this there are several other high and rugged peaks along the crown of the ridge. A coach road from Murwillumbah into Queensland crosses the eastern portion of the range. The Macpherson Range intercepts the vapour-laden north-easterly winds that blow in this part of the colony, and as a consequence the Richmond River Valley enjoys a rainfall much in excess of any other district in New South Wales. Within a short distance of Mount Lindsay the Clarence, Richmond, and Logan Rivers have their origin. The range is rugged throughout, and has an average elevation of about 3000 feet.

2. The Richmond Range, branching off from the Macpherson Range near *Mount Lindsay*, runs first southerly to *Mount Marsh*, and thence easterly to the ocean. It separates the basin of the Richmond from that of the Clarence.

3. The Macleay Range quits the New England Range a few miles north of the township of Guyra. It runs in an almost easterly direction towards the coast for a distance of about 80 miles, and forms a watershed between the basin of the Clarence and the Macleay Rivers. Its principal elevation is *Chandler's Peak*, about 5130 feet high.

4. The Hastings Range leaves the New England Range near its southern extremity and runs easterly to within a few miles of Crescent Head. It forms a watershed between the Macleay and Hastings River basins, the latter having its origin in the range. The most noticeable peaks in the Hastings Range are *Mount Kippara* and *Bunda Bunda*. About eight miles south of the range, but quite apart from it, stands *Mount Sea View*, a prominent peak, 3100 feet in elevation, and distant 40 miles west from Port Macquarie.

5. The Mount Royal Range stretches in a general south-easterly direction from the Liverpool Range, from which it branches off at *Ben Hall's Gap*. It is very rugged in character, and towards its southern extremity sends off numerous spurs, which penetrate the valleys of the Hunter and Manning. Its culminating point is *Mount Royal* (or *Cobrabald*, 3000 feet), situated near its south-western extremity. Close to *Paddy's Ridge*, a prominent elevation in this range, the Hunter and the Manning Rivers have their source.

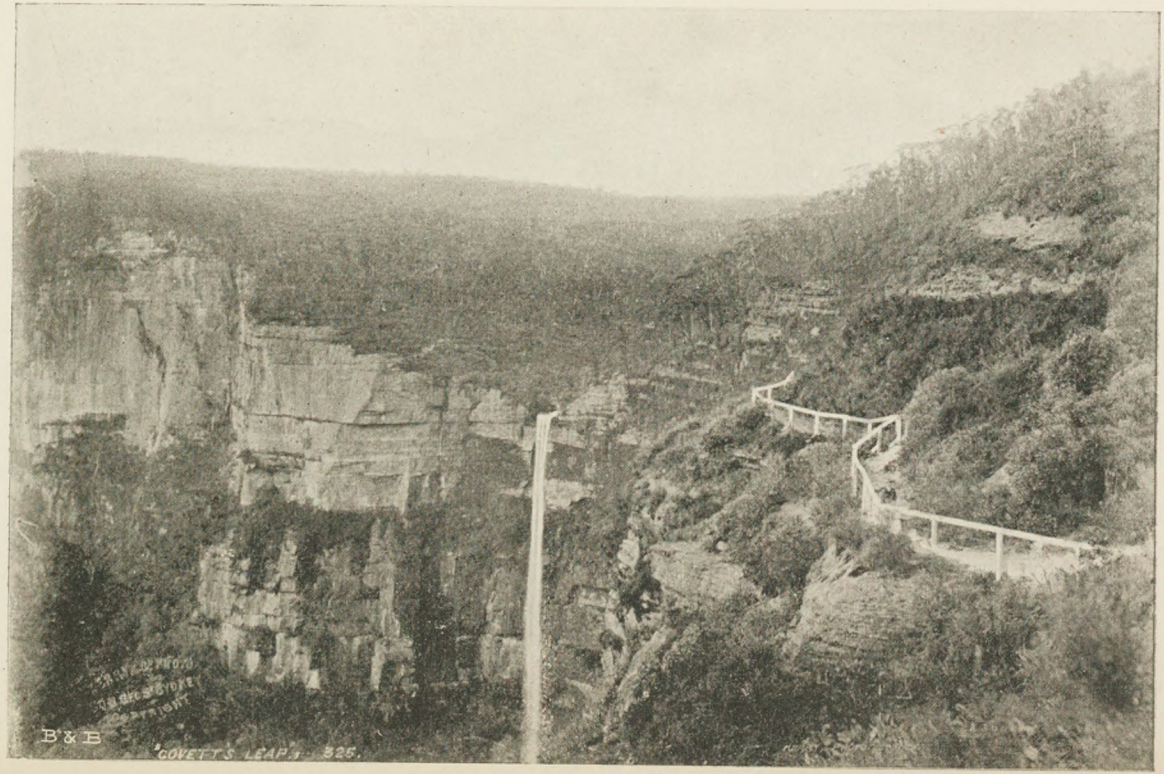
6. The Hunter Range, a spur of the Main Range, commences at *Corricudgy* (3000 feet) and stretching first N.E. and afterwards S.E. towards the coast, forms a portion of the southern boundary of the Hunter River Valley. Towards its eastern extremity it becomes greatly broken, and its numerous branch ridges penetrate far into the Hunter and Hawkesbury River basins. The great northern road between Sydney and the Hunter River winds through the eastern portion of this range. In addition to *Corricudgy*, which is common to the Great Dividing Range and the Hunter Range, the only noteworthy peaks are *Mount Poppong* and *Mount Murwin*.

7. The Blue Mountains.—The region usually known by the name of the Blue Mountains consists of a rugged plateau in the County of Cook. It extends eastward from the Main Range, and is bounded on the north by the Colo River and on the south and south-west by Cox's River, while the Nepean-Hawkesbury flanks it on the east. Its backbone consists of a spur which leaves the Main Range about 10 miles south-east of Capertee, and running first southerly to Mount Victoria, and then easterly, terminates near Penrith. From this leading range there branches off to the east near Bell a spur which abuts on the Kurrajong Mountains close to Richmond. Between these two spurs is the Grose Valley, at the head of which is a neck of land called the *Darling Causeway* (the narrowest part of the main ridge already mentioned) three miles long, which serves as a line of separation between the Grose and

Kanimbla Valleys. From the central axis of the Blue Mountains many lateral spurs branch off and give the whole region a broken and irregular appearance. The chief peaks are *Mount Clarence* (4000 feet), *Mount Victoria* (about 3500 feet), *Mount Hay* (3270 feet), *Mount Tomah* (3276 feet), *Mount Wilson*, and *Mount King George* (3470 feet), the last three of which lie in the ridge on the north side of the Grose Valley. When viewed from a distance a purple blue haze appears to hang over these mountains, and from this circumstance they received their name. Their soil is for the most part barren, and quite unfit for cultivation, except in a few isolated places such as Mounts Wilson, Tomah, King George, and Hay, on all of which the vegetation is luxuriant owing to the presence of caps of decomposing basalt. This region, however, is noted for the richness of its coal seams and beds of ironstone and kerosene shale. The Blue Mountains are furrowed by numerous deep gorges, such as the *Grose*, *Kanimbla*, *Jamieson*, and *Capertee Valleys*, carved out of the solid sandstone by water action.† The views afforded by these wildly picturesque and apparently inaccessible natural depressions are extremely magnificent. The cliffs forming their sides are composed of horizontal strata of iron-stained sandstone, and "are so absolutely vertical that in many places a person standing on the edge and throwing down a stone can see it strike the trees in the abyss below. . . If we imagine a winding harbour, with its deep water surrounded by bold cliff-like shores, to be laid dry, and a forest" of graceful tree ferns, sassafras, and giant eucalypti "to spring up on its sandy bottom, we should then have the appearance and structure" they severally exhibit.* Into these vast chasms tumble several mountain torrents, many of which become lost in gauzy mist before reaching the bottom, while around nearly all of them the scenery is wild and romantic. The principal of these well-known cascades are those of *Govett's Leap*, *Katoomba*, *Leura*, and *Wentworth Falls*, all close to the Great Western Railway, and within easy reach of the metropolis. The Blue Mountains were first crossed by Messrs. Blaxland, Lawson, and Wentworth in 1813, and now one of the main railway lines of the colony runs along their main ridge, from which it descends again near Lithgow by means of a zigzag, said to be one of the greatest engineering curiosities in the world. Not only do the Blue Mountains possess the charm of beautiful scenery, but their clear and invigorating atmosphere attracts residents of the coast in great numbers during the summer months.

8 The Mittagong Range is a disconnected chain which runs

† See *Appendix B.* * See Darwin's *Journal of Researches.*



GOVETT'S LEAP—BLUE MOUNTAINS.

Kerry, Sydney.

transversely along a portion of the Southern Tableland. It commences on the eastern side of the Wollondilly, runs easterly past Mittagong, and connects at length with the Illawarra Range a short distance north of the township of Robertson. It is pierced by a tunnel belonging to the Great Southern Railway at "The Gib" (a contraction of Gibraltar), a hill of igneous rock, 2830 feet in elevation, near Mittagong.

[From the western side of the Wollondilly, and nearly opposite the western extremity of this range, a line of low, disconnected ridges runs north-westerly to *The Big Hill*, a peak in the Main Range near the source of the Abercrombie River. A well-defined spur also, that does not bear any particular name, branches off from the Main Range at *The Big Hill*, runs N.E. to Cox's River, attains its highest elevation in *Mount Shivering* (3678 feet), and forms part of the southern boundary of the Kanimbla Valley.]

Western Spurs of the Great Dividing Range.

Proceeding from north to south the chief of these are :—

1. The Nandewar Range.—This spur branches off from the New England Range, near the village of Kentucky, about 12 miles south of Uralla. Its direction is first north-westerly, as far as Mount Drummond (24 miles N.E. of Narrabri) thence northerly till it terminates about 10 miles from the banks of the Gwydir. It forms a portion of the watershed between the basin of the Gwydir and that of the Namoi. The solidified outpourings of several long-extinct volcanoes are met with in this range. Its highest peak is *Mount Lindsay*, about 3000 feet in elevation.

2. The Moonbi Range.—This range, which is crossed by the Great Northern Railway, branches off from the New England Range near the source of the Macdonald River, and throughout its whole course it is very rugged and broken. It runs in a northerly and north-westerly direction, separating the upper course of the Peel River from that of the Maluerindi, and terminates on the latter about 22 miles N.E. of Manilla. Its highest peak is known as *The Summit* (3600 feet), and *Mount Gulligall* is a prominent elevation in the range.

3. The Peel Range.—This branch leaves the Liverpool Range at a point nearly opposite the Mount Royal Range, and runs in a north-westerly direction to a point near the Peel River about midway between Tamworth and Gunnedah. It separates

the basin of the Peel from that of a smaller tributary stream, the Conadilly, and attains its highest elevation in *Mount Turi*, nearly 3000 feet. It is crossed by the Great Northern Railway.

4. The Warrumbungle Range.—This, which may be considered as a north-westerly prolongation of the Liverpool Range, terminates in the vicinity of Coonabarabran. The range is very rugged, and evidences of past volcanic activity are met with throughout its course. The Castlereagh, an important branch of the Darling, rises in the range. Its highest peak is *Mount Exmouth* (3000 feet).

5. The Macquarie Range.—This offshoot leaves the Main Range near Shooter's Hill, stretches first north-westerly and afterwards northerly, separating the upper tributaries of the Macquarie from those of the Lachlan, and terminates not far from the junction of the Cudgegong and Macquarie Rivers. It attains its highest elevation in *Mount Canobolas*, a group of volcanic peaks 4610 feet in elevation, rich in copper, and plainly visible from the towns of Orange, Blayney, and Carcoar. *Mount Lachlan* (or *Mount Macquarie*) another prominent peak, is close to Carcoar, and attains an elevation of 3943 feet. In the Macquarie Range rise the Lewis Ponds and Summer Hill Creeks, where the first payable goldfield discovered in Australia was worked in 1851. Its slopes are mainly devoted to sheep grazing and the growth of cereals. The Macquarie Range is crossed by the Great Western Railway near Newbridge and Millthorpe. From the vicinity of Mount Canobolas an offshoot of the Macquarie Range runs north-west past Molong, and afterwards west under the name of the *Curumbenya Range* out on to the plains north of Parkes. From this range in turn another branch runs north towards Dubbo, first under the name of *Harvey's Range*, and afterwards of the *Sappa Bulga Range*.

6. The Mundoonan Range.—This spur branches off from the Cullarin Range a little to the north of Lake George, and runs westerly to the vicinity of Cootamundra. Around this town a spur curves southward to Gundagai. It is crossed near Young by the Blayney-Harden railway line, which forms a connecting-link between the Great Southern and Great Western trunk lines. It separates the upper basins of the Lachlan and Murrumbidgee, and reaches its highest elevation in *Mundoonan* (3000 feet).

7. The Murrumbidgee Range.—This is a northerly offshoot from the Muniong Range. It is extremely rugged, and several of its peaks approach 7000 feet in elevation. It separates the

upper basin of the Murrumbidgee from that of its tributary, the Goodradigbee, and, as far as is known, attains its highest elevation in *Murragural*, 6987 feet in altitude.

8. The Tumut Range.—This also is a spur from the Muniong Range. It runs in a northerly direction, separating the upper courses of the Goodradigbee and Tumut Rivers, and terminates near the Murrumbidgee, above Gundagai. The range is wild and rugged, and its slopes and foothills are in many places auriferous.

9. The Murray Range.—This is the most southern of the lateral branches of the Muniong Range It leaves the main range near Mount Kosciusko, and runs north and west, separating the upper courses of the Tumut and Murray Rivers. Its highest peak is *Mount Dargal*, 5490 feet in elevation.

The Coast Ranges.

Four well-defined ranges lie in the Coast District at varying distances from the sea. They preserve a direction generally parallel with the tablelands, of which in places some of them form the eastern edge. Proceeding from north to south these ranges are :—

1. The North Coast Range.—This range lies at an average distance of about 35 miles from the coast, and runs from north to south, from Mount Marsh, in the Richmond Range, to the Hastings River District. In the first part of its course, between Mount Marsh and the Clarence River, it is called *Coal Ridge*. South of the Clarence it is by no means a continuous chain, and it is pierced further south by the Macleay River. The average height of the range is about 2000 feet. South of the Clarence a branch spur runs easterly to Coff's Harbour, and forms the northern boundary of the County of Raleigh.

2. The Illawarra Range.—This range is so named because it forms the most conspicuous feature of the Illawarra District, of which it is the western boundary. It rises abruptly from the sea to the height of 1000 feet at Clifton (or Coal Cliff), a little to the north of Bulli. It recedes inland as it stretches southward, but on the whole its average distance from the sea is little more than five miles. As it approaches the northern bank of the Shoalhaven River it becomes known locally as the Cambewarra Range. The Illawarra Range is capped by rugged sandstone masses, and is traversed throughout by valuable coal

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AN ILLAWARRA SCENE (STANWELL PARK).

seams, which crop out upon its seaward face. These seams are worked at Clifton, Bulli, Corrimal, Mt. Keira, and Mt. Kembla, inclines and short railways connecting the collieries with the ports and jetties at Bulli, Bellambi, Wollongong, and Port Kembla. At Clifton the tunnel opens out on the sea cliff. The Illawarra Range forms a portion of the eastern fringe of the Southern Tableland, and, although it is somewhat higher than that portion of the plateau immediately west of it, its altitude throughout is much below that of the whole tableland. Its most conspicuous elevations are *Broker's Nose*, *Mount Keira*, and *Mount Kembla* (2000 feet), the last two of which stand out in front of the range, with which they are joined by narrow necks of sandstone. This range throughout its whole course presents an almost perpendicular face to the Pacific, and, notwithstanding the steepness of its eastern descent, it is crossed by three good roads—one over Bulli Pass, near its northern extremity, another from Mittagong over the Macquarie Pass, while the third leads from Moss Vale into the Illawarra District near Jamberoo. The outlook from the top of the Bulli Pass is one of the finest in the colony. Busy townships lie at the foot of the range, Lake Illawarra looms in the distance, the graceful group of the Five Islands is seen nestling close to the seashore south of Wollongong, while before the wondering eyes of the spectator "is spread the Pacific Ocean in all its expansive grandeur"

3. The Currockbilly (or Budawang) Range.—This extremely rugged range commences on the south bank of the Shoalhaven River, about six miles S.E. of Marulan. It runs first S.E. for about 25 miles, till it unites with a spur called the *Turpentine Range*, stretching S.W. from the vicinity of Nowra From its junction with this ridge the Currockbilly Range stretches to the south and terminates on the north bank of the Moruya, about eight miles from the ocean. For a considerable distance it runs parallel to the Gourock Range, and forms the eastern boundary of the Upper Shoalhaven Valley. During almost its whole course it forms the eastern edge of portion of the Southern Tableland, above the general level of which, however—unlike the Illawarra Range—it rises to a considerable height. Its chief elevations are *Budawang* (3630 feet), *Currockbilly* (3619 feet), and *Pigeon House* (2398 feet). The last, which forms from the sea a conspicuous landmark, was so named by Captain Cook on account of its resemblance to a dove-cot.

4. The South Coast Range.—This is a spur from the Monaro Range, and forms the eastern and southern boundaries

of the Upper Snowy River basin. It leaves the Monaro Range east of Nimitybelle, and runs in a southerly direction towards the Victorian border, on approaching which it bends to the westward, and terminates on the left bank of the Snowy River. The highest peak of this chain is *Delegate Hill*, in Victoria (4000 feet), the highest in the New South Wales portion being *Coolangubra* (3712 feet in elevation).

[In addition to the above, a low range sweeps in the form of a semicircle from near Mount Dromedary to Bega, and attains its greatest elevation in *Mumbulla*, 2630 feet high.]

Ranges of the Interior.

Near the extreme west and north-west of the colony, verging on South Australia and Queensland respectively, stand out two fairly well defined ranges of no great extent or elevation, the *Barrier Range* and the *Grey Range*, forming the western edge of an extensive "depression, through which the largest rivers of the Australian continent hold their devious course." Rich and extensive lodes of silver and lead ores exist and are worked in the Barrier Range, at Broken Hill, Silverton, and Thackaringa, and the Mount Browne goldfields are situated along the slopes of the Grey Range. The highest elevations in the Barrier Range are *Mount Lyell* (2000 feet), and *Mount Arrowsmith* (2000 feet). *Mount Browne*, *Mount Sturt*, and *Mount Poole* are the most prominent peaks in the Grey Range.

Running in a north-westerly direction between Parkes and Cobar, and forming a watershed between the Lachlan and Upper Darling basins, a number of disconnected ridges are met with, but they only rise a few hundred feet above the level of the surrounding plains. They consist in the main of a line of primary rocks, and form the basis of a much higher range that probably existed many ages ago in this part of the colony.

Isolated Mountains.

At intervals in the district east of the Great Dividing Range several mountain peaks, altogether apart from any continuous chain, stand out as prominent landmarks. Proceeding from north to south the chief of these are:—

Mount Warning (3840 feet in elevation according to the

Admiralty chart), about eight miles away from the Macpherson Range, and not far from the head of the Tweed River. This prominent elevation is a well-known landmark for coasting vessels, and is visible in fine weather 60 miles away. It was named by Captain Cook, because after passing it he was carried by a current into dangerous proximity to the treacherous rocky shoals off Point Danger.

Mount Doubleduke, situated a little to the north of Shoal Bay. It is remarkable at a considerable distance out at sea. Height, 836 feet.

Mount Wohiman (also called *Clarence Peak*), to the south of Shoal Bay, on the road from Yamba to Grafton. This is the peaked hill observed by Captain Cook. Height, 1200 feet.

Elaine, lying at the head of the Glen Ugie Creek, about 12 miles south-east from Grafton.

Yarrahappini, near the coast, about four miles north of Trial Bay.

Mount Sea View (or *Kokomerican*), about eight miles due south from the Hastings Range. It stands about 40 miles inland from the sea, and was so named by Oxley in 1819, because from its summit he obtained a magnificent view of the ocean. Its height, according to the latest measurements by the officers of the Survey Department, is 3100 feet.

The Brothers (viz., the *North*, the *South*, and the *Middle* Brother), three lofty and conspicuous peaks situated near Camden Haven in a north-easterly direction from Taree. These mountains were seen and named by Captain Cook. Height, 1700, 1650, and 1910 feet respectively.

Talawah, south-west of Taree and north of Cape Hawke.

Jellore, about seven miles north-east of Mittagong, and close to the source of the Nattai River. It is conical in shape, and is often plainly visible from Sydney, 70 miles distant. Height, 2372 feet.

Coolangatta, in the well-known Berry Estate, near the mouth of the Shoalhaven River. Height, 1000 feet.

Dromedary, a prominent landmark south of the Tuross River

about four miles inland. It was so named by Captain Cook from its resemblance to a dromedary's back. Height, 2706 feet.

Imlay, 2910 feet high, about nine miles south-west of Two-fold Bay.

Extinct Volcanoes.*

At the present time there are no active volcanoes in New South Wales, nor indeed on the Australian continent, Mount Wingen, in a spur of the Liverpool Range, being only a burning mountain whose fires result from the combustion of a coal seam. In past ages, however, Australia was the scene of violent volcanic activity. Eruptions occurred at intervals in all geological periods from Silurian to Tertiary and Post-Tertiary, the lava flows of Tertiary age, however, being apparently the most extensive. The well-known Kiama basalt, or blue metal, so largely used for macadamising streets and for ballasting railway lines, is in truth only a solidified lava, and was ejected during the Permo-Carboniferous period—that to which the coal seams of Newcastle, Lithgow, and Illawarra belong. At Kiama the basalt may be seen overlain in places by rocks belonging to that age. In the seaward face of *Nobby's*, at Newcastle, a basaltic dyke may be seen intruding upwards through the Coal Measures which form the headland. As a result of this intrusion the coal seams in the cliff have been baked into coke for about 10 feet on each side of the dyke. At several places not far from Sydney (*e.g.*, at Bondi, Pyrmont, Belmore, Burwood, Homebush, Pennant Hills) occur extensive volcanic dykes that have been thrust up through the shales and sandstone. Similar intrusions may be observed in some of the railway cuttings near Tenterfield, where the basalt has been forced up through granite. At *The Valley*, at a place called *Siberia* (not far from the Glenbrook Railway Station), and at *Euroka Farm* (on the Nepean, 10 miles south of Penrith)– all near the eastern edge of the Blue Mountains—are three vents representing a line of weakness along which volcanic activity exerted itself probably in Tertiary times. Near the great reservoir at Prospect an intrusion of dolerite and basalt half a mile wide forms a conspicuous hill over 400 feet high, which is supposed to be the site of an old volcanic pipe. Flat-topped basaltic hills (as a rule of Tertiary and Post-Tertiary age) occur in many places in the colony, and great sheets of basalt, every one of which poured as a river of molten rock from the fiery crater of some long-extinct volcano, are found at interva's along the flanks of the Great Dividing Range. In times long since past, when Australia was divided into two great islands by a sea extending through the centre of the continent, from the Gulf of Carpentaria to probably the Great Australian Bight, a long line of volcanoes extended from Mt. Canobolas, near Orange, northwards through the Warrumbungle and Nandewar Ranges and onward as far as the Glass House Mountain, beyond Brisbane. The recent discovery of basalt in places on the slopes of Mt. Kosciusko goes to show that in all probability the "Roof of Australia" was in times past lighted by volcanic fires.

* Vide *Geology* (pp. 70-76) and *Appendix A*.

RIVERS.

The great watershed for the rainfall of New South Wales is supplied by the Great Dividing Range, which, as far as drainage is concerned, divides the colony into an Eastern and a Western Slope.* As the mountains in no instance rise to the limit of perpetual snow, the rivers have to depend for their water supply upon the rainfall, with the exception that in spring and autumn the melting of the snow, which lies on the higher slopes of the Kosciusko Plateau for many months of the year, helps to swell the volume of the Murray and many of its tributaries. The volume of the rivers thus varies with the season, and while in summer they are, as a rule, considerably contracted, they are usually swollen in winter. These conditions are the reverse of those prevailing in the other continents, where the melting of the snow in summer causes the rivers in that season to have a much greater volume than at other periods of the year.

The rivers that belong to the Eastern Slope are generally short on account of the proximity of the Dividing Range to the ocean. The Hawkesbury and the Hunter are prominent exceptions, their greater length being due to their exceedingly winding courses. The fall of the eastern rivers is also great (about 70 feet per mile), and, as a consequence, in periods of exceptionally heavy and sudden rainfall they frequently boil over their banks, and flood the low-lying portions of their valleys, causing great destruction to property and even to life. Although these floods cause sad havoc during their continuance, yet they possess withal a high economic value by reason of the rich top dressing of silt which they deposit over the low-lying surrounding districts. As examples we may instance the alluvial lands skirting the Clarence, Hunter, and Shoalhaven, which are noted for their depth and fertility. Among the many disastrous floods that have occurred in the Coast District may be mentioned that of the Hunter River in 1893, when the whole of the low-lying district from Newcastle to far beyond West Maitland was deluged, and hundreds of settlers were rendered homeless. Nearly all the coastal rivers have bars at their mouths. These sand accumulations greatly hamper river navigation, and are caused by the combined action of tides and of the outflowing river currents, which, on reaching the sea, have their capacity for transporting suspended

* In addition to these two main slopes there are two others, viz., a SOUTHERN SLOPE, drained by the Snowy River and its tributaries, and an INLAND SLOPE, comprising the Lake George Basin in the Cullarin Range.

material enormously reduced. The presence of these obstructions has necessitated the carrying-on of much dredging work and the construction of several expensive training walls and breakwaters to minimise the evil, but as yet no completely satisfactory results have been obtained. Floods always clear away these sand accumulations and open the channels, which, however, soon become silted up again.

The rivers of the Western Slope belong to one great system —that of the Murray-Darling—while those of the Eastern Slope are all disconnected streams, and have a more uniform volume than those belonging to the Western Slope. The eastern cordillera is sufficiently lofty to act as a barrier to the winds blowing from the ocean, the result being that their moisture is precipitated on the seaward flanks, very little passing over to feed the streams of the interior. As a consequence, the great majority of the rivers of the Western Slope are almost dry for many months of the year, and, notwithstanding their vast watersheds, are narrow and shallow, except when in flood, and in many cases flow in summer for considerable distances more through than above their extensive beds of sand, shingle, and drift. By reason of the gradual slope of the Great Plains westward from the Tablelands the fall of these rivers is but slight (about three feet per mile), and their course is long and sluggish. The rule that holds good in other parts of the world with regard to rivers—viz., that their volume increases with the distance from their source—is violated in the case of these rivers, partly on account of excessive evaporation resulting from the great heat of the plains, and partly on account of the thirsty nature of the soil. As showing what potent factors these are in reducing the volume of our western rivers, it has been shown by the Government Astronomer that only 2 per cent. of the rainfall of the Upper Darling basin passes the town of Bourke. In comparison, therefore, with their length the volume of the rivers of the Western Slope is not very great. They are rarely flooded, and in this respect are in marked contrast with the coast rivers. Many of them, in fact, consist of a chain of ponds for the greater part of the year, and hardly one of the longer tributaries of the Darling reaches the main stream except during floods. Inundations, of course, do occur at intervals in the rivers draining the plains, the Bourke flood of 1890, which caused tremendous damage to stock and buildings, and the Gundagai flood of 1852 (when the whole township was washed away by a

sudden rise of the Murrumbidgee, and 81 lives were lost) being the most noted inundations west of the Tablelands.

Rivers of the Eastern Slope.

The Tweed is situated in the extreme north-east corner of the colony. It consists of the *North*, *South* and *Middle Arms*, the first and last of which rise in the Macpherson Range, while the *South Arm* has its source near *Mt. Burrell* in a low range forming a watershed between the Tweed and the Richmond. After an easterly course of about 30 miles the Tweed enters the Pacific near Point Danger. Vessels drawing not more than six feet of water can trade to this river, but shipping is greatly hampered by the shifting nature of the bar at its mouth. Fine agricultural land occupies the Tweed basin, and the vegetation is rich and tropical. The rainfall is abundant, and the sugarcane is profitably grown in the district. The chief town on the Tweed is Murwillumbah, which is connected by rail with Lismore.

The Richmond consists of three branches—the *Main*, *North*, and *South* Arms. The first mentioned rises in the slopes of Mount Lindsay, the highest peak of the Macpherson Range, and flows in an almost south-easterly direction as far as Casino, where it turns to the east, entering the Pacific at Ballina. The Main Arm is navigable as far as Casino, 62 miles, and the North Arm as far as Lismore, 60 miles from the sea. This river was first explored in 1850 by sawyers in search of cedar, and for many years afterwards its only exports were cedar, ironbark, tallow, and hides. The brushes of the Richmond have yielded the best cedar ever obtained in the colony, and more timber has been sent away from this river than from all the rest of the New South Wales rivers. The upper course of the Richmond lies among rugged pastoral country and heavily-timbered uplands, but the lower portion of its basin consists of a rich alluvial district, where the products of semi-tropical climes grow luxuriantly. Between Ballina and Lismore, and extending eastward to Byron Bay, and northward to the foot of the Macpherson Range, lies an extensive elevated tract of country of remarkable fertility, known as the Big Scrub, clothed with splendid timber and an almost impenetrable jungle growth. The portions of the Big Scrub that have been cleared are found to be admirably suited for the growth of sugarcane and for dairy-farming. Sugarcane, maize, cedar, and other timbers, butter, cheese, bacon, hides, and tallow are the chief products of the Richmond basin.

A bar, which is crossed with difficulty in stormy weather and during easterly gales, obstructs the entrance. The length of the Richmond is about 120 miles, and the area of its basin 2400 square miles.

The CLARENCE is the largest stream on the east coast. Its length is 240 miles, and the area of its basin is estimated at little short of 8000 square miles. It rises in the slopes of *One Tree Hill*, a prominent peak in the Macpherson Range. Flowing in a southerly direction past the Obelisk Mountain, it is joined by the *Maryland*, *Boonoo Boonoo*, *Koreelah*, and *Timbarra* streamlets, all of which have their origin in the Great Dividing Range. It next receives on its right bank the united waters of the *Mitchell*, the *Boyd*, the *Nymboida* (marked on the old maps *Nymboi*), *Guy Fawkes* and *Sara*, the first of which rises in the New England Range near Ben Lomond, while the Nymboida has its origin in the low range dividing the Bellinger and Clarence basins. Some distance below its junction with the Mitchell the Clarence bends to the east, and after receiving the *Orara* and some smaller streams from the south enters the sea at Shoal Bay. Shifting sandbanks accumulate within the Clarence estuary, and at times interfere considerably with shipping. For a distance of 70 miles from the sea the Clarence is a magnificent stream, averaging half a mile in width, and is navigable for ocean-going steamers (drawing not more than 11 feet of water) as far as Grafton, 42 miles, and for smaller vessels to Copmanhurst, 67 miles from Shoal Bay. The upper basin of the Clarence is extremely rugged, but as the river approaches the sea it broadens into a number of picturesque lake-like expansions (*e.g.*, *The Broadwater*), and Chatsworth, Harwood, and Palmer Islands are met with within its estuary. Fine plantations of sugar and maize line the banks of the Lower Clarence, and the whole district is regarded as one of the richest agricultural areas in the colony. Large quantities of gold are obtained in the vicinity of the Orara River and the Bucca and Wana Creeks, within the Clarence basin, and hard woods and cedar are exported largely to the metropolitan market and to New Zealand. In addition to Grafton, the centre of the trade, many other townships are situated on its banks, viz., Solferino, Copmanhurst, Ulmarra, Lawrence, Maclean, and Yamba.

The BELLINGER and the NAMBUCCA are two small rivers about nine miles apart, between the *Clarence* and *Macleay*. Both have their source in the North Coast Range, and the length of each is 40 miles. Cedar and other timbers, together with maize, are the chief products of the surrounding district, but the

nature of the entrance to each of these streams confines the shipping to vessels of small tonnage. The Nambucca is navigable for vessels of light draught as far as Bowra, 30 miles from the sea, and its chief tributaries are Taylor's Arm and Algomera Creek. The principal affluent of the Bellinger is called the South Arm.

The MACLEAY is formed in the main by the waters of the *Guyra*, *Chandler*, *Salisbury Waters*, and the *Apsley*. The first-mentioned rises in the New England Range, near Ben Lomond, and flows in a generally southerly and south-easterly direction for over 60 miles through splendidly-timbered country, being joined on its left bank by the Chandler River, which rises at Chandler's Peak, in the Macleay Range. The Apsley, the southern branch, is a fine stream, rising in the upper portion of the Hastings Range. The upper course of the Apsley is extremely rugged, and is marked by a series of magnificent cascades, the greatest of which has a fall of 240 feet. Some distance below this fall the bed of the river lies between perpendicular cliffs of sandstone, which form the sides of an enormous sunken valley, similar in formation and general appearance to the valleys in the Blue Mountains. Oxley, who came upon this depression during his second journey in 1818, thus describes it :—"This tremendous ravine runs nearly north and south ; its breadth at the bottom does not apparently exceed 100 or 200 feet, whilst the separation of the outer edges is from two to three miles. In perpendicular depth it exceeds 3000 feet. The slopes from the edges were so steep, and covered with loose stones, that any attempt to descend them even on foot was impracticable." After its junction with the Guyra, the united waters flow for a few miles eastwardly under the name of the *Muddy* River, till they are joined by the Chandler. Below this point the stream receives the name of the Macleay, flows east and south-east, receiving the Belmore tributary at the township of Gladstone, and finally enters the sea at Trial Bay. A new channel, made by the great flood of 1893, now forms the only practicable entrance to the river. The total length of the river is estimated at 200 miles, and its drainage area is about 4600 square miles. The lower basin of the Macleay consists of magnificent alluvial plains, yielding maize, sugarcane, and dairy produce in abundance. Vessels drawing seven feet of water can trade to this river, which is navigable as far as Greenhills, a township 30 miles from the sea. The chief towns on the Macleay are Kempsey and Frederickton.

THE CLARENCE AT MACLEAN.

The HASTINGS has its source in the Hastings Range, and after a course of 70 miles through rich undulating country, well timbered with cedar and mahogany, flows into the sea at Port Macquarie. It passes in the lower part of its course through patches of rich alluvial soil. The chief tributaries of the Hastings are *Forbes River* and *Morton's Creek* on the left bank, and *Ellenborough River* and *Thone Creek* on the right.

The MANNING rises near Paddy's Ridge in the Mount Royal Range. It flows in the main easterly, and after a course of 100 miles enters the ocean by two mouths, the Harrington and Farquhar Inlets. The latter of these channels has not been used by steamers for many years, Harrington Inlet being the safer port and less obstructed by sandbanks. Vessels of seven feet draught can trade to Wingham, 20 miles inland. The Manning receives on its right bank the united waters of the *Barrington*, *Gloucester*, and *Avon Rivers* from the Mount Royal Range and its offshoots, but its largest tributary is the *Barnard*, which has its source near Ben Hall's Gap, close to the eastern extremity of the Liverpool Range, and about 12 miles south of Nundle. The *Nowendoc*, *Rowley's*, *Lansdowne*, and other small streams also join it on the left bank. The area of the Manning basin is estimated at 3000 square miles, consisting in its upper portion of undulating and densely-wooded tracts, while along its banks as it approaches the sea extensive level patches of great fertility are met with. The delta formation at its mouth consists of Mitchell, Oxley, Jones, and Dumaresque Islands. The chief towns on the Manning are Taree, Wingham, Tinonee, and Cundletown.

The KARUAH rises in the Mount Royal Range, and after a course of 45 miles in a southerly direction, through good agricultural and pastoral country, empties itself into the head of Port Stephens. It flows past the township of Stroud, and is fed by the *Deep*, *Lawler*, *Pipeclay*, and *Limeburners' Creeks*.

The HUNTER is probably the most important river in the colony. It was named after Governor Hunter, during whose administration it was discovered by Lieutenant Shortland, in 1797. It rises in the Mount Royal Range, close to Paddy's Ridge, and within a mile or two of the source of the Manning. It flows first in a south-westerly direction (receiving *Page's River* from the Liverpool Range above Murrurundi) past Muswellbrook and Denman, and is joined about three miles below the latter by the *Goulburn*, issuing from the Main Range

about 20 miles north-east of Mudgee. Below the Goulburn junction the direction of the river is eastward, and it finally enters the sea at Port Hunter, on which stands the city of Newcastle. Its length is over 200 miles, and its tributaries are—in addition to the Goulburn—the *Williams*, the *Paterson*, and the *Wollombi*, besides numerous smaller streams from the Mount Royal, Liverpool, and Hunter Ranges. The main stream is navigable for fairly large ocean-going vessels as far as Morpeth, 35 miles from the sea, while the Williams and the Paterson are both navigable for smaller vessels, the former from Raymond Terrace to Clarence Town (20 miles), and the latter from Hinton to the township of Paterson (18 miles). The upper valley of the Hunter is hilly, but its lower portion consists of rich low-lying alluvial flats, many parts of which, near the river banks, possess soil of great fertility. The lower portion of its basin is also celebrated as being the most productive coalfield of Australia. The total extent of the Hunter basin exceeds 11,000 square miles, an area more than twice as large as the basin of the Thames. The low-lying alluvial flats are, unfortunately, liable to be flooded in times of unusually heavy rainfall. The most disastrous of these inundations was that of 1893, when, owing to the sudden and simultaneous swelling of both its upper and its lower tributaries, almost the whole of the district between West Maitland and Newcastle was converted into a vast inland sea, and hundreds of settlers were rendered homeless. A few miles above its mouth the Hunter is divided into two streams by a number of islands, the largest of which is called Ash Island. These two streams unite, however, near the sea, and form the capacious harbour of Newcastle. In the opinion of geologists, the lower basin of the Hunter from Newcastle inland to beyond West Maitland was at one time a vast estuary, which has long since been filled up by the alluvial deposits of ages.

The HAWKESBURY is the most circuitous of all the coastal rivers of New South Wales. The different names by which various portions of this fine stream are known were bestowed by the early explorers before it was ascertained that they formed in reality but one river. It rises, in the first instance, under the name of the *Wollondilly*, at Mount McAlister, in the Cullarin Range, about 20 miles north-west of Goulburn, and flows past that city, watering the rich and well-known Goulburn Plains. Some distance below Goulburn it receives the *Mulwarree* from the south, and soon afterwards takes a northern course, receiving

THE HUNTER RIVER NEAR MORPETH.

on the left bank the *Cookbundoon* from the Cullarin Range, and on the right the *Wingecarribbee* from the western flanks of the Illawarra Range. The Wollondilly then flows through the picturesque sunken valley of Burragorang, receiving on its way the *Nattai* and a few smaller streams. After leaving this valley it receives from the west *Cox's River*, which drains the southern portion of the Blue Mountains; and below the junction of this tributary the main stream becomes known as the *Warragamba*. Under this name it flows north-east for some distance till it is joined by the *Nepean*, which brings as its tribute the combined waters of the *Cordeaux*, *Cataract*, and several other streams, all taking their origin in the western slopes of the Illawarra Range, some of them at points distant only two or three miles in a direct line from the coast. "It would be difficult to conceive scenery more beautiful than that which characterises the junction of the Nepean and the Warragamba. The Blue Mountains close in upon the river, while the latter winds round about all the points and corners as though loath to leave places so pleasant." Though smaller than the Warragamba, the Nepean gives its name to the united waters of the two streams, which now flow northerly along the base of the Blue Mountains, through rich alluvial flats devoted mainly to the cultivation of maize and lucerne. In this part of its course the Nepean receives from the Blue Mountains the *Grose* and the *Colo*, and from the junction of the former the river receives the name of the Hawkesbury. From the Colo junction it flows north till it receives on its left bank the waters of a fine stream—the *Macdonald*—below which its general direction is eastward till it enters the ocean at Broken Bay. The total length of this singularly tortuous river is 330 miles, and its drainage area is estimated at 8000 square miles. The estuary of the Hawkesbury forms a fine harbour with two extensive branches, Brisbane Water and Pittwater. The Hawkesbury is navigable for small vessels as far as Windsor, 70 miles from the sea, and the scenery amid the wild, broken country in the lower course of the stream, where wild, rocky bluffs rise steep and precipitous from the water's edge and the shores are pierced by numerous winding offshoots, is picturesque and highly beautiful. This portion of the Hawkesbury has struck several well-informed travellers as bearing a strong resemblance to the Rhine. Writing about it, Anthony Trollope remarked:—"The Hawkesbury has neither castles nor islands, nor has it bright, clear water like the Rhine. But the headlands are higher and the bluffs are bolder, and the turns and manœuvres of

THE HAWKESBURY RAILWAY BRIDGE.

the course which the waters have made for themselves are grander, and, to me, more enchanting than those of the European river." About eight miles above its mouth the Hawkesbury is crossed by a magnificent seven-spanned iron bridge, belonging to the Great Northern Railway System.

The SHOALHAVEN, whose estuary was discovered by George Bass during his "whaleboat expedition" in 1797, is the largest and most important river on the sea coast south of Sydney. It rises in the Eurambene Mountain, in a spur which leaves the Gourock Range in latitude 36° S. It flows first north, draining that part of the Southern Tableland which lies between the Gourock and Currockbilly Ranges. On reaching the northern extremity of the latter it turns sharp to the east, and, flowing through rich low-lying agricultural and pastoral lands, empties into the ocean by a wide, shallow estuary. In its upper course the Shoalhaven flows through wild mountain country and deep gullies, many of which descend nearly 1500 feet, and are marked by magnificent scenery, typically Australian. The Shoalhaven Gullies possess the additional merit of being auriferous. A canal, which is continually being broadened by the erosive action of the river current, connects the Shoalhaven with the Crookhaven, five miles further south, and through this the greater part of the waters of the main stream reach the ocean. The length of the river is estimated at 260 miles, and its chief tributaries are the *Jembaicumbene*, *Mongarlowe*, *Corang*, *Endrie* and *Kangaroo Rivers*, while near the sea it is joined by *Broughton Creek*. On account of a bar and numerous shallows, navigation is confined to small steamers, which trade as far as Greenwell Point, on the Crookhaven, three miles from the sea and 10 miles below Nowra, of which it forms the port. Nowra, not far from the present terminus of the South Coast Railway, is the largest town on the Shoalhaven.

The CLYDE rises in the Pigeon House Mountain, and, after a southerly course of 70 miles through rich, undulating, country, flows into Bateman's Bay. It is fed by the *Cockwhy*, *Currowan*, *Nelligen*, and *Buckenbowra Creeks*, and small vessels can trade a few miles up the river. The upper basin of the Clyde is auriferous, while the flats skirting its lower course are devoted to dairy-farming and agriculture. Bateman's Bay and Nelligen are towns of importance on the Clyde. It is also the outlet by water for much of the produce of the Araluen, Braidwood, and Queanbeyan districts.

The Moruya is formed by the united waters of the *Deua River* (its principal branch) and *Araluen Creek*. The former rises about seven miles north-west of Nerrigundah, and flows northwards to its junction with Araluen Creek. Araluen Creek takes its rise in the mountainous district near Araluen, and drains the well-known sunken valley of the same name. In the lower part of its course the Moruya flows through country well suited for agricultural and dairy purposes, and enters the sea by a wide estuary, which, on account of shoals and sandbanks, is of little use for navigation. The length of the Moruya, including the Deua branch, is about 80 miles. The splendid granite columns on the George-street and Moore-street sides of the Sydney Post Office were obtained from a quarry on the Moruya.

The Tuross rises in the Barren Jumbo Mountain, a bare, rocky peak in the Gourock Range, and, after flowing in a north-easterly direction for 60 miles, enters the sea by a wide, open estuary. This river flows in its upper course through the "Gulf of Tuross goldfields," while the lower portion of its basin consists of rich alluvial country, splendidly grassed and timbered, and well suited for agriculture. The mouth of the Tuross is impeded by a bar.

The Bega is formed by the junction of the *Bembooka* and *Brogo Rivers*, which unite at the town of Bega Thence the river flows eastward to the ocean, which it enters near Tathra. The Bembooka, which is the longer branch, rises in the South Coast Range near Mount Nimitybelle, and flows through rich agricultural and pastoral country. The estuary of the Bega is only navigable for small vessels, and the total length of the river is 60 miles.

The Towamba is a fine stream 40 miles in length, rising in the South Coast Range and flowing south-easterly into the southern arm of Twofold Bay. The chief feeders of this river are the *Wog Wog*, *Jingo*, and *Matagana Creeks*. Boydtown, the seat of a once flourishing whaling industry, but now an almost abandoned settlement, stands near the estuary of the Towamba. The basin of the river consists of good agricultural and pastoral country.

The Rivers of the Southern Slope.

The Snowy River drains that portion of the Southern Tableland lying near the S.E. corner of New South Wales, and bounded on the east, north, and west by the South Coast, Monaro, and

Muniong Ranges respectively. This river rises on the slopes of Mount Kosciusko, flows north till it receives the *Eucumbene*, then sweeps first south-easterly and afterwards south-westerly till about 18 miles south-east of The Pilot it crosses the southern boundary of the colony, whence its general direction is southerly, through Gippsland, to the Tasman Sea. Its total length is probably about 230 miles, 130 of which belong to New South Wales. It is in the main snow-fed, and its flow is liable to sudden changes from the rains and the melting of the snow on the high mountain slopes by which it is encompassed. Its upper basin, which is in parts auriferous, is too rugged for agriculture, but is found suitable for pasturage. Its chief tributaries are the *Eucumbene*, *Crackenback*, *Mowamba*, and *Jacobs Rivers*, from the Muniong Range; the *Bobundara*, and *Maclaughlin*, from the Monaro Range; and the *Bombala* and its tributaries, from the South Coast Range. The chief centres of settlement in the New South Wales portion of its basin are Bombala, Delegate, and Buckley's Crossing.

The Rivers of the Western Slope.

The Murray River basin includes the whole of the western portion of New South Wales, stretches northward to the centre of Queensland, and embraces a very large portion of northern Victoria. The river, in its upper course, is composed of three branches—the *Indi*, the *Hume*, and the *Tooma*. The Indi, which is the longest branch, rises in a gully near The Pilot, at an elevation of 5000 feet above sea-level; while the other two branches have their respective sources in the western and northern slopes of Mount Kosciusko. From the confluence of these three rivers the Murray descends towards the alluvial plains below Albury, receiving numerous mountain torrents. Thence, after pursuing a westerly course as the southern boundary of the colony, and receiving the *Murrumbidgee* and *Darling* on its right bank, it passes into South Australia, and eventually discharges its waters into Lake Alexandrina. "From its farthest source at the foot of The Pilot to the town of Albury, the Murray has a length of 280 miles; thence to the Darling River junction its course is 852 miles; and from that point to the sea, below Lake Alexandrina, it is 587 miles in length. The river has thus a total course of 1719 miles, of which 1250 are within New South Wales. The river has been navigated as far as the Ournie goldfield, about 150 miles above Albury, and 1590 miles

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Kerry, Sydney.

A CAMEL TRAIN—WARREGO DISTRICT.

from its mouth."* The chief Victorian feeders of the Murray are the *Mitta Mitta*, the *Ovens*, the *Goulburn*, and the *Campaspe*. Of all Australian rivers it has the greatest volume of water, fed as it is by the snows and heavy rains of the Kosciusko Plateau, and it has never been known by either blacks or whites to stop running.

The fall of the Murray between Albury and the Darling junction is less than six inches in the mile, and this circumstance, as well as the loose nature of the soil, has led in the course of ages to the formation of a network of ana-branches, intersecting the country in every direction between the Murray and the Murrumbidgee. The largest of these is the *Edward River*, which after an independent course of 150 miles, receiving on its way the united waters of *Yanko Creek* and the *Billabong*, returns at length to the main stream a few miles above the Murrumbidgee junction. By means of the Edward River and the Billabong and Yanko Creeks the Murray receives the drainage of the fertile and extensive pastoral district of Riverina.

In the upper part of its course the river flows through high, rocky cliffs, where the Murray Gates (a perpendicular chasm in the mountains) overhang the infant stream 3000 feet. The lower basin of the river is essentially a pastoral one, the land being well grassed and well watered. Large forests of red gum extend for some distance inland from both banks of the river to the boundaries of tracts subject to flooding, while beyond, the plains are covered at intervals with belts of box trees.

The Murray was discovered by Hume and Hovell in 1824, who crossed it at a point north-east of Albury. It then received the name of the Hume. It was subsequently explored in 1829 by Captain Sturt, from the Murrumbidgee junction to Lake Alexandrina. It was Sturt who, in honour of Sir George Murray, at that time Secretary of State for the Colonies, gave the river its present name.

The DARLING is formed by the union of several streams, which drain an extensive basin, stretching from the latitude of Bathurst northward into Queensland. This great watercourse, like most large Australian rivers, is known by different names in different parts of its course, the term Darling being only applied to that portion of the river below the *Bogan* junction. Its remotest feeder is the *Condamine*, which rises in the western flanks of Wilson's Peak, near Warwick. The Condamine flows first in a generally northern direction for a considerable

* Coghlan's *Wealth and Progress of New South Wales.*

THE DARLING AT BOURKE.

distance, then turning westward and afterwards southward, it flows towards the Darling, becoming known in its lower course as the *Culgoa*, which joins the main stream about 20 miles above Bourke. Although the Culgoa branch is the largest, the *Barwon* arm has the greatest volume of water. The name Barwon is given to the main stream between the Bogan and *Gwydir* junctions. Above the Gwydir it is known as the *Macintyre*, which rises near Ben Lomond, on the Northern Tableland. About half-way between the townships of Bengalla and Boggabilla the Macintyre is joined by the *Dumaresq*, a fine stream taking its rise near the Queensland border, not far from the head of the Richmond. A remarkable circumstance in connection with the Darling is that from the Culgoa junction to its confluence with the Murray at Wentworth, this great watercourse has not a single permanent tributary—the *Paroo* terminating in swamps about 40 miles north-west of Wilcannia, and, like the *Warrego*, only reaching the main river during great floods. Thus "for over 1000 miles this great river holds its solitary course, Nile-like, feeding the thirsty plains of the south with water falling many hundred miles distant on the downs of Queensland." Another point deserving of notice is the fact that its banks are in many parts higher than the surrounding plains; indeed, the river bed itself, though from 30 to 40 feet beneath the bank, is in some places but little below the general level of the adjacent country, and, strange as it may seem, during floods the river banks are often the only dry land visible for miles. During periods of long continued dry weather, this fine stream suffers not only in length but also in volume, and dwindles above Menindie to a succession of reaches with little or no flow between them, and in some places exists only as a mere chain of waterholes. The Darling is navigable during freshets as far as Walgett, distant 2345 miles from the sea, and its total length is estimated by Mr. H. C. Russell, the Government Astronomer, at 3282 miles. In order to make the Darling more serviceable as a commercial highway throughout the whole year, works are about to be undertaken to form a series of "locks" along its middle course. All the plain country within its basin is occupied by squatters as sheep runs, and much of their produce is sent down it to Victoria and South Australia. The chief tributaries of the Darling within the limits of New South Wales are the *Gwydir*, *Namoi*, *Castlereagh*, *Macquarie*, and *Bogan*, all of which, on account of their size and importance, will be separately treated. The Darling was discovered and explored for a short distance in 1829

by Captain Sturt, who gave it the name it has ever since borne, in honour of Sir Ralph Darling, at that time Governor of the colony. Its confluence with the Murray was indisputably established by Sir Thomas Mitchell in 1835.* Brewarrina, Bourke (the present terminus of the Great Western Railway), Wilcannia, Menindie, and Wentworth are important towns on it banks.

The GWYDIR (445 miles) rises in the New England Range, near the Rocky River goldfields, and flows in a north-westerly direction to the *Barwon*, receiving throughout its course numerous small tributary streams from the Nandewar and New England Ranges. The chief of these are the *George's*, *Warialda*, and *Mosquito* on the right, and the *Horton* and *Wee-Waa* on the left bank. In the lower part of its course the Gwydir sends off several ana-branches, which, after feeding some extensive swamps, unite again with the main stream before the Barwon is reached. The greater portion of its basin consists of good agricultural and pastoral country, while of its tributaries, some (*e.g.*, the *Bingara*) are well wooded and clothed with gum forests, and others are auriferous. Bingara, noted for its diamonds, is situated on the Gwydir, and Moree, the present terminus of the North-Western Railway, is two miles distant from its banks.

The NAMOI rises, under the name of the *Macdonald*, near the south-eastern extremity of the Moonbi Range. For some distance the *Macdonald* flows northward, becoming known at length as the *Maluerindi*. After rounding the northern extremity of the Moonbi Range the *Maluerindi* is joined by the *Warrabah Creek*, about 15 miles north-east of the township of Manilla, and then becomes known as the *Namoi*, which, after a course of 600 miles in a northerly and north-westerly direction, joins the *Barwon* near Walgett. It receives in its middle and upper course numerous tributaries, the chief of which are the *Peel* (issuing from the Moonbi Range), the *Mooki* (or *Conadilly*), the *Terabeille*, and the *Manilla*. Its upper basin is very rugged and in parts auriferous, but it opens out below Gunnedah into rich undulating pastoral country for about 80 miles. Then the land changes on the south bank to sandy plains, interspersed with clumps of pine and mallee, while the north bank is flanked by good pastoral land as far as the Barwon. The Liverpool Plains, discovered by Allan Cunningham in 1825, and long noted for

* That a large river (supposed then to be the Darling) joined the Murray in the far west, had been observed by Sturt and Macleay in 1829.

their fertility, lie within the basin of the Namoi. The chief towns on this river are Manilla, Gunnedah, Narrabri, Wee Waa, and Walgett, while Tamworth is on its chief tributary, the Peel.

The CASTLEREAGH rises in the southern slopes of the Warrumbungle Range, within a few miles of Coonabarabran, and after a tortuous course of about 365 miles, joins the *Barwon*. It was discovered in 1818 by Oxley, and its dry bed was followed for some distance by Captain Sturt during the terrible drought of 1828. It receives numerous small tributaries, among which may be mentioned the *Gulargambone* and *Coonamble Creeks*. The prevalence of floods and droughts alternately renders the profitable occupation of a good deal of the Castlereagh basin difficult. The full volume of the river is only seen during floods; in dry seasons it dwindles into a succession of waterholes, separated from one another by long reaches of drift sand. Below Mundooran and onwards almost as far as Coonamble, it flows between black-soil banks in a bed about 200 feet wide, while 25 miles below Coonamble it is merely a narrow gutter that one could easily jump across, and indeed for many years in succession never reaches the Barwon at all. In the upper part of its course the river flows through deep, precipitous gorges of basalt with occasional large swamps and grassy tracts devoted to squatting. Coonabarabran, Coonamble, and Gilgandra are situated on the Castlereagh.

The MACQUARIE (750 miles) is formed by the union of the *Fish* and *Campbell's Rivers*, both of which, rising in the Main Range near *Shooter's Hill* (eight miles south-west of the Jenolan Caves), unite near White Rock, a few miles from Bathurst. The land on both sides of these rivers is rugged, though clothed in parts with fine grass. Beyond Bathurst the Macquarie is joined on its right bank by the *Turon*, *Pyramul*, *Cudgegong*, *Talbragar*, and *Coolbaggie Rivers*, and on the left bank by the *Lewis Ponds* and *Bell Rivers*, and numerous smaller streams. From the Talbragar junction onwards the Macquarie flows north-easterly through wide level plains studded with belts of wattle and gum scrub, and finally loses itself in a big swamp, which in flood time drains by numerous watercourses into the *Barwon*. This swampy region is known as the *Macquarie Marshes*. Before reaching Dubbo the action of the Macquarie as a geological agent is erosive, while below Dubbo it is constructive, depositing in flood time successive layers of sediment and affording a practical demonstration of the manner in which the great basin, now occupied

A SCENE ON THE MACQUARIE.

Wagga to the Lachlan junction the river passes through the rich and fertile Riverina district, and in this part of its course much of its water escapes during flood time into numerous billabongs or shallow watercourses, which drain a wide area. Its lower basin consists of good pastoral and agricultural land, all occupied by a thriving and enterprising population. At intervals along its lower course belts of stunted gum, mallee scrub, and saltbush are met with; and often in very dry seasons the stream is reduced to a mere chain of waterholes, even as far down as Hay. Captain Cadell opened up the navigation of the Murrumbidgee in his steamboat *Albury*, as far as Gundagai, in 1858, since which a fleet of small river steamers has been plying to and from South Australia. The confluence of this river with the Murray was established by Captain Sturt during his well-known sail from Yass Plains to Lake Alexandrina in 1829.

LAKES.

New South Wales is singularly deficient in lakes; even those that the colony can boast of are small, and many of them are by no means permanent. Omitting all mention of the so-called lakes of the Coast District—which have been dealt with already under the heading of "Lagoons"—the lakes of the colony belong to two systems—(i.) those of the Mountain Regions, and (ii.) those of the Western Plains. The lakes of both systems shrink considerably in periods of great drought.

A.—Lakes of the Mountain System.

These belong to the Southern Tableland entirely, and are situated within a few miles of Goulburn, Queanbeyan, and Braidwood. The largest is Lake George, occupying the southern portion of a depression in the Cullarin Range, called the Lake George Basin, 490 square miles in extent, and the solitary example in the colony of a purely inland drainage area, watered as it is by several small streams but having no visible outlet. The lake, whose waters are brackish and unfit for drinking purposes, stands at an elevation of 2200 feet above sea level, and is 16 miles long and six miles across at its widest part, while its area is about 40 square miles. It is said that Lake George was quite dry during the period of prolonged drought between 1846 and 1849, and again for a short period in 1850 On account of the beauty of the surrounding scenery, it is now a favourite tourist

resort. It lies about 25 miles south-west of Goulburn, and four miles from Bungendore on the Cooma line. The ridge that flanks its western shores is far more rugged and broken than the one which bounds it on the eastern side. The Breadalbane Plains occupy the northern portion of the Lake George Basin.

Lake Bathurst, which was discovered by Hamilton Hume in 1817, lies about 10 miles east of Lake George. In ordinary seasons its area is about 15 square miles, but it shrinks considerably in continued dry weather. It is surrounded by fertile plains, 2000 feet above the sea, and is 20 miles south of Goulburn, and a mile and a half from the township of Tarago.

Tarago Lake, a small sheet of water, situated in the parish of the same name, is four miles E.N.E. of Collector and 16 miles S.W. of Goulburn.

Lake Burra Burra is another small sheet of water, situated on the western flank of the Main Range, six miles N.N.W. of Taralga.

B.—Lakes of the Western Plains.

These are met with chiefly along the lower courses of some of the larger western rivers. They occupy as a rule insignificant depressions (filled with the flood-waters of widely-expanding river channels), and act in turn as feeders to the rivers when the inundations have subsided. As the flood-waters evaporate with amazing rapidity in dry weather, many of them are for the greater portion of the year only extensive mud basins, covered in part with saline incrustations. From these considerations it is clear that their area cannot be stated with accuracy ; they vary with the rainfall, covering extensive areas in wet seasons, and are reduced to a few waterholes, and even completely dried up, in times of drought. Along the Darling, between Bourke and Wentworth, are *Lakes Poopellae* and *Gunyulka* on the left bank, and *Laidley's Ponds*, *Cawndilla*, and *Menindie* on the right.

Within the Lachlan basin *Lakes Cowal* and *Cudgellico* are the most important ; while in the extreme south-west corner of the colony is *Lake Victoria*, which depends for its water supply upon the overflow of the Murray. Lake Cowal receives from the south the drainage of an extensive plain called *The Bland*.

GEOLOGY.

The sedimentary rock formations of New South Wales may be classified in descending order as follows :—

Period.	System.	Where Developed.
Cainozoic.	POST TERTIARY — Recent	Gravel, sand, mud, &c., now accumulating.
	POST TERTIARY — Pleistocene	Alluvial flats, raised beaches on New South Wales coast.
	TERTIARY — Pliocene	Many basaltic districts of New South Wales.
	TERTIARY — Miocene	Beds underlying Pleistocene deposits near Wentworth.
	TERTIARY — Eocene	Plant beds near Emmaville; region around junction of Darling and Murray Rivers.
Mesozoic or Secondary.	UPPER CRETACEOUS	White Cliffs Opal Field, Wilcannia.
	LOWER CRETACEOUS	Artesian water beds in north-western New South Wales.
	JURASSIC	Fossil-fish beds, Talbragar River, about 20 miles north of Gulgong.
	TRIASSIC — 1. Wianamatta shales	County of Cumberland.
	TRIASSIC — 2. Hawkesbury sandstone; Clarence River coal beds.	
	TRIASSIC — 3. Narrabeen shales	Cliffs near Lake Narrabeen.
	TRIASSIC — 4. Artesian water beds	Coonamble, Moree.
Palæozoic or Primary.	PERMO-CARBONIFEROUS — 1. Upper Coal Measures	Newcastle, Bulli, Lithgow, and Sydney.
	PERMO-CARBONIFEROUS — 2. Middle Coal Measures	East Maitland and Tomago.
	PERMO-CARBONIFEROUS — 3. Upper Marine Series	Maitland and Illawarra districts, and Bundanoon.
	PERMO-CARBONIFEROUS — 4. Lower Coal Measures	Greta, West Maitland, and Clyde River.
	PERMO-CARBONIFEROUS — 5. Lower Marine Series	Greta district,
	CARBONIFEROUS	Port Stephens district; the Copeland and Bingara goldfields.
	DEVONIAN	Mt. Lambie, near Rydal.
	SILURIAN	Jenolan, Wombeyan, and Yarrangobilly Caves; Limestones of Yass and Molong.

A long belt of *Palæozoic rocks*, into which granite and other igneous rocks in many places intrude, extends in a general north-easterly direction along the greater part of the Coast district and tablelands, with formations of later date overlying them. This series has an average breadth of about 200 miles. Another belt of primary rocks traverses the central portion of the western plains, from about Condobolin to the Darling, in a direction for the most part at right angles to the eastern belt.

The *Upper Silurian* beds, which appear to be the oldest sedimentary rocks yet found in New South Wales, occur for the most part west of the tablelands in the upper courses of the Murrumbidgee and Lachlan, and extend northwards into the Bathurst, Hill End, and Mudgee districts. They also occur in the basin of the Namoi, at Milparinka, near Bateman's Bay in the South Coast district, in the basin of the Clyde, in the Upper Shoalhaven Valley, and near the source of the Macleay River. The Upper Silurian rocks consist for the most part of reddish and purplish sandstones, slates, and limestones, and in them occur our chief metalliferous deposits, viz., gold, silver, tin, copper, lead, and antimony. The limestone beds, in which the Jenolan, Wellington, Yarrangobilly, and Wombeyan caves occur, as well as the old coral reefs near Yass, are of Silurian age, and are chiefly composed of crinoids and corals which once lived in countless myriads in the warm waters of a deep sea, which at that time covered this portion of New South Wales. The Silurian rocks as a rule have undergone much disturbance, and are generally inclined at a high angle. Silurian fossils may be found in abundance near Yass, which is the "type district" for rocks of this age.

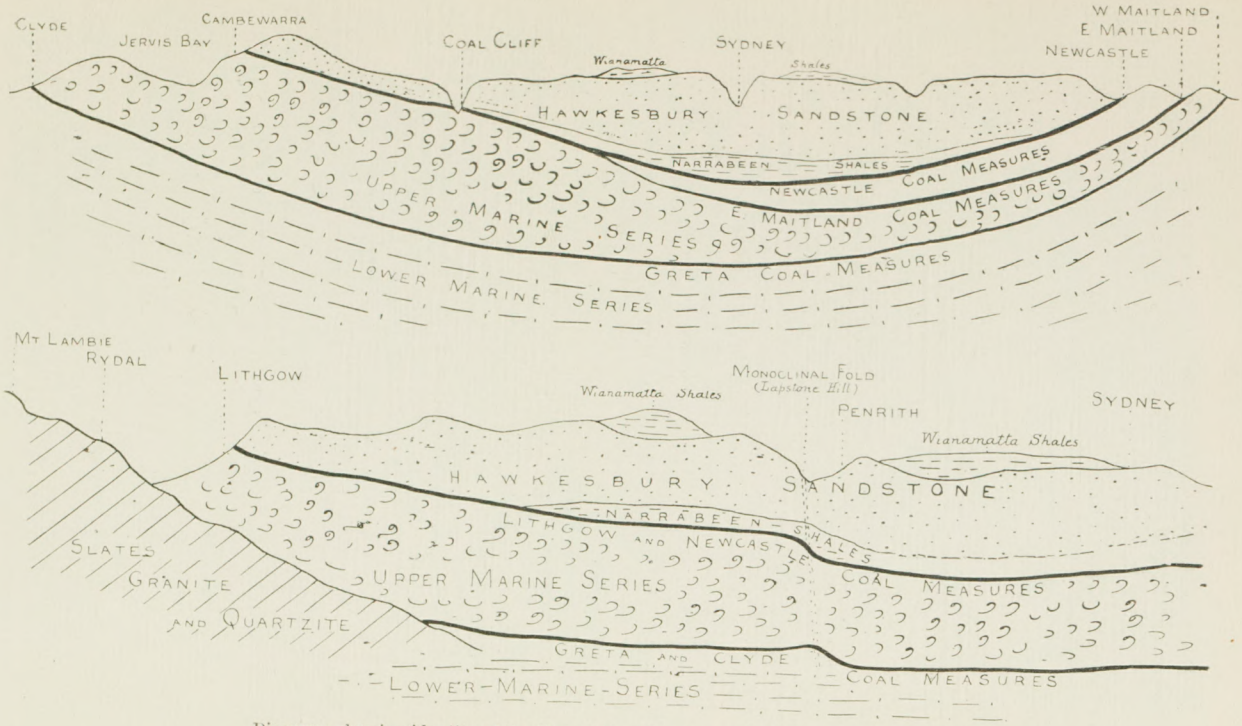
Rocks of *Devonian* age are well developed near Rydal, and along the base of the western escarpment of the Blue Mountains between Capertee and Hartley. Lower Devonian rocks also form the summits of Mt. Lambie and Mt. Walker, and have also been found on the Cudgegong and Turon Rivers and in parts of the Yass and Goulburn districts. Rocks of this age, like those belonging to the Upper Silurian period, are traversed by metalliferous lodes and quartz reefs in the vicinity of intrusive dykes. Like the Silurian rocks they also are folded, but not usually tilted very greatly from their original positions. At Tarago, in the Goulburn district, and at Broombee and Wilbertree, near Mudgee, deposits of limestone occur which contain both Silurian and Devonian fossils, and have consequently been classed provisionally as *Siluro-Devonian Passage Beds*.

The *Carboniferous* strata are extensively developed between the Hunter and Manning Rivers, where they form high, broken ranges. They consist of conglomerates, sandstones, limestones, and shales, tilted at all angles. These are all of marine origin, and are interbedded with tuffs and lavas and intersected by metalliferous lodes containing gold, silver, copper, lead, antimony, &c. The Copeland and Bingara goldfields are situated in rocks of Carboniferous age With the exception of the beds of iron-ore associated with Permo-Carboniferous rocks at Wollongong, Wallerawang, and a few other places, no *lodes* containing metals of economic value are met with, as far as is known, in any rocks of later age than the Carboniferous. Throughout the whole extent of the Carboniferous formation no workable coal seam occurs. The seams met with are too full of bands and of too dirty a character to be of any economic value ; in fact, no workable coal seams occur in New South Wales below the Permo-Carboniferous formation.

The term *Permo-Carboniferous* is applied to an extensive series of New South Wales strata containing fossil remains, both of the Permian and Carboniferous types.

The system extends along the coast between the Clyde and Hunter River districts, and stretching inland to Lithgow and Mittagong, in the Southern Tableland. It contains the colony's enormously productive coal seams. The Permo-Carboniferous system comprises in descending order (i.) the Upper (*i.e.*, Newcastle, Illawarra, and Lithgow) Coal Measures; (ii.) the Middle (*i.e.*, East Maitland or Tomago) Coal Measures; (iii.) the Upper Marine Beds; (iv.) the Lower (*i.e.*, Greta and Clyde River) Coal Measures; and (v.) the Lower Marine Beds. The rocks of the series form an enormous basin, dipping from Newcastle southwards to Sydney (which appears to form the centre of the basin), thence rising gradually towards the surface. The Upper Coal Measures, for instance, which are found at the surface at Newcastle, dip southwards towards Sydney (where they are 3000 feet below the surface), rise again further south, and reappear at Clifton and Bulli, in the Illawarra district. They continue to rise through Illawarra as far south as the Cambewarra Mountains, where they crop out at an elevation of 1500 feet in the face of the ranges. In the Newcastle district the six more important seams belonging to the Upper Coal Measures are, in descending order, the following: (i.) Parbury's seam; (ii.) Great Northern seam; (iii.) Burwood seam; (iv.) Dirty seam; (v.) Yard seam; and (vi.) Borehole seam. The Upper Coal Measures extend westward to the Lithgow district. Deposits of kerosene shale occur in them at Joadja, Hartley, and Capertee. The East Maitland or Tomago Coal Measures—so called because they are developed and worked in those districts—underlie the Newcastle Coal Measures, from which they are separated by a well-defined formation 2000 feet in thickness, to which the name of the *Dempsey Beds* has been given. They also dip southward from the Hunter River district, but probably thin out as they proceed, for they have not been recognised in Illawarra. The Upper Marine Beds are about 5000 feet thick, and are usually divided in descending order as follows: (i.) Crinoid Beds, (ii.) Spirifer Beds, (iii.) Muree Rock, and (iv.) Conglomerates. They may be seen extensively developed in the Maitland and Illawarra districts. Underlying the Upper Marine Series are the Greta (or Clyde River) Coal Measures. The coal seams belonging to this series are worked at Greta and close to West Maitland. They probably dip southward towards Sydney, and rise again on approaching Illawarra, but they do not appear above sea-level till they reach the valley of the Clyde River, in the Ulladulla district. The Lower Marine Series attain a thickness of about 2000 feet, and are extensively developed in the Greta district. Overlying the Permo-Carboniferous rocks are the *Narrabeen Shales* and the *Hawkesbury Sandstone*, whose combined thickness at Sydney has been proved by a bore put down at Cremorne, on the northern shores of Port Jackson, to be nearly 3000 feet. One of the most characteristic plant fossils of the Permo-Carboniferous period is the *glossopteris*.

The *Mesozoic* rocks of New South Wales comprise the *Triassic* and *Cretaceous* formations, the former consisting of the *Wianamatta Shales*, the *Hawkesbury Sandstone*, the *Narrabeen Shales*, and the *Clarence River Coal Measures*. The Wianamatta shales, the Hawkesbury sandstone, and the Narrabeen shales taken together, form what is known as the *Hawkesbury*



Diagrams showing identity of the Newcastle, Illawarra, and Lithgow Coal Measures.

NOTE.—The above are not drawn to scale—they are merely diagrammatic.

Series. The Narrabeen Shales are overlain by the Hawkesbury Sandstone, and dip inland towards the south-west, thinning out as they proceed. They consist of red, chocolate, blue, and grey shales, and form the prominent cliffs along the coast north of Sydney, from Long Reef (near Narrabeen) to Broken Bay; they may also be seen in the district north of Clifton, through which the South Coast Railway passes, and along the face of the Illawarra Range as far south as the Saddleback Mountain, south-west of Kiama. Numerous impressions of plant-remains, as well as a bivalve *Estheria Coghlani*, occur in the Narrabeen Shales. Their reddish colour is due to the presence of oxide of iron derived from the volcanic dust which was doubtless blown from volcanoes in eruption during their deposition. The Hawkesbury Sandstone extends from Sydney on all sides for a distance of about 70 miles and, roughly speaking, comprises the whole valley of the Hawkesbury River. It consists of greyish and yellowish-white sandstone, which is extensively used for building purposes. Indeed, Sydney, which is built upon these rocks, has been described as "a city surrounded by a wilderness of sandstone quarries." The Hawkesbury Sandstone is of estuarine origin and contains the remains of fish and plants, the most characteristic of the latter being the *Thinnfeldia odontopteroides*. Gold, but not in payable quantities, was found by Professor Liversidge in sandstone from the Pyrmont Quarries. Its thickest portion is at Sydney, and within it occur the magnificent gorges of the Blue Mountains and the splendid harbours of Port Jackson and Broken Bay, which are in reality old river valleys (like the Grose Valley in the Blue Mountains) that sank probably at the close of the Tertiary epoch along with the whole of the adjacent coastal district.

The Wianamatta Shales appear to have been deposited in hollows worn by denudation out of the Hawkesbury Sandstone, which they overlie for several miles north-west and south of Sydney. They are of fresh water origin, and form the cappings of the hills throughout the greater part of the County of Cumberland. A small outlier of these shales, 80 feet in thickness, is met with overlying the Hawkesbury Sandstone at Springwood, in the Blue Mountains, and an outlier of the Hawkesbury Sandstone itself occurs near Dubbo. An importance, from an economic point of view, attaches to the Wianamatta Shales by reason of their extensive use in brick and pottery making. Wianamatta is the aboriginal name for South Creek, a small tributary of the Hawkesbury, where the Rev. W. B. Clarke found the shales well developed. On the Clarence and Richmond Rivers occur a series of rocks of the same age as the Hawkesbury Sandstone, and known as the *Clarence River Coal Measures.* The coal seams of the Clarence River do not possess much economic value, although the coal bearing formations of Queensland are of the same age—viz., Triassic.

As far as is known, rocks of *Jurassic* age occur in only one locality in New South Wales—viz., about 20 miles north of Gulgong. They consist of a small deposit of yellowish shales believed to be of lacustrine origin, and to have been desposited in a denuded hollow in the Hawkesbury sandstone.

The *Cretaceous* formation is of great economic importance, as from it was derived the first artesian water struck in the colony. The *Lower Cretaceous* rocks are developed in the north-west, and occupy the greater part of the basin of the Upper Darling and its tributaries, and throughout a considerable area overlie the Triassic water-bearing formation. They

have yielded in the past and continue to yield abundant supplies of artesian water, which is now largely availed of by the squatters for stock purposes, the total yield from these bores being upwards of 60 million gallons daily. Previous to 1894 it was supposed that artesian water would only be found in the Cretaceous formation, but an examination of fossils from the strata pierced by the Coonamble, Salisbury Plains, and Moree bores has proved that rocks of Triassic age in New South Wales are also water-bearing, and it is now believed that they are in fact the real source of our artesian water supplies. The eastern outcrop of the Triassic rocks of Queensland crosses into New South Wales a few miles west of the township of Texas (on the border, and about 70 miles directly west of the Wallangarra), and trend south-west towards Dubbo. Along this course the outcrop "occupies more or less high altitudes, and is fed in places by heavy rainfalls, *which are the source of the artesian water supply*. The dip of these rocks is westerly, and it appears, therefore, that they must underlie the Cretaceous rocks for a considerable distance under the north-western plains, if indeed they do not extend continuously to Leigh's Creek in South Australia, where they are known to exist, and where they contain very thick deposits of coal."

In the *Upper Cretaceous* formation occur the rich deposits of precious opal, now worked at White Cliffs, in the Wilcannia district.

Tertiary rocks (not, however, of marine origin) cover about one-third of the whole area of New South Wales, embracing the valleys of the great western rivers and their tributaries. One great break occurs in this formation, viz., in the Great Plains, where a broad belt of Silurian rocks extends westwards between the Bogan River and the Barrier Ranges. These Tertiary formations are of the highest economic importance, for they have yielded and continue to yield our chief supplies of alluvial gold, stream tin, and gems. During the middle and later Tertiary periods this portion of the world experienced abnormally heavy rainfall, as is evidenced by the great width of many old river channels, and, as a consequence, the older rocks were subjected to a correspondingly great amount of denudation. As a result the gold and tin which they contained were carried down by the action of running water, and concentrated in Tertiary leads, whence they are obtained at the present time. During the *Pliocene* period great volcanic activity prevailed, and "many of the watercourses, together with the plants and animals that lived upon their banks, were overwhelmed by streams of lava. Examples of these deep leads (which are in truth fossil river-beds) occur at Gulgong, Vegetable Creek, and Kiandra. Well-preserved relics of this life-period are brought to life from these buried river-beds, or 'deep leads,' as they are called by the gold miners." In Post-Tertiary times the present surface drainage channels were formed. These streams have during recent and Pleistocene times covered up the Tertiary and Carboniferous formations of western New South Wales with deep alluvial deposits which now form the surface of the Great Plains. During Post-Tertiary times also the rivers cut through many of the deep leads above referred to, and carrying away their metallic treasures, have transported them to more accessible positions where they are worked at the present time. The *Pleistocene* period is represented by extensive gravel beds and the wide-spreading plains of deep alluvium met with in Riverina and other portions of the western plains. During the Pleistocene period enormous animals such as the *diprotodon* (a giant of the

marsupial order, and as big as a rhinoceros or hippopotamus), the *thylacoleo* (a marsupial lion), the *thylacinus* (a pouched hyæna), &c., roamed the forests of this colony, and their bones are now found in alluvial drifts in several localities, and in many of the limestone caves.

CLIMATE.

New South Wales lies altogether within the south temperate zone, and its mean annual temperature is 59·5 degrees, or only one degree hotter than that of Paris. The mean summer temperature only reaches 68 degrees, and that of winter 44 degrees, "a range approximating closely to that of the famous health resorts of the south of France." Speaking broadly, the climate of this colony may be described as similar to that of Southern Europe. It varies, of course, according to latitude and elevation; but, on the whole, it is warm and dry. In the northern portion of the coast district the climate is hot, and, at times, disagreeably muggy in summer, but agreeably warm in winter. Notwithstanding this occasionally oppressive mugginess, the district is singularly free from the epidemics and pestilences which are usually met with in hot countries. On the tablelands it is delightfully cool and dry in summer, while in winter it is cold. On the Kosciusko Plateau snow lies on the hill-slopes from March to December. On the interior plains the winter climate is dry, refreshing, and enjoyable; it is hotter in summer and colder in winter in this region than in places of corresponding latitude on the coast, and, despite the very great heat prevailing there in the middle of summer, when the thermometer very frequently registers over 100 degrees in the shade, the climate is not by any means oppressive, as the air is not laden with that moisture which, on the sea coast, would render a less degree of heat almost unbearable. The average rainfall on the coast varies from 72 inches at the Tweed Heads to 36 inches at Eden. On the tablelands it is 30 inches, and on the western plains only 17 inches. As far as mean annual temperature is concerned, towns in New South Wales may be placed alongside European towns as follows:—Kiandra and Edinburgh; Cooma and Plymouth; Bombala and London; Tenterfield and Madrid; Dubbo and Rome; Sydney and Toulon; Bathurst and Bordeaux.

The prevailing winds are from north and west. As a general rule, along the coast northwards from Sydney, north-easterly winds prevail during the day from October to March. These "north-easters," as a rule, commence to blow between 8 and 10 a.m., and continue all day, attaining their greatest

intensity about 4 p.m., and die away about sunset. Occasionally they blow till 10 or 11 o'clock at night, and at times for several days continuously. Such winds are known as "black north-easters."

During the hottest portion of the summer—from November to the end of February—the coast district is visited by "southerly bursters" (the "brickfielders" of the early colonists), which blow at times with hurricane force, but are always welcomed as a relief after the oppressive heat which always precedes them. The winds which blow from the north and north-west are dry winds—warm in summer and cold in winter. Easterly and north-easterly winds are, as a rule, mild and humid; while those from the south and south-east are often accompanied by rainstorms.

INDIGENOUS VEGETATION.

The indigenous vegetation of New South Wales is sombre and monotonous; the trees are evergreen, and the changes of the seasons have but little influence upon "the unvaried mantle of olive-green" which clothes the Australian forest. If it cannot be said that the flora of the country is picturesque, it is certainly admitted to be in the highest degree useful. It comprises the *Acacias*, or wattle family, of which upwards of a hundred varieties are known to exist; the *Eucalyptus*, or gum-tree family, which abounds in all parts of the country; the *Casuarina*, or she-oak family; the *Banksia*, or honeysuckle family; and several species of the *Fig* tribe. In addition to these there are the *Cabbage-tree Palm*, the *Gigantic Stinging Nettle*, and the beautiful *Tree Ferns*, to whose fine branching fronds much of the wild beauty of the mountain gullies and secluded glens of the coast is mainly due.

The timbers of New South Wales comprise hard wood, soft wood, and pine wood. The chief hard woods are the *iron-bark* (used for making bridges and wharves, and noted for its great strength and durability); the *blue gum* (thicker in trunk than most gums, being sometimes seven feet in diameter); *spotted gum* (used in ship building); *stringy-bark* (a useful wood, and bark well suited for roofing); *blood-wood* (used for fencing purposes, and for railway sleepers); *tallow-wood* (easily worked, and used for flooring and ship building); and *turpentine* (used for piling and other work in sea-water, as it resists the attacks of the teredo better than any other New South Wales timber). On the alluvial

flats of the north coast rivers the *cedar* grows abundantly, and is extensively used for the finer kinds of joiners' work, and in the manufacture of furniture. Besides cedar, the chief softwoods are *rosewood*, *white maple*, *myall*, and *marblewood*. Some of the soft woods are grained and marked most beautifully, and, being capable of the highest polish, are adapted for the finest cabinet-making work. The consumption of wattle bark for tanning purposes is very great, and steps have been taken by the Government to prevent the indiscriminate stripping of the bark, and the consequent destruction of the trees. On parts of the interior plains, chiefly in the Riverina district and the region beyond the Darling, the *saltbush* shrub, noted for its nutritive and drought-resisting properties, furnishes a valuable food for cattle and sheep during periods of drought. The *mallee scrub*, consisting of a species of stunted Eucalyptus, grows in clumps mostly near the margins of many of the western rivers. As a rule, the trees in the coastal region (especially along the northern rivers) attain a greater height and girth, and yield better timber than those of the tablelands or the plains. Trees found along the tablelands are generally of stunted growth, their trunks are crooked and the wood inferior. The trees of the plains have little commercial value, their sole use being for fencing and rough building work. In order to put a stop to the indiscriminate cutting down and destruction of the best native trees, as well as to provide for re-foresting Crown reserves with the best classes of timber, the Government has established a Forest Conservation Branch whose operations have been attended with successful results. In connection with this department a State Forest Nursery has also been established at Gosford, where the acclimatisation of valuable foreign timber trees and the conservation of such of the best indigenous species as might otherwise be likely to disappear are attended to. This nursery also distributes young trees among settlers in the interior, and supplies them to municipalities, the trustees of public reserves, and persons interested in the improvement of "church and school lands."

New South Wales possesses no indigenous fruits of any value; but the coastal districts during springtime are covered with native flowers of great variety and beauty, chief among which are the *waratah*, *flannel flower*, *Christmas bush*, and *rock lily*. The beauty and fragrance of the *yellow wattle flower* furnish one of the most pleasing features of the scenery of New South Wales generally.

HAULING CEDAR TO PORT, RICHMOND RIVER.

THE NATIVE FAUNA.

The LARGER NATIVE ANIMALS comprise the *kangaroo*, *wallaby*, *opossum*, *dingo* or *native dog*, *native cat*, *native bear* (koala), *echidna*, *flying-fox*, *wombat*, and *duck-billed platypus*. Most of these are more destructive than useful. The BIRDS include several species of *parrots*, *parrakeets*, and *cockatoos*, the *brush turkey*, *emu*, *lyre-bird*, *bower-bird*, *native companion*, *black swan*, *pheasant*, *laughing jackass*, *magpie*, *wedge-tailed eagle*, *white-bellied sea-eagle*, and several varieties of *pigeons*, *hawks*, *kites*, *owls*, *ibises*, *bustards*, *spoonbills*, *bitterns*, &c. Of FISHES, some 60 different families, comprising 348 species, are found in New South Wales waters. Of edible fishes, comprising 105 different species, the chief are the *schnapper*, *rock-cod*, *salmon*, *flathead*, *whiting*, *jewfish*, *mullet*, *mackerel*, *garfish*, and *Murray cod*. Immense shoals of *herrings* visit the coasts in winter, but no attempt appears to be made to take and preserve them. New South Wales oysters are of excellent quality, and in great request throughout Australia. The chief metropolitan supplies come from the Manning River beds. Among destructive fishes the most noteworthy is the shark family. The insect fauna comprises *beetles*, *butterflies*, *cicadæ* (erroneously called *locusts*), *sandflies*, *spiders*, &c. ; while reptiles are represented by *lizards* (many of which are beautifully marked and of very great size), *fresh-water turtles* and *snakes*, among which the *black snake*, *brown snake*, *tiger snake*, and *death adder* are venomous.

Most of the domestic animals of Europe have been introduced into the colony, and are found to thrive in their new home. Another European animal—the rabbit—has increased enormously, and has for years been a terrible pest to the squatters.

THE ABORIGINES.

Ethnologists were once considerably at variance as to the origin of the Australian aborigines. As a result mainly of the careful study of the different native dialects, and of the discovery that several words in common use among the Australian blacks bear a strong resemblance to those in use over a very wide area of the globe, the opinion is now pretty generally held that the aborigines of this continent are clearly connected with the rest of the human family, that they are of Dravidian descent, and that their primeval home was Babylonia. From this region, where mankind seems to have first begun to congregate in great

Kerry, Sydney

AUSTRALIAN BIRDS.

numbers, the successive migrations were probably these—"first into the valley of the Ganges, where they were the original inhabitants, then into the Dekkan and into Further India, then into Ceylon, the Andaman Islands, and the Sunda Islands, and thence into Australia."* Whatever the origin of the aborigines may have been—and there is no tradition among them accounting for their presence in Australia—it must be confessed that their contact with the white settlers has resulted in their social and moral degeneration. Their numbers are fast diminishing—indeed in Tasmania the race has become extinct—and it is abundantly apparent that, as the outlying parts of the continent become occupied by the flocks and herds of the white man, the last remnant of the race will gradually but surely disappear from the face of the earth for ever.

At the census of 1891 the aboriginal population of N. S. Wales —including full-bloods and half-castes—numbered about 8000. Many are employed as station hands in the interior, but the great majority of them are distributed throughout the country at "settlements" controlled by the "Aborigines Protection Board," appointed by the Government. At these places they are provided with shelter and rations and facilities for carrying on fishing and a little agriculture. The physical appearance of the aborigines has been thus described :—

"The men are tall and well formed, having broad foreheads, wide mouths, small piercing eyes, flattened noses, thick black hair, deep chests, their lower limbs being thin and ill-developed as compared with those of average Europeans. They are remarkable for the beauty and strength of their teeth, for the boldness of their carriage, and for the comparative smallness of their hands and feet. Although perfectly black, they are different in appearance from the natives of Africa, wanting the woolly hair and the great thickness of lips for which the latter are noted. The women are smaller than the men, in appearance worse looking, and with frames not so well developed."

Their weapons of warfare and the chase are of a rude and primitive type. They consist mainly of the *boomerang*, *spear*, and *nulla nulla*, and in the use of these the blackfellow displays considerable skill. The boomerang, when thrown by a skilful native huntsman, hits its mark with deadly aim. It can also be thrown so as to describe a series of curves through the air, ending its flight at last near the feet of the thrower. The spears are hurled by means of a throwing stick called a *wommera*, and are formidable weapons of attack at a range of often 100 yards. Some of the more intelligent

* *Vide* Dr. Fraser's *An Australian Language*, &c., pp. lviii. to lxiv., G.P. 1892.

Copyright Photo. A CORROBBOREE. Kerry, Sydney

tribes appear to have made use of a species of picture writing for the purpose of giving permanent expression to their ideas, and rude representations of men, birds, land-animals, and fish have been found throughout the continent, very often on broad, flat-topped rocks, and sometimes in the cave-shelters frequented by them The language of the blacks is soft and somewhat melodious. It consists of a great number of dialects, differing from one another considerably, so much so, that tribes inhabiting districts no great distance from one another are often almost unable to understand one another's speech. It has been shown, however, that the root forms of the words in common daily use are the same all over the continent The dwelling places, or gunyahs, are of a most primitive description, being constructed of a few sheets of bark and the boughs of trees rudely fastened together, except on the north coast, where they are of a far more elaborate character. Among their amusements the foremost is the *corrobboree*, a rude form of drama, which aims at representing some phase of aboriginal life. For the most part the men are the performers and the women the musicians. The following description of one in which a Queensland black, named Eaglehawk or King Billy, was the leading performer, has been given by Mr. G. S. Lang :—

"There were over 500 natives in the assemblage. The stage consisted of an open glade surrounded by a belt of rather thick timber, about 200 yards in length and breadth, narrowing towards the south end, across which sat the orchestra, consisting of nearly a hundred women, led by Eaglehawk himself. The leader chanted a description of scenes as they passed, accompanied by the women, their voices continuously repeating what seemed to be the same words, while they beat time by striking with a stick a quantity of earth, tightly rolled up in a piece of cloth or opossum rug. The moon shone brightly, lighting up the stage and tops of the trees, but casting a deep shadow below. This shadow, however, was again relieved by several large fires on each side of the stage, leaving a clear view of Eaglehawk and the orchestra, behind whom stood the spectators, the whites being in the centre. The first act of the corrobboree was the representation of a herd of cattle, feeding out of the forest and camping on the plain, the black performers being painted accordingly. The imitation was most skilful, the action and attitude of every individual of the entire herd being ludicrously exact. Some lay down and chewed the cud, others stood scratching themselves with their hind feet or horns, licking themselves or their calves ; several continued rubbing their heads against each other. This having lasted some time, scene the second commenced. A party of blacks was seen creeping towards the cattle, taking all the usual precautions, such as keeping to windward, in order to prevent the herd from being alarmed. They got up close to the cattle at last and speared two head, to the immense delight of the black spectators. Scene the third commenced with the sound of horses galloping through the timber, followed by the

appearance of a party of whites on horseback, remarkably well got up. The face was painted whitey-brown, with an imitation of the cabbage-tree hat; the bodies were painted, some blue and others red, to represent the shirts; below the waist was a resemblance of the moleskin trousers. These manufactured whites at once wheeled to the right, fired, and drove the blacks before them; the latter soon rallied, however, and a desperate fight ensued, the blacks extending their flanks and driving back the whites. The native spectators groaned whenever a blackfellow fell, but cheered lustily when a white bit the dust, and at length, after the ground had been fought over and over again, the whites were ignominiously driven from the field, amidst the frantic delight of the natives."

MINES AND MINERALS.

New South Wales is the richest of the Australian colonies in mineral wealth, and it was owing to the discovery of its valuable gold fields in 1851 that the importance and possible future greatness of Australia were first brought prominently before the nations of the world. Gold, silver, copper, tin, iron, and many other metals are found in abundance, while the coal fields of the colony are both extensive and productive. New South Wales, it may be remarked, possesses in the gold mine at Lucknow, near Orange, the silver mines at Broken Hill, and the Cobar copper fields some of the richest deposits of their kind in the world; while at the White Cliffs mine, in the Wilcannia district, occurs some of the finest opal ever discovered.

Gold-mining as an industry dates from Hargraves' discoveries at the Summer Hill and Lewis Ponds Creeks, in the Bathurst district, in 1851. The existence of gold in the colony, however, was known much earlier. As far back as 1823 a surveyor named McBrian discovered gold-bearing sand in the hills between Tarana and O'Connell during his survey of the Fish River. In 1839 Count Strzelecki found auriferous pyrites, and in 1841 the Rev. W. B. Clarke discovered gold in the granite formation between Hartley and Hassan's Walls and at the head of the Winburndale Rivulet. He showed a sample to Sir George Gipps, but the latter, fearing the effect that proclamation of the discovery might have upon the convicts and colonists, said: "Put it away, Mr. Clarke, or we shall all have our throats cut." The chief places in the colony where gold-mining is at present carried on are:—Lucknow, Wyalong, Adelong, Araluen and Braidwood, Clarence district, Cobar, Drake, Gundagai, Parkes district, Peak Hill, Mudgee and Hill End districts, Temora, Pambula, Mount Browne, and Broken Hill. The annual yield of the Lucknow mine exceeds 36,000 ounces, while for the year 1897 the total yield of the different mines at Wyalong exceeded 32,000 ounces. Daviesville (formerly Mitchell's Creek) near Wellington, is at the present time the best paying gold mine in New South Wales. In addition to batteries, most of the large goldfields now possess extensive chlorinating and cyanide works, while the elaborate smelting works at Lake Illawarra and Cockle Creek (near Newcastle) have given a marked impetus to the industry generally.

Silver.—The great bulk of the silver is obtained from Broken Hill, where the metal was first discovered in 1883 by a boundary rider on the Mount Gipps Run. This field is now the principal silver-producing centre in the world. The ore deposits occur in lodes (of the type known as "Saddle reefs") traversing rocks of Silurian age. Copper, lead,

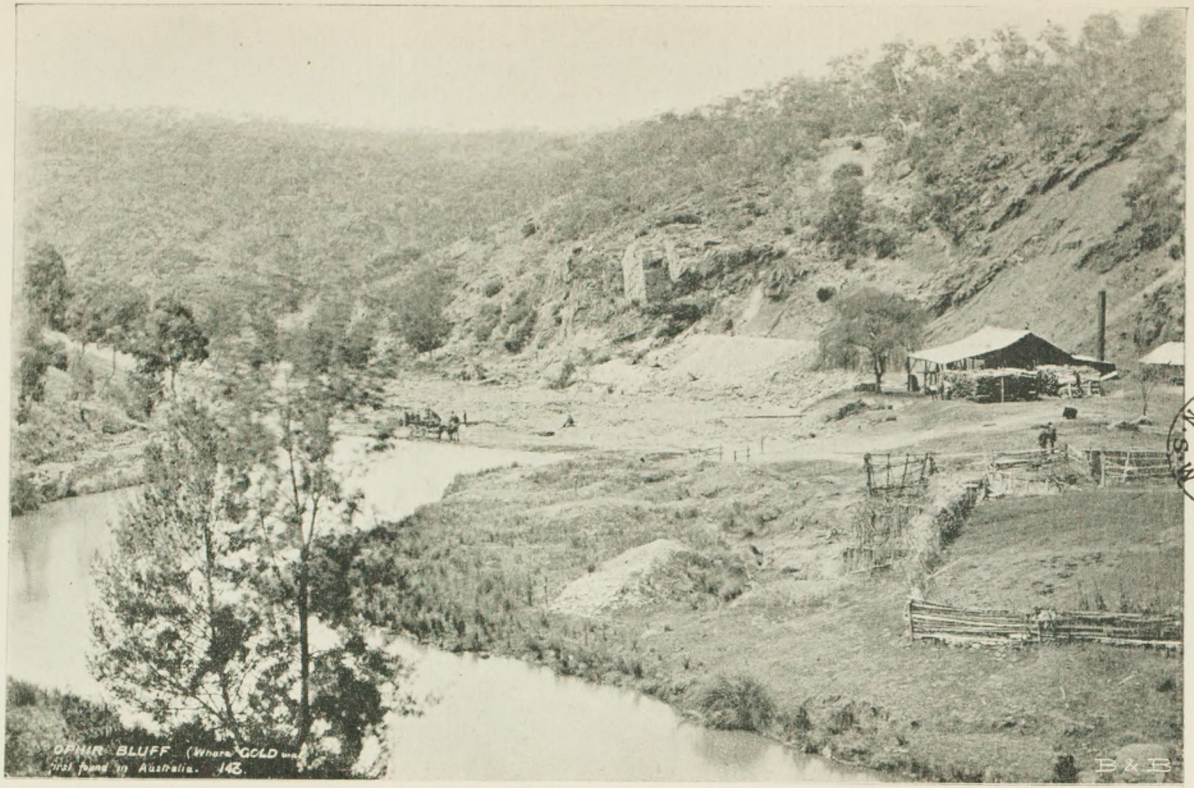
and gold also occur in the field, and the yearly value of the mineral output of the district exceeds three millions sterling. The mines of the Barrier region are situated not only at Broken Hill, but also at Silverton and Thackaringa. Other silver-producing districts are Captain's Flat, White Rock (near Drake), and some other places on the New England tableland. The silver ore at Captain's Flat contains gold, copper, and lead, the last-named in considerable quantities.

Tin.—Although the Rev. W. B. Clarke drew attention to the existence of tin in the colony as far back as 1853 no attempt was made to work our tin fields till 1872. From that date to the end of 1896 the total value of the tin exported exceeded ten millions sterling. The industry is at present confined solely to the northern tableland, the chief tin-producing centres being Tingha, Inverell, Glen Innes, Deepwater, Wilson's Downfall, and the upper valley of the Macleay. Nearly all the tin raised is *stream tin*, derived from the Tertiary and Quaternary drifts where these are composed of detritus from stanniferous granite. The tin-bearing deposits of the colony are estimated to cover 5½ million acres.

Copper.—The chief deposits of copper are found in the districts lying between the Macquarie, Bogan, and Darling Rivers The Great Cobar mine is the largest in New South Wales, and in 1896 yielded smelted copper to the value of £107,000. This metal is also obtained at Nymagee, Mt. Hope, Captain's Flat, Sunny Corner, the Blayney district, and in the Abercrombie Ranges. The Broken Hill Proprietary Company save in connection with their silver-mining operations copper to the value of nearly £30,000 annually. Up to the end of 1896 copper to the value of seven million pounds sterling has been exported.

Iron.—Iron is widely distributed throughout New South Wales, and although its existence has been proved at Wallerawang, Lithgow, Mittagong, Newbridge. Picton, Berrima, Goulburn, Illawarra, in the Rylstone and Mudgee districts, and at Port Stephens, very little has as yet been done towards developing this important source of natural wealth. The value of these deposits is greatly enhanced by their invariable proximity to beds of coal and limestone, and the districts indicated are traversed by railway lines. The Fitzroy works at Mittagong have been shut down for some years past, and at present the only iron works in the colony are at Eskbank, in the Lithgow Valley, consisting of foundry, forge, and rolling mills. Most of the plant at Eskbank was made on the ground, where fortunately iron ore, coal, fireclay and moulder's sand are present in abundance. During 1896 the finished iron manufactured at these works from scrap iron alone was valued at over £33,000. The iron ore deposits of the Mittagong and Berrima districts consist of brown hæmatite, limonite, and bog iron ore. These ores appear to have been formed from ferruginous springs, some of which are still flowing in the vicinity and depositing hydrous oxide of iron on the surface. The late Government Geologist has estimated the quantity of ore in sight in this district to be about 2,870,000 tons, yielding on analysis nearly 50 per cent. of metallic iron. Chromic iron deposits have been found in large quantities at Gundagai, Nundle, and Bingara.

Antimony.—The chief seat of the antimony industry is at Hillgrove, near Armidale, where the ore is also worked for gold. Antimony ore is also found in the Gulgong, Rylstone, Bellinger, and Macleay districts. The ore consists mostly of sulphide of antimony (stibnite), but oxide of antimony occurs as well.



OPHIR BLUFF—SUMMER HILL CREEK. (Where Hargraves discovered gold in 1851.)

Bismuth ores have been worked at Kingsgate near Glen Innes, and are known to occur at Pambula, Nymagee, Broken Hill, and Mount Gipps. On account of the small demand for bismuth the deposits are only worked on a limited scale, and during 1896 only 40 tons were exported.

Platinum is produced at Fifield, in the Parkes district, where nearly 3000 ozs. were raised in 1896. The metal has also been discovered in the lodes at Broken Hill.

Mercury, in the form of cinnabar, has been obtained in the Cudgegong River, near Rylstone, and at Bingara, Solferino, Drake, and Cooma, but none of these deposits have been extensively worked.

Marble deposits exist in the Marulan, Orange, Bathurst, Tamworth, Moonbi, Newbridge, and Mudgee districts.

Alum stone, yielding about 80 per cent. of alum, occurs as an immense deposit at Bulladelah, 35 miles from Port Stephens. The produce of this field is sent to England for treatment, about 1500 tons being exported annually.

Opal.—Some of the best precious opal in the world is obtained at the White Cliffs about 60 miles N.N.W. of Wilcannia, where it was accidentally discovered by a kangaroo hunter in 1889. The opal, some of which was valued at as much as £18 per oz , occurs in small pipes in a soft white rock (locally known as "Angel Rock"). About 500 men are employed on the field, and the value of the output for 1896 was about £25,000. Opal is also found at Rocky Bridge Creek, near Trunkey.

Diamonds are plentiful at Bingara and Inverell, in alluvial drifts, but they are small and for the most part faulty in colour. They have also been found at Two Mile Flat, near Mudgee. Some of the largest and clearest forms of *topaz* in the world have been found in the New England district, while *sapphires* are found in the Emmaville and Tingha districts. In the drifts of the Wingecarribee River, near Berrima, the *sapphire*, *emerald*, *amethyst*, and *turquoise* have been found *in situ*. Gems, including the *diamond*, *sapphire*, *emerald*, *amethyst*, *turquoise*, *garnet*, *zircon*, &c., have been met with in the gold and tin bearing drifts throughout the colony.

Infusorial Earth occurs near Barraba, Lismore, Cooma, and the Warrumbungle Mountains, and will no doubt be of value in the future for the manufacture of dynamite and polishing powder. At present it is only worked at Wyrallah, in the Lismore district, where about 700 bushels were raised in 1896. *Kaolin* of excellent quality (and said to be superior to the best obtained in England or France) occurs at Tichborne, near Parkes; while *yellow ochre* and other *pigment deposits* are met with near Dubbo and Mudgee, as well as in the Orange district.

Granite occurs extensively through the colony, and excellent blocks have been quarried at Moruya ; *trachyte** is obtained at Bowral ; and *basalt* or blue metal (used for road metalling and ballasting of the railway lines) at Kiama, Prospect, Pennant Hills, Bathurst, Orange, Dubbo, and Bowral ; while *building stone* of excellent quality is furnished by the Hawkesbury Sandstone formation on which Sydney stands.

Coal.—The coal fields of New South Wales form one of the great factors of its national wealth, and occupy an area of at least 25,000 square miles, while

*The so-called "trachyte" of Bowral is in reality a rock composed of glassy felspar and hornblende, and should, therefore, be classed as a *syenite*.

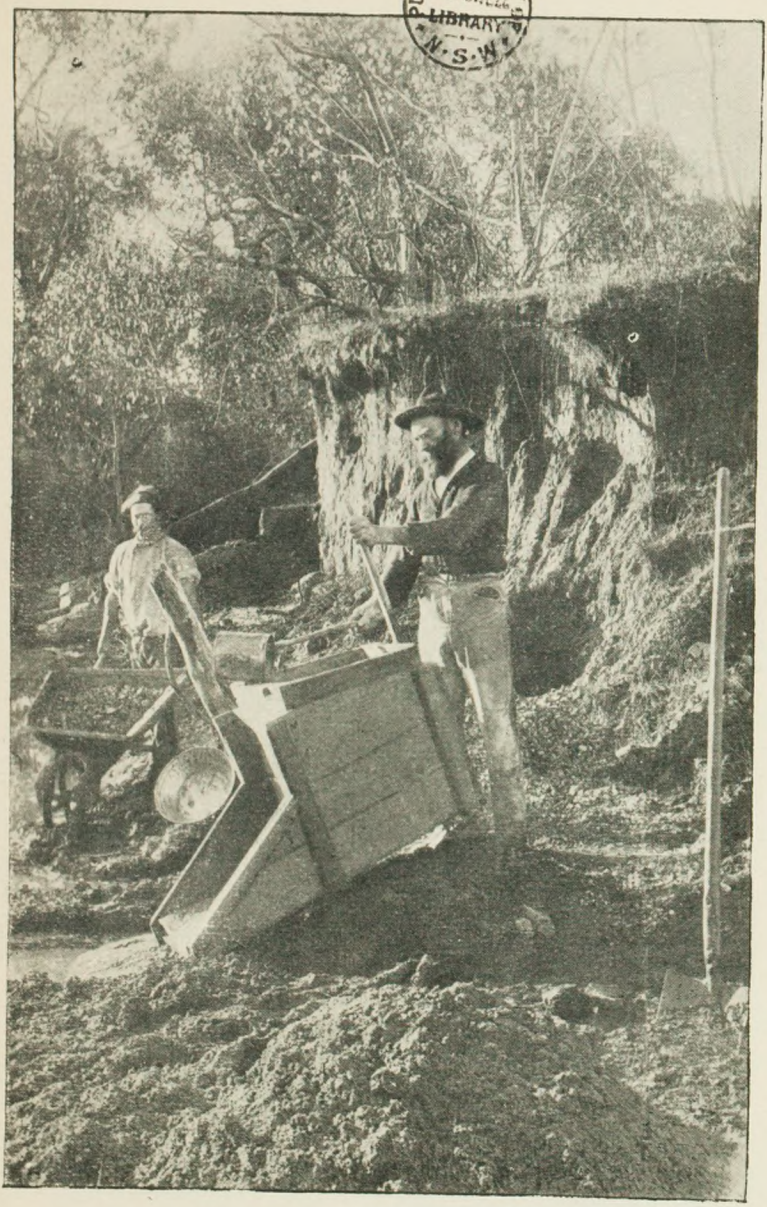


Photo by Rev. J. Milne Curran.

GOLD CRADLING AT TUMBERUMBA.

their working gives employment to over 10,000 men. Coal was first discovered in the colony in 1797 at Mount Keira, near Wollongong, by a man named Clark, supercargo of the *Sydney Cove*, while on his way to Sydney overland along the coast after the wreck of his vessel in Bass Strait. Later in the same year coal was also discovered at the mouth of the Hunter by Lieutenant Shortland. This seam was worked under Government control by convict labour, until in 1826 the Australian Agricultural Company obtained a grant of a million acres of land, together with the sole right conferred by charter of working the coal seams which were then known to exist in the Newcastle district. As a result of this grant several mines were opened and profitably worked for several years, but it was not until the termination of the monopoly in 1847 that the coal-mining industry began to be extensively developed. There are at present about 100 collieries at work in the colony, and the chief coal fields are five in number: (1) the *Hunter River* or *Newcastle*; (2) the *Southern* or *Illawarra*; (3) the *Western* or *Lithgow*; (4) the *South-Western* or *Mittagong*; and (5) the *Namoi* or *Gunnedah*. Coal is also worked at Berrima and Bundanoon, on the Great Southern Railway Line, between Lithgow and Mudgee, and in the Clarence River district. The Clarence River coal field (which, like the Ipswich coal measures in Queensland, is of mesozoic age) is not worked very extensively owing to the presence throughout the seam of numerous partings and clay bands. Sydney occupies an almost central position with regard to the coal-mining districts, and the existence of a coal seam beneath it has been proved by bores put down to nearly 3000 feet at Cremorne Point, on the northern shores of the harbour. Already the "Sydney Collieries Company" has secured the right to mine for coal under Sydney Harbour, and is engaged in sinking two enormous shafts at Balmain, where, it is stated, facilities will be afforded for shipping coal to the largest vessels afloat. The seams of coal at present worked occur in the *Upper Coal Measures* (*e.g.*, Newcastle series), *Middle Coal Measures* (*e.g.*, East Maitland or Tomago series), and *Lower Coal Measures* (*e.g.*, the Greta series). The Greta seam yields excellent "gas-coal," and in the vicinity of West Maitland attains a thickness of 30 feet. From 1858 to 1896, 70 million tons of coal, valued at over 30 million pounds sterling, were raised in New South Wales.

Kerosene Shale.—Joadja Creek and Hartley are the chief seats of the kerosene shale mining industry, and the seam at the latter place attains a thickness of five feet. Kerosene shale also occurs near Gulgong, Capertee, Katoomba, and Murrurundi. During the 30 years preceding 1896 the total output was about 900,000 tons. The kerosene shale deposits occur in the Coal Measures.

INDUSTRIES.

The chief industries of New South Wales are pastoral pursuits, mining, agriculture, dairy-farming, and fruit-growing. The pastoral industry is confined chiefly to the tablelands and the western plains, and affords employment to over 30,000 persons. More than 121,000 people are engaged in agriculture, dairy-farming, and cognate occupations, nearly 40,000 follow the mining

industry, while about 50,000 find employment in connection with manufactures of different kinds.

The colony contains about fifty million sheep, nearly two and a quarter million cattle, and over half a million horses.

Dairy-farming is confined mainly to the coast districts and tablelands; and the number of central butter factories, fed by separating establishments, called "creameries," is rapidly increasing. The chief factories are situated in the Eden, Shoalhaven, Kiama, Camden, Mudgee, Hastings, Manning, Clarence, Richmond, and Tweed River districts. Every year New South Wales manufactures between twenty-five and thirty million pounds of butter, and between four and five million pounds of cheese. The creamery and butter factory systems have proved highly economical, and their introduction has completely revolutionised the dairying industry in the colony. They have done away with much of the drudgery and imperfect processes formerly met with in dairy-farming, and resulted in the production of an article of uniformly high quality that meets with a ready sale in the British market.

The value of minerals raised annually in the colony (and comprising chiefly gold, silver, copper, tin, and coal) is over £110,000,000, about one-third of which is represented by coal alone, and about one-fifth by gold.

More than one-fourth of the adult male population are engaged in agriculture, and the value of the produce grown annually is about £5,300,000. The chief crops raised are wheat, maize, barley, oats, hay, potatoes, and grapes; in addition to which sugarcane is largely grown on the North Coast rivers. The vine is profitably grown in the Hunter, Mudgee, and Murray districts.

The importance of agriculture is recognised by the Government, and under the superintendence of the Department of Agriculture a splendidly-equipped college has been established at Ham Common, near Richmond, for providing instruction in scientific agriculture; while Government experimental farms have been established in every distinct climatic region in the colony—*e.g.*, at Wagga, Lismore, Bathurst, and in the vicinity of the larger artesian bores of the interior.

The manufactures of the colony are of a varied character. They comprise:—(i.) *Works connected with the preparation of food products—e.g.*, sugar mills and refineries, flour mills, meat-preserving works, breweries, butter, cheese, bacon, biscuit, and jam factories, &c.; (ii.) *clothing and textile fabric factories—e.g.*,

boots and shoes and clothing factories, &c.; (iii.) *metal works—e.g.*, engineering and boiler-making works, iron foundries, agricultural implements and smelting works, &c.; (iv.) *works connected with the supply and preparation of building materials—e.g.*, potteries, joinery and brick works, stone-crushing and asphalting works, lime and marble works, &c.; (v.) *shipbuilding and repairing works and docks*; (vi.) *coachmaking and saddlery works*; (vii.) *printing and bookbinding establishments and paper mills*; (viii.) *furniture works*; (ix.) *miscellaneous works employing only a few hands each.*

ARTESIAN WELLS.

Artesian boring in New South Wales is an enterprise of recent date. It was begun by Mr. David Brown, a squatter, who in 1879 completed a successful bore on the Killara Station, near Bourke. The example thus set was soon followed by others, and up to 1896 over 100 artesian wells were sunk by private enterprise in the plains of the west, with a combined flow of at least forty million gallons of water daily. By means of the water thus obtained many outlying stations hitherto dependent on a scanty rainfall and the precarious supply furnished by tanks and dams "are provided with a copious and permanent flow, which gives such properties an increase in value that cannot be estimated." Since 1884 the Government has undertaken the sinking of a great number of artesian wells for the purpose of (i.) providing an adequate water supply for sheep and cattle along the drought-stricken stock routes of the interior, and (ii.) furnishing geological evidence of the limits and extent of the artesian water-bearing formations. As a result it has been proved not only that the whole of the Cretaceous formation in the north-western portion of the colony may be expected to yield an abundant supply of artesian water, but also that the Triassic rocks, in which successful artesian bores have been sunk at Coonamble and Moree, are water-bearing. Indeed, the leading geologists of the colony now hold that the Triassic formation, which underlies the Cretaceous rocks over wide areas, is the true source of all artesian water in western New South Wales.

Not only have the artesian wells been instrumental in saving thousands of sheep and cattle during dry seasons, but, by furnishing water along the stock routes, they facilitate the carriage of wool and other station products to the railway centres of the interior for despatch to the metropolis to be thence sent abroad. They

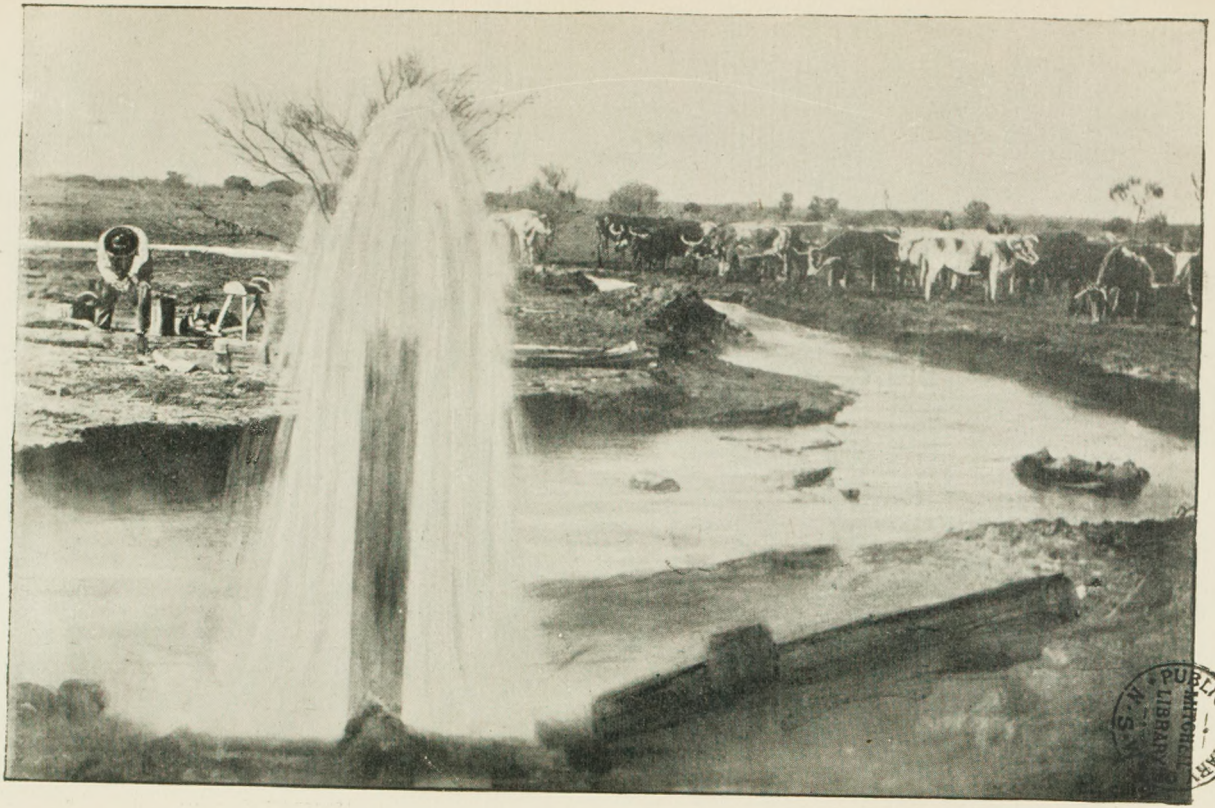


Photo. by Rev. J. Milne Curran.

ARTESIAN BORE—WESTERN NEW SOUTH WALES.

have contributed in a large degree also to the promotion of permanent settlement in many arid parts of the western plains.

That these waters are not only suitable for stock purposes, but also for the encouragement of plant life, is abundantly shown by the results that have attended the operations of Government experimental farms at the Native Dog and Barringun Bores, where "lucerne, maize, wheat, tobacco, millet, planters' friend, sugarcane, date palms, bananas, and many other fruits and vegetables of a tropical and sub-tropical character" have been successfully grown in very unfavourable seasons.

Many of the artesian wells of New South Wales yield as much as 2,000,000 gallons of water daily; while the Euroka Bore, on the Coonamble-road, 12 miles from Walgett, has an estimated flow of 4,000,000 gallons per diem. The depth of some of the artesian bores in this colony exceeds 2000 feet, and the temperature of the water which issues from them—sometimes to the height of 50 feet—is in many cases as much as 120° Fahrenheit. The most successful bores hitherto sunk for irrigation and experimental farming purposes are the Pera and Native Dog Bores, in the Bourke district, while several others in the Bourke and Barringun districts have yielded almost equally satisfactory results.

EXPORTS.

The chief articles exported, with their annual value indicated in round numbers, are as follows: — *Wool* (nearly 300,000,000lbs., valued at about £9,000,000); *live stock* (over £600,000); *tallow* (£500,000); *leather* (£338,000); *timber*, dressed and undressed (£72,600); *coal* (£900,000); *meats and extracts* (£653,000); *skins* (£638,000); *gold* (nearly £4,000,000); *silver and lead* (£1,600,000); *tin* (£155,000); *kerosene shale* (£32,000); *fruits* (£174,000). The total value of the exports is about £23,000,000 annually.

IMPORTS.

The annual value of the imports is nearly £20,500,000. Among imported articles the chief are:— *Clothing*, *textile fabrics*, articles of *food and drink*, *machinery*, *iron and metal goods*, and *manufactured goods generally*.

POLITICAL DIVISIONS.

New South Wales is divided into 141 counties and into 13 pastoral districts. It is also divided into 125 electoral districts (11 city, 26 suburban, and 88 country), each electing one member of Parliament, and containing as far as possible the same number of electors; while for the administration of justice other sub-divisions of the colony have been made. For the controlling of Crown Lands, the colony is divided into the *Eastern*, *Central*, and *Western* Divisions, and each of these in turn is still further subdivided into land districts, presided over by local land boards. In addition to these, there are 71 police districts, made for facilitating the police administration, and for the collection of statistics.

GOVERNMENT.

New South Wales is a British colony enjoying responsible government.

The control of public affairs is vested in the *Governor*, who represents the Sovereign, and a *Parliament* consisting of two Houses—a *Legislative Council* and a *Legislative Assembly*. The Governor is appointed by the Crown on the recommendation of the Secretary of State for the Colonies, and holds office during the pleasure of the Crown, but usually for the term of six years. He is nominal head of the Executive, and being an Imperial officer safeguards, by his advice and powers of veto and reservation, the interests of the Empire at large. His salary, which is charged on the consolidated revenue of the colony, is at present fixed at £7000 per year. In the event of the Governor's death, incapacity, or prolonged absence from the colony the duties of his office are carried out by the Lieutenant-Governor (who is usually the Chief Justice). Members of the Legislative Council are nominally appointed by the Governor (*really* by the Executive) and, subject to certain limitations, hold their seats for life. There are 125 members in the Assembly. They are elected on a manhood suffrage basis, and receive each an annual allowance of £300 Subject to certain disqualifications every male person above the age of 21 years, who is a British subject, a resident in the colony for one year and of any electoral district for one month, may vote for the election of members of Parliament. The maximum duration of any parliament is three years. The concurrence

of each House is necessary to legislation, and technically each possesses co-ordinate powers. Any measure may originate in either branch of the legislature, with the exception that bills imposing financial burdens on the community must originate in the Assembly, while bills dealing with the constitution of either House should originate in that House only. For purposes of administration the public business of the colony is distributed among nine State Departments, each of which is presided over by a Minister responsible to Parliament for the proper administration of such Department, and with the exception of one or two who are usually members of the Council, the Ministry have seats in the Assembly. These Ministers, the chief of whom is the Premier (*i.e.*, the person entrusted by the Governor with the task of forming the Ministry), are the Colonial Secretary, the Colonial Treasurer, the Attorney-General, the Secretary for Lands, the Secretary for Public Works, the Minister of Justice, the Minister of Public Instruction, the Secretary for Mines and Agriculture, and the Postmaster-General.

The actual work of administering the different State Departments is carried out by a body of trained officials known as the *Public Service*. New South Wales, like all other British colonies, has a paid representative in London, called the Agent-General, whose duties are chiefly (i.) to watch the interests of the colony; (ii.) to negotiate all matters of detail in connection with the floating of loans and the payment of interest to holders of Government stock; and (iii.) to furnish information to intending emigrants and to commercial men.

POPULATION.

The population of New South Wales in round numbers is (exclusive of the aborigines) about 1,400,000. Of these over three-quarters of a million were born in the Australian colonies, a quarter of a million came from the United Kingdom, and the remainder consist for the most part of settlers and traders from the chief countries of Europe, and about 13,000 Chinese. The aborigines number about 8000.

EDUCATION.

New South Wales possesses abundant educational facilities. An excellent system of primary education is furnished by the *Public Schools* at a merely nominal cost, and in case of poverty of the

parents the fees are altogether remitted. Attendance at school is compulsory between the ages of six and fourteen years. Besides the Public Schools, which are supported by the State, there are numerous *Denominational Schools* (chiefly Roman Catholic), which impart elementary instruction in the Sydney district and in the larger towns. The instruction in the Public Schools, though nominally secular, includes lessons on moral subjects, the duties of citizens, and the facts of Scripture history, and clergymen may visit the schools for an hour daily for the purpose of giving religious instruction to the pupils of their own denomination.

Secondary education is provided for by the *Superior Public Schools*, *Public High Schools*, *Private Colleges*, and *Grammar Schools*; while at the head of the whole educational system stands the splendidly-equipped *Sydney University*, which controls higher education, and grants degrees in *Arts*, *Science*, *Law*, *Medicine*, *Mining*, and *Engineering*.

The *Technical Education* branch of the Department of Public Instruction controls an elaborate system of technical education, which is carried on in the metropolis, and in the large centres of population throughout the country. There is hardly a town in the colony which does not possess a *School of Arts*, *Mechanics' Institute*, *Public Library*, or similar institution.

RELIGION.

There is no State Church in New South Wales, but all denominations of the Christian religion are represented in the colony. In round numbers the numerical strength of the various denominations is as follows:—*Church of England*, 503,000; *Roman Catholic*, 287,000; *Presbyterian*, 109,000; *Wesleyan*, 88,000; *Congregational*, 24,000; *Methodist*, 24,000; *Lutheran*, 8000; and *Salvation Army*, 10,500. In addition to these there are 10,000 *Buddhists*, 5500 *Hebrews*, and numerous other sects.

TOWNSHIPS.*

TOWNS OF THE COAST DISTRICT.—(*a*) IN THE COUNTY OF CUMBERLAND.

SYDNEY, the capital, stands on the southern shores of Port Jackson, and its numerous suburbs extend southerly towards Botany Bay; easterly towards "The Heads," five miles away; and in a westerly direction as far as Parramatta, distant fifteen miles by rail from the metropolis. Another series of rapidly-growing residential suburbs extends from North Sydney (on the northern shores of Port Jackson), along the Milson's Point to Hornsby railway-line. The total population of Sydney and its suburbs exceeds 410,000. The city was founded on 26th January, 1788, by Captain Phillip, and was named after Viscount Sydney, at that time Secretary of State for the Colonies. Perhaps no city in the world has fairer natural surroundings. For mile after mile its capacious harbour extends in sweeping curves round an endless succession of bays and small peninsulas, and constitutes a never-ending source of enjoyment, both to the inhabitants and to visitors. The city proper, as appears from the winding nature of many of its old streets, has grown with the colony's growth, "without much forethought, and certainly without much deliberate plan. In the old charts and views, the outline of what is now George-street, and the main artery of the city, may be traced as a winding bullock-track, starting from the vicinity of Dawes' Point (or of what was once the King's Stairs), and pursuing its sinuous way round obstacles and past certain fixed points, without any regard whatever to mathematical directness." The principal streets are lined with large warehouses and other mercantile establishments; while such buildings as the Post Office, Town Hall, churches, and hospitals, the University, Technical College, Fruit Market, and the chief public offices, all bear evidence of the enterprise and prosperity of the inhabitants. The Town Hall is one of the largest in the world, and contains the largest organ ever constructed. Sydney is a great trading port, and gives emyloyment to a large fleet of steamers and sailing vessels. It possesses 200 miles of water frontage available for shipping, while the average depth of the harbour is at least 30 feet. Vessels of the largest tonnage are thus enabled to berth alongside the wharves that have been erected both by the Government and by private owners at the Circular Quay, Miller's Point, and Darling Harbour. All the important railway lines of the colony converge upon Sydney, and swell the volume of its trade. The railway terminus for the heavy goods traffic is situated at Darling Harbour, where wool, frozen beef and mutton, tallow, coal, and other staple products of the country are shipped. Numerous manufacturing establishments are constantly at work, *e.g*, sugar refinery, engineering establishments (including the extensive Government railway workshops at Eveleigh), smelting works, coach and boot factories, tweed, flour, and paper mills, ice works, &c. Sydney possesses abundant facilities for the repair of the largest vessels afloat. The Sutherland Dock, built by the Government at Cockatoo Island, is said to be almost the largest

* For convenience of arrangement this term, properly applied to the smaller settlements, here includes cities such as Sydney, Newcastle, and Bathurst, as well as the larger provincial towns.

Copyright Photo.

GENERAL POST OFFICE, SYDNEY.

Kerry, Sydney.

graving dock in existence. It is excavated out of the solid rock, and is provided with some of the most powerful and modern appliances. It is 630 feet long and 108 feet wide and the depth of water over the sill is 32 feet at neap and 30½ feet at spring tides. The Fitzroy Dock, also at Cockatoo Island, Mort's Dock at Balmain, the Atlas and the Jubilee Docks cover many acres, and are in constant requisition. The district surrounding Sydney yields sandstone suitable for building purposes, and, as a result, the city, from an architectural point of view, bears a substantial character. Sydney is well provided with parks, chief among which is the Botanical Gardens—the most complete and the most beautifully-situated recreation grounds of their kind to be met with anywhere. The Governor's residence is situated in extensive and tastefully laid out grounds, lying immediately to the north of the Upper Gardens. Adjoining the Botanical Gardens on the southern side is the Domain, a favourite recreation ground, in which stands the National Art Gallery. The most populous suburbs of Sydney are Redfern, Balmain, Newtown, Marrickville, Leichhardt, Summer Hill, Ashfield, Burwood, Paddington, Waverley, Randwick, and North Sydney—in fact, suburban Sydney is far more populous than the city itself.

PARRAMATTA, the oldest town in the colony except the metropolis is situated on the Great Western Railway, 15 miles from Sydney, and is the centre of a flourishing fruit-growing district. Adjoining the town is an extensive park, on which stands old Government House, the residence of the early governors from the time of Captain Phillip (1788) to the end of Sir Chas. Fitzroy's term of office (1853). The town was laid out by Governor Phillip in 1790, and named by him Rose Hill. This name was afterwards changed to its present designation, which in the aboriginal language means "head of the waters." A tramway connects the town with the head of the river navigation. Parramatta possesses a large gaol, and several charitable institutions, industrial schools, and asylums. The population of the municipality is about 12,000. Within a few miles of Parramatta are *Prospect*, *Castle Hill*, *Dural*, *Galston*, *Carlingford*, and *Smithfield*. These are all flourishing townships in fruit-growing and agricultural localities, and have daily coach communication with Parramatta.

LIVERPOOL, another of the oldest towns in the colony, is situated at the head of navigation of George's River, and on the Great Southern Railway, 22 miles south of Sydney. It possesses an extensive paper manufactory, wool-washing and tanning establishments, and a large Benevolent Asylum. Population of municipality, 3450.

CAMPBELLTOWN (population of municipality, 2400), on the Great Southern Line, 34 miles from Sydney, is surrounded by agricultural and dairy-farming lands. A Government tramway, seven miles in length, which acts as a feeder to the railway, connects Campbelltown with *Camden*, a town with a population of 1550, on the Nepean, and the centre of a well-known vine-growing and dairying district. About 20 miles S.W. of Campbelltown is *Picton* (in the County of Camden), a railway town, surrounded by a dairy-farming district. It has a population of about 1000 people; and six miles to the west are the Picton Lakes, a favourite shooting-ground for sportsmen.

PENRITH, a thriving town on the Great Western Railway, near the foot of the Blue Mountains, and 34 miles west of Sydney. It is built on the east bank of the Nepean, which is here crossed by a large tubular

railway bridge, built of iron. The population of the town includes a large number of railway employees; but the surrounding district is devoted to agriculture, maize being the principal crop raised. The station yard at Penrith is the largest out of Sydney, and has extensive engineering and fitting shops for rolling-stock. The viaduct over Knapsack Gully, a few miles from Penrith, is a good specimen of railway architecture. The town possesses four tanneries, and is lighted by electricity. Population of municipality, 4680. About three miles distant from Penrith, and on the opposite bank of the Nepean, is the township of *Emu*, close to where the ascent of the Blue Mountains begins.

St. Marys, on the Great Western Railway, five miles east of Penrith, possesses numerous tanneries. The surrounding district is agricultural. Population of municipality, 1780.

Blacktown, at the junction of the Great Western and Richmond Railway lines, 22 miles west of Sydney. Grapes, oranges, and other fruits are grown largely in the surrounding district. The place takes its name from an institution founded there by Governor Macquarie for the education of the aborigines.

Riverstone, situated on the railway line midway between Blacktown and Windsor, is noted for its extensive meat works. Fruit-growing is also carried on in the neighbourhood. Population, 900.

Windsor, one of the oldest settled places in the colony, is situated on the Blacktown-Richmond railway line, 34 miles from Sydney, and at the head of navigation of the Hawkesbury. It was at one time the country seat of Governor Macquarie. The surrounding district is fertile, and is devoted mainly to agriculture, producing cereals and other farm products to perfection. The town itself is on a hill, and is not much affected by the desolating floods that occasionally sweep over the surrounding district. A large bridge, built on iron cylinders, spans the Hawkesbury at Windsor, which also has tanneries, a butter factory, benevolent asylum, and a private observatory. Population of town, 1200; of municipality, 2300. *Wilberforce* and *Pitt Town* are townships near Windsor, in the midst of rich maize-growing lands, which yield sometimes as much as 100 bushels to the acre. Near these townships the Government has established "labour settlements."

Richmond, four miles from Windsor, is the terminus of the Blacktown-Richmond railway, and "one of the most English-looking towns in the colony." It is built within a short distance of the Hawkesbury River, and the surrounding district consists of rich agricultural land, yielding large quantities of oaten and lucerne hay, and heavy crops of maize. The Kurrajong Heights, a popular tourist resort and sanatorium, are distant about 10 miles west of the town. Oranges and stone fruit are largely grown on the slopes of the Kurrajong Mountains. At Ham Common, close to Richmond, the Government has resumed 4000 acres of land, on which is erected a well-equipped Agricultural College. In connection with the college an extensive experimental farm is in operation. The municipality of Richmond has a population of 1350.

Ryde, on the north bank of the Parramatta River, eight miles north-west of Sydney, in a district celebrated for its orange and other orchards. The Great Northern Railway passes within a mile of the town-

ship, and the Ryde Bridge, over which it passes, is a substantial iron structure. Population, 3200.

North Sydney (formerly St. Leonards) is a rapidly-extending residential suburb, on the northern shores of Port Jackson, opposite the Circular Quay, with which communication is maintained by a fleet of first-class ferry steamers. A railway line to Hornsby, on the Great Northern Line, commences at Milson's Point, and passes through a number of rapidly-growing townships. The chief of these settlements are *Chatswood*, *Gordon*, *Pymble*, and *Turramurra*. A cable tramway traverses North Sydney from Milson's Point to *Willoughby*, and from "St. Leonards Park" (a recreation ground, 40 acres in extent, on the heights in the middle of the town) an electric tramway is constructed along the Military-road to Mosman's Bay. One of the many interesting sights of North Sydney is a large suspension bridge over a branch of Middle Harbour. Population, 18,000.

Brooklyn (formerly Peat's Ferry), on the Hawkesbury River, 36 miles from Sydney, near the southern end of the Hawkesbury Railway Bridge, which here spans the river and completes the railway communication between Brisbane and Adelaide. It is a favourite tourist resort, possessing special facilities for fishing and boating. Population, 300.

Manly, a pretty township and favourite seaside resort, situated on the isthmus connecting North Head with the mainland. It is noted for its facilities for sea-bathing, having a fine beach facing the ocean. A road leads from Manly northward to *Narrabeen* (on Narrabeen Lagoon) and *Newport* (on Pittwater). Population, 3150.

Granville, situated at the junction of the Great Southern and Great Western Railway systems, 13 miles from Sydney, has numerous manufactories, the chief of which are: Pipe and tile works, Clyde Smelting Works, railway carriage works, tweed factory, plough factory, kerosene refinery, and numerous brickworks and tanneries. Population of municipality about 5000.

Rockdale, Arncliffe, Kogarah, and Hurstville are rapidly-extending residential townships on the Illawarra railway line, all within a short distance of Sydney.

(*b*) IN THE BRISBANE WATER DISTRICT.

Gosford is situated at the northern extremity of Brisbane Water, an arm of Broken Bay, the estuary of the Hawkesbury. It is also an important railway station on the Great Northern Line, and the centre of a timber and fruit-producing district. For sportsmen there is abundant fishing and shooting within easy reach of the town. Population, 680.

(*c*) IN THE HUNTER RIVER DISTRICT.

Newcastle, the great coal emporium of Australia, is situated on the southern shores of the estuary of the Hunter, and is distant 102 miles, by railway, from Sydney. It is the second seaport of the colony, and has a tidal rise and fall of about five feet in the harbour. The depth of the water alongside the wharves is about 23 feet, and varies from 27 feet to

30 feet in mid-stream. The mouth of the Hunter was discovered by Lieutenant Shortland on September 16th, 1797, when on an expedition to Port Stephens in pursuit of runaway convicts. He called the stream Coal River, but afterwards, in honour of Governor Hunter, it received the name it now bears. The harbour has, by artificial means, been rendered commodious and secure ; but, notwithstanding the erection of the Southern Breakwater, the entrance to the port is still dangerous during E.S.E. gales. Powerful dredges are continually at work deepening and clearing the channels and wharf frontages. Commodious wharves—nearly two and a half miles in length—provided with hydraulic and steam cranes, line the shores. Several manufactories are in operation at and around Newcastle, comprising boot, cordial, carriage, and biscuit factories, shipbuilding and fellmongery yards, a brewery, foundries, smelting and engineering establishments. Nearly all the produce of the Hunter River Valley, together with a great portion of that of the Northern Tableland and the Liverpool Plains, is sent by rail to Newcastle for shipment. The principal articles of export are coal, wool, frozen meat, tallow, and farm produce. The yearly output of coal alone is nearly three million tons, and it is said that the appliances for its shipment at Newcastle are unequalled at any coaling station in the world. The city proper is built upon and at the foot of a hill, which rises abruptly from the harbour. The streets are well paved, and are lighted with electricity. Newcastle is surrounded by populous mining townships, most of which are connected by tramway with the city. The chief of these are—*Stockton*, *Hamilton*, *Lambton*, *Wallsend-Plattsburg*, *Merewether*, *Tighe's Hill*, *Wickham*, and *Waratah*. As already stated, a lighthouse with fixed white light, is erected on Nobby's, and a red light is fixed at the end of the Southern Breakwater. Fort Scratchley —said to be the strongest in Australia—protects the entrance to the harbour. The population of the city proper is 24,000 ; but, inclusive of the surrounding mining townships, it is estimated at over 60,000.

West Maitland, a place of considerable trade, is situated on the Great Northern Railway, 20 miles from Newcastle, in the midst of rich agricultural lands. The town is built on the banks of the Hunter, and High-street, its main thoroughfare, follows the windings of the stream. The bed of the river is little below the level of the town and of the surrounding low-lying alluvial country, and terribly destructive floods have, from time to time, inundated both. In March, 1893, a terrible flood occurred, covering the greater part of the town to the depth of 12 feet, and converting the whole of the low-lying region between Maitland and Newcastle into a vast inland sea. Strong embankments, erected at a cost of £30,000, line the river banks alongside the town. Lucerne, maize, grapes, oats, potatoes, pumpkins, and melons are the chief agricultural products of the surrounding district ; and coal deposits, of great extent, occur within a short distance of the town, and are worked at *East Greta* and *Farley*. The manufacturing establishments include gas and ice works, coach, boot, and tobacco factories, extensive wool-scouring works, and a brewery. West Maitland possesses a cathedral, numerous churches and schools, a hospital, benevolent asylum, and school of arts. Large and elaborately-equipped sheep and cattle saleyards are erected at Campbell's Hill, adjoining the town, where almost all the stock required for consumption by the inhabitants of the lower Hunter Valley are sold by auction. Population of municipality, 7700.

East Maitland is separated from West Maitland by Wallis Creek, and is, for the most part, built on higher ground. Like West Maitland, it is surrounded by rich agricultural lands, but its population and trade are not nearly so great. 'Buses ply regularly to West Maitland, and the railway passes through the town The chief public buildings are a large gaol, courthouse, mechanics' institute, lands and roads offices, public high school for boys, and several churches and schools. Population of municipality, 3000.

Morpeth is situated at the head of the navigation of the Hunter, 30 miles from Newcastle, and about half a mile above *Hinton*, a township at the junction of the Paterson and the Hunter. A branch railway line connects Morpeth with East Maitland, four miles distant. The staple products are similar to those of Maitland. Vessels of 800 tons trade regularly with Sydney. Population of municipality, 1100.

Branxton is situated about 15 miles west of Maitland, and within half a mile of the Great Northern Railway. The district is principally occupied by farmers, graziers, and vignerons. Population, 650.

Lochinvar is situated near the Great Northern Railway, six miles west of Maitland. The Hunter River runs close by, and the surrounding lands yield large quantities of agricultural produce. There are several large vineyards close to the town. Population, 460.

Greta, a coal-mining township, on the Great Northern Railway, 32 miles from Newcastle. The Greta coal is largely used for gas-making, and nearly 300 men are employed in the two collieries. There are several vineyards within the district. Population, 1800.

Singleton is situated on the banks of the Hunter, and is a station on the Great Northern Railway, 49 miles from Newcastle. It is the centre of a rich pastoral and agricultural district, and is liable to occasional inundation The country in the immediate vicinity of the town is called Patrick's Plains, so named by the first explorers of the Hunter River Valley, John Howe and Benjamin Singleton, who pitched their camp there on St. Patrick's Day, 1825. There are several creameries, a butter factory, and a few small collieries in the district, the chief of which is at Rix's Creek. The Singleton Show is held annually under the auspices of the Northern Agricultural Association, one of the most flourishing of its kind in the colony. Population of Singleton and South Singleton, 2900.

Denman stands on the Hunter, about three miles above its junction with the Goulburn, in the midst of rich alluvial flats devoted to grazing and farming. Population, 250.

Muswellbrook is situated on the left bank of the Upper Hunter, 76 miles from Newcastle. The Great Northern Railway passes through the town. The surrounding district is chiefly agricultural, wheat and maize being largely raised. The vine and tobacco are grown to a limited extent, and grazing also receives attention. Population, 1800.

Aberdeen, on the east bank of the Upper Hunter, is a railway station nearly mid-way between Muswellbrook and Scone, and the seat of extensive meat chilling and freezing works. The surrounding district is pastoral and agricultural. Population, 700.

Scone, surrounded by mountains and prettily situated on the Kingdon Ponds, a tributary of the Hunter, is a station on the Great Northern Railway, 75 miles from Maitland. Wheat, maize, and tobacco are grown in the district, and gold-mining is carried on to a limited extent. The wild and picturesque scenery of the Flat Rock district, about a mile from the township, is highly spoken of. About 10 miles north of Scone is Mount Wingen, whose continually-burning coal beds are a source of attraction to tourists. Population, 1200.

Murrurundi, on the Page River, a tributary of the Hunter, is a railway station on the Great Northern Line. The town is situated at the foot of the Liverpool Range, at an elevation of 1546 feet above sea-level. A few miles from the town the Liverpool Range is pierced by a railway tunnel 528 yards long, which emerges on the other side of the range at Doughboy Hollow. The surrounding district is mainly pastoral. Population, including Haydonton, 1200.

Merriwa, on the Merriwa Creek, a tributary of the Goulburn, is surrounded by good pastoral and agricultural country. Maize and the vine are largely grown. Population, 700.

Cassilis, on the Munmurray River, is within eight miles of the Dividing Range and 90 miles from Muswellbrook. The district is well watered, and is purely a pastoral one. Population, about 200.

Paterson, situated at the head of the navigation of the Paterson River, a tributary of the Hunter, is in the midst of good agricultural country. The chief crops are cereals, potatoes, lucerne, oranges grapes, and tobacco. Dairying is also largely carried on. Large willows line both sides of the Paterson River for many miles between the township and Maitland. Population, 330.

Raymond Terrace is prettily situated on a gentle slope on the east bank of the Hunter River, near its junction with the Williams. It is within six miles of Hexham, on the Great Northern Line, and has water communication with Newcastle and Sydney. The surrounding district is agricultural and highly productive; the grape is largely grown, and there are several vineyards within a short distance of the town. Population of municipality, 900.

Clarence Town, at the head of the navigation of the Williams River, is distant about 20 miles from Maitland. It is the centre of an agricultural district, the alluvial flats along the river banks yielding heavy crops of maize and other cereals. Population, about 500.

Dungog is situated on the Williams River above Clarence Town. Agriculture and dairy-farming are carried on in the surrounding district, which also produces wine, wheat flour, maizena, and arrowroot. Population, about 1000.

Wollombi (on the Wollombi Brook), Gresford (on the Paterson), and Bandon Grove are other townships in the Valley of the Hunter.

(*d*) IN THE COUNTY OF GLOUCESTER.

Stroud is situated a short distance from the Karuah River, and 32 miles north of Raymond Terrace, in an agricultural and pastoral district. Maize is largely grown, and the abundant timber supplies employ numerous

mills. The Copeland goldfield, in which are the townships of COPELAND NORTH and BARRINGTON, occupies the north-western portion of the district. Population, 400.

BULLADELAH is situated at the head of the navigation of the Myall River, which flows into Port Stephens. Alum-stone, yielding about 80 per cent. of pure alum occurs in a large deposit near the township, and is shipped in large quantities to England, where works have been erected for the treatment of the raw material. The timber trade of the district is large. Population, 320.

FORSTER is a township and harbour of refuge at the entrance to Wallis Lake, near Cape Hawke. The chief product of the district is timber.

(*e*) IN THE MANNING RIVER DISTRICT.

TAREE is situated on the north bank of the Manning, about 20 miles from the sea, and four miles from the Dawson junction. The soil on the banks of the river is deep and fertile, and large crops of maize, wheat, barley, potatoes, and oranges are grown. Dairy-farming is an important industry, and creameries are numerous in the district. Steamers ply regularly between Taree and Sydney. Population of municipality, 800.

WINGHAM is situated at the head of the navigation of the Manning, eight miles above Taree, and is the outlet for the produce of the Upper Manning and its numerous tributary creeks. The industries of the neighbourhood are agriculture, dairy-farming, and timber-getting. Population, 550.

CUNDLETOWN is situated on the north bank of the Manning, four miles below Taree. The adjacent lands are agricultural, maize being the chief product. Population, 260.

CROKI is situated on the north bank of the Manning, eight miles from Harrington Inlet. It is an oyster emporium, and an important local shipping place. Population, 250.

TINONEE, on the south bank of the Manning, is a small town with a population of 300.

(*f*) IN THE HASTINGS RIVER DISTRICT.

PORT MACQUARIE is picturesquely situated on a promontory at the mouth of the Hastings. The navigation of the harbour is hindered by a bar ; but steamers of small tonnage, as well as coasting vessels, trade to Sydney. Maize, wine, barley, oats, and potatoes are the chief products of the surrounding agricultural district. A large trade in timber is also carried on. A steam drogher trades up the river for 20 miles, and brings much produce to the town for shipment. Population, 920.

WAUCHOPE is a small township on the Hastings River, 14 miles above Port Macquarie. Produce is conveyed by drogher to Port Macquarie, and thence to Sydney. Agriculture is the principal industry, but dairying is also carried on. Population, 300.

(*g*) IN THE MACLEAY RIVER DISTRICT.

KEMPSEY, the most important town in the Macleay district, consists really of three parts—East, West, and Central Kempsey—the last being the chief seat of business. The town is situated in a bend of the river about

30 miles from the Macleay Heads, and has steamer communication with Sydney. The surrounding district is very fertile. Maize and pigs are the principal export. Dairy-farming is extensively carried on, and several creameries are in operation. The town possesses a dock and a slip, and is increasing in size and importance. Population, 2100.

Frederickton is situated at the junction of Christmas Creek with the Macleay River, four miles from Kempsey. Agriculture and timber-cutting are the chief industries of the surrounding district. Population, 350.

Gladstone stands at the junction of the Belmore and Macleay Rivers. The surrounding lands are agricultural, maize being the principal product. Population, 250.

Seven Oaks and Sherwood are other small townships on the Macleay.

Nambucca, on the river of the same name, and Bellingen and Fernmount, on the Bellinger River, have communication by means of small vessels with Sydney, and export timber and agricultural produce.

(*h*) IN THE CLARENCE RIVER DISTRICT.

Grafton is a place of considerable trade on the Clarence River, about 45 miles from the sea, and accessible for ships drawing 11 feet of water. The city is divided into two parts—North and South Grafton—by the river, which is there half a mile wide, and is provided with several wharves, a patent slip, and a small floating dock. Steam ferries ply from North Grafton to South Grafton, Ulmarra, and Clarenza. Grafton is well laid out ; its main streets are very wide and are planted with trees, while the cross streets are at right angles with them, after the design of the city of Melbourne. The alluvial lowlands of the surrounding district are among the richest in the colony, and yield large quantities of maize, sugarcane, and barley, along with potatoes, tobacco, wine, and oranges to a limited extent. Of late years the dairying industry has advanced considerably, and creameries, butter factories, and bacon-curing establishments are rapidly increasing. The industries of the city comprise sawmills, tanneries, soap and candle works, gasworks, iceworks, and an extensive refrigerating creamery ; while for five months of the year the numerous sugar mills in the district are busily engaged crushing sugarcane. At Ramornie, nine miles from Grafton, the Australia Meat Works, one of the largest of the kind in Australia, are in operation. Coal of inferior quality and of little value commercially exists throughout the district, and gold-mining operations are carried on in several parts of the Upper Clarence Valley. Grafton is the seat of two bishopries – Anglican and Roman Catholic. Population, 6600.

Copmanhurst is situated at the head of the tidal waters of the Clarence, about 20 miles above Grafton. The industries are agricultural, pastoral, and mining. Steam droghers and a passenger launch ply between Copmanhurst and Grafton.

Maclean (formerly *Rocky Mouth*) is situated on the Clarence, at the junction of the North and South Arms with the main river, and 18 miles from the ocean. It is the centre of the sugar industry on the Clarence, possesses several creameries and a butter factory, and is a port for the shipment of large quantities of agricultural produce. Several passenger

steamers ply daily to Grafton (30 miles further up the river). Population, 900.

Ulmarra, on the Clarence River, nine miles north-east of Grafton, is surrounded by rich maize-producing lands. Population of municipality, 1350.

Lawrence is situated nine miles above Maclean, at a point on the Clarence called the Elbow. It is a shipping port for the agricultural products of the neighbouring alluvial lands, and for much of the wool raised about Tenterfield. The industries comprise a sugar mill, saw mills, and creameries.

Brushgrove (on Woodford Island), Nymboida (on Nymboida River), Iluka (on the north head of the Clarence River entrance), and Yamba (a seaside resort at the south side of the Clarence River entrance), are small townships in the district.

(*i*) IN THE RICHMOND RIVER DISTRICT.

Lismore stands at the head of the North Arm of the Richmond, at the junction of the Leycester and Wilson's Creeks. Sea-going steamers trade to the town, which is 22 miles by land and 72 miles by water west from Ballina. Numerous small steamers are engaged in the river trade. The surrounding district is partly agricultural and partly pastoral. Coal of good quality occurs in the district, but at places too remote from a market to be worked with profit. A railway line, connecting Lismore with Murwillumbah, on the Tweed, passes through a rich district, in which sugarcane is extensively grown. Over 1000 men are employed in the Lismore sugar mills during the crushing season. Numerous creameries and butter factories, and a Government experimental farm, are in operation, and the chief products of the district are butter, cheese, bacon, sugar, maize, and timber (mainly pine and cedar). Population of municipality, 3100.

Casino stands on the Main Arm of the Richmond, 40 miles above its confluence with the North Arm, and 90 miles from Ballina by water. A costly high-level bridge spans the river at Casino, and there are large squatting stations and sugar plantations within a short distance of the town. The industries comprise sugar-growing, squatting, dairy-farming, and timber-getting, splendid hardwood, as well as pine and cedar, being largely exported. "Three of the largest cheese factories in the colony are situated at Wooroowoolgen, Nunga, and Tomki, near Casino." The town is situated above the head of navigation, river steamers bringing goods to within a mile of it. Population, 1500.

Coraki is 14 miles from Lismore, and 18 miles from Casino, by land, and stands at the junction of the Main and North Arms of the Richmond. It is the chief shipping depôt in the district, the Casino and New England cargo being discharged here for transhipment by drogher to Casino. The main industries of the surrounding district are dairying and sugar-growing, while several saw mills and a shipbuilding yard afford employment for a large number of hands. Population, 620.

Ballina stands at the north side of the entrance to the Richmond River, and has daily communication by steamer with Lismore. The rainfall at Ballina—72 inches annually—is the highest in the colony. Agriculture and dairy-farming are extensively carried on in the district, and payable gold is obtained on the beaches north and south of the town. Population, 1300.

PRINCE STREET, GRAFTON.

Woodburn, on the Richmond, below the South Arm junction and in the heart of a sugar-growing district. Agriculture and dairy-farming are also carried on. Population, 800.

Wardell (on the Richmond, 10 miles above Ballina), Broadwater (between Woodburn and Wardell, and the site of the Colonial Sugar Company's mill, which employs 700 hands), Wyrallah (where fruits are largely grown), Codrington, and Alstonville are other townships in the Richmond River district.

(*j*) IN THE TWEED RIVER DISTRICT.

Murwillumbah, situated on the Tweed River, is the terminus of the Tweed-Lismore Railway. It has occasional communication with Sydney by means of small steamers and sailing vessels. Sugarcane is grown in large quantities in the surrounding district, and several costly and well-equipped mills have been erected for cane-crushing. An extensive timber trade is also carried on. Population, about 1500.

Tumbulgum (= meeting of the waters), a small village at the junction of the two arms of the Tweed, has communication with Murwillumbah and Tweed Heads by means of a steam launch. Population, 100.

Byron Bay, on the Tweed-Lismore Railway, 32 miles from Murwillumbah, is adjacent to Cape Byron. Dairying and sugarcane-growing are the chief industries. Population, 250.

Brunswick, a small township on the Brunswick River, has communication by small vessels with Sydney, and by coach with Murwillumbah, Lismore, and Ballina. Population, about 100.

(*k*) IN THE ILLAWARRA DISTRICT.

Wollongong, as far as shipping is concerned, ranks as the third seaport of the colony. It is situated on the South Coast, 48 miles from Sydney, and the Illawarra Railway passes it. The town is well built, and the harbour (Belmore Basin) is three acres in extent, and excavated out of the solid rock to the depth of 18 feet at low water. The chief exports from Wollongong are coal, coke, and dairy produce. The surrounding district is one of the chief localities whence the metropolis is supplied with milk. Coal is raised at Mount Keira, Mount Kembla, and Mount Pleasant, in the Illawarra Range, a few miles west of the town, and conveyed to port by private railway lines. As already stated, the first discovery of coal in the colony was made at Mount Keira in 1797, by Clark, the supercargo of the "Sydney Cove," while on his way overland to Sydney after the wreck of that vessel in Bass Strait. Wollongong is a favourite watering place, and tourists are loud in their praises of the beautiful mountain and ocean scenery within easy reach of the town. The harbour, which is fairly commodious, is provided with a breakwater and lighthouse, and is easy of entrance, except during southerly and easterly gales. Fortifications are erected on the two hills which command the entrance to the port, and are manned by a company of the Permanent Artillery. Population, 3400.

Clifton, Bulli, Woonona, Bellambi, and Corrimal are populous and busy coal-mining townships, a few miles north of Wollongong. Clifton is prettily situated on a cliff overlooking the ocean, and Bulli is within about three miles of the famous Bulli Pass. The Bulli, Woonona, South

Bulli (Bellambi), and Kembla Coal-mining Companies have each erected on the coast substantial jetties, with railways leading thereto for the shipment of coal.

UNANDERRA (the seat of a large coke manufactory on the railway line, four miles south of Wollongong.) DAPTO (near the western extremity of Lake Illawarra, nine miles south of Wollongong, in the heart of a rich dairy-farming district, and the site of an extensive smelting works); ALBION PARK (five miles further south, close to Lake Illawarra, and surrounded by dairy-farming lands); and SHELLHARBOUR (a small seaport a little to the south of Lake Illawarra), are the chief centres of population between Wollongong and Kiama.

KIAMA, "noted for its beauty, its butter, its basalt, and its Blow Hole," is a small port a little over 20 miles south of Wollongong, and an important station on the South Coast Railway. The surrounding district is devoted to dairying, and is one of the chief sources of the metropolitan butter and bacon supplies. The Bombo blue metal quarries are close to the town, and furnish employment for a large number of men. One of the sights of Kiama is the Blow Hole, a natural cavern in a basaltic cliff, through which the sea-water is violently thrown as spray to a considerable height during rough south-easterly weather. This wonderful natural phenomenon, which was discovered by Bass in 1797, is situated on the promontory which shelters the harbour on the south side, and on which a lighthouse is built. Population, 2380.

GERRINGONG (a railway-station and small seaport on the coast, six miles south of Kiama), and JAMBEROO (on the Minnamurra Creek, seven miles west of Kiama, and three miles distant from the well-known "Whispering Gully," one of the natural wonders of Illawarra), are thriving townships.

(*l*) IN THE SHOALHAVEN DISTRICT.

NOWRA, the chief town of this district, is situated on the south bank of the Shoalhaven, directly opposite Bomaderry, the present terminus of the South Coast Railway. It is 92 miles from Sydney, and 10 miles from Greenwell Point, the seaport of the Shoalhaven. One of the longest and most expensive bridges in the colony spans the river close to the town, and the rich pastoral and agricultural lands in the surrounding district are devoted to dairy-farming and the growth of cereals and potatoes. The Cambewarra Mountain, from the fern-clad slopes of which, magnificent views (including that of Jervis Bay) are obtained, is within an hour's drive of the town. Cambewarra, Kangaroo Valley, Greenwell Point, and some other small townships have telephonic communication with Nowra. Population, 3100.

BERRY, on Broughton Creek, a tributary of the Shoalhaven, is a station on the railway line, eight miles north of Nowra. The town is prettily situated, within a short distance of the base of rugged ranges over 1000 feet high, whose slopes are devoted chiefly to the growth of maize and other cereals. On the low-lying lands in the district also there are numerous farms. The staple product of the district is dairy produce. The population of the town is about 900; of the municipality, 2260.

GREENWELL POINT (on Crookhaven), NUMBA (on the Shoalhaven), TERRARA (between Nowra and Numba), KANGAROO VALLEY (a favourite

tourist resort, between Moss Vale and Nowra), and CAMBEWARRA (at the foot of the Cambewarra Mountains), are among the remaining townships in the Shoalhaven district.

(*m*) SOUTH OF THE SHOALHAVEN RIVER.

MILTON is a flourishing township in the heart of a rich dairy-farming district. It is four miles from the port of Ulladulla, and 48 miles south of Nowra, within three miles of Lakes Burrill and Conjola, and 12 miles east of the Pigeon House. Population, 800.

ULLADULLA, the port of a rich dairy-farming district, is 18 miles south of Jervis Bay. The harbour, although small is one of the safest on the coast, being protected on three sides by high land, with rocky bluffs at the entrance. The exports are dairy produce. Population, 200.

NELLIGEN, a small town situated on the western side of the Clyde River, 10 miles north-west of Bateman's Bay township. It is the outlet by sea for much of the produce of the Braidwood district, is in a pastoral and agricultural district, and has a population of 200.

BATEMAN'S BAY, a small seaport town built near the entrance of the Clyde River into Bateman's Bay. It is 20 miles north of Moruya, and exports timber, oysters, wattle bark, and fish to the metropolitan market.

MORUYA, on the Moruya River, four miles from its mouth, is the port of a rich dairy-farming district, possessing butter, cheese, and bacon factories, and flour and saw mills. The rich alluvial Moruya flats yield large crops of maize, wheat, oats, and potatoes, and the gold and silver mines of the district have been profitably worked. Population, 1150.

BODALLA, on the Tuross River, is the centre of a rich agricultural and dairy-farming district, in which numerous creameries are in operation. Population, 400.

COBARGO stands at the junction of the Wandella and Murrabrine Creeks, between Moruya and Bega. The surrounding district is devoted to dairy-farming, and Bermagui, 12 miles distant, is its seaport. Population, 350.

BEGA, at the junction of the Bembooka and Brogo Rivers, whose united waters form the Bega River, is surrounded by a fertile district, in which dairy-farming is extensively carried on. Creameries, butter, coach and boot factories, saw mills and tanneries are in operation in and near the town. The seaport is Tathra, 12 miles distant, at the mouth of the Bega River. Population, 2300.

CANDELO, 15 miles south-west of Bega, on Candelo Creek, is surrounded by an important dairying district. Tathra and Merimbula are its ports. Population, 500.

MERIMBULA, on Merimbula Lake, 16 miles south of Bega, is a seaport for the shipment of much of the produce of the Monaro district. Population, 250.

PAMBULA is situated on the Pambula River, four miles from Merimbula. Dairy-farming and gold-mining are the chief industries of the district. Population, 400.

EDEN is distant 35 miles from Cape Howe, and stands on the northern shore of Twofold Bay, which for size and security is almost equal to Port Jackson. The surrounding district is rugged, and devoted to the pastoral

industry. Steamers convey much of the produce of the district to Sydney, while live stock is sent to Tasmania and pigs to Melbourne. Whaling (confined to the bay chiefly) is carried on principally in open boats. Population, 350.

Wyndham, on the road from Merimbula to the Monaro district, is situated in a mining, agricultural, and dairy-farming district. Population, 400.

TOWNS ON THE NORTHERN TABLELAND.

Tenterfield, situated on Tenterfield Creek, within 10 miles of the Queensland border, and surrounded by lofty granite hills, is a station on the Great Northern Railway, and the chief town of an agricultural and tin-mining country. Within a radius of little over 25 miles from the town are included the Timbarra, Drake, Poverty Point, Boonoo Boonoo, and other diggings. Wheat is the principal crop raised, but tobacco and beetroot are also largely grown. Soap and butter factories, meat chilling works, flour mills, and a tannery are the chief industries of the town. Population, 2800.

Drake, distant 32 miles from Tenterfield, on the road to the Clarence and Richmond River districts, is within easy reach of the Timbarra goldfield, and is the centre of a region rich in minerals. Antimony is raised in large quantities in the neighbourhood.

Emmaville, 18 miles from Deepwater, the nearest railway station, is close to the Vegetable Creek tin-mining field, the richest in the colony. Silver is also raised in the surrounding district, and large smelting works are in operation within three miles of the town. The district possesses good agricultural land and several large sheep stations. Population, 980.

Glen Innes, which takes its name from Major Innes, one of the oldest of the New England settlers, is a station on the Northern Line, pleasantly situated on the Rocky Ponds, four miles from the Beardy River. The surrounding district is, in the main, agricultural, producing wheat and other cereals; but sheep-farming is also largely engaged in. It is within 28 miles of Emmaville (formerly Vegetable Creek), the most important tin-field in the colony. Glen Innes has coach communication tri-weekly with Grafton. Population, 3000.

Inverell, on the Macintyre River, 40 miles west of Glen Innes, is surrounded by an extensive agricultural and squatting district, possessing fertile soil, well suited for the growth of cereals and the vine. Diamond mining is carried on within a few miles of the town. Population, 3150.

Tingha, a township on Cope's Creek, a tributary of the Gwydir, is the centre of a rich tin-bearing region.

Armidale, an episcopal city, on the Dumaresq Creek, is the most important trade centre on the Northern Tableland. The Great Northern Railway passes through the town, which nestles among lofty hills, is substantially built, and enjoys a splendid summer climate. The industries of the surrounding district are chiefly squatting and agriculture, while antimony in large quantities is raised at Hillgrove, 20 miles distant, and payable gold is met with in several parts of the district. Population, 4700.

Hillgrove, a thriving mining township, 20 miles east of Armidale, is surrounded by a gold and antimony-producing district. The town

possesses an excellent water supply, and water-power and electricity are in use in the mines. Population, 3000.

Barraba, on the Manilla River, 56 miles from Tamworth, is surrounded by a farming and squatting district. Wheat is the principal crop, and gold-mining is carried on in the alluvial and quartz diggings of the district. Population, 600.

Uralla, situated on the Rocky River, is a station on the Northern Line, 3335 feet above sea-level, and surrounded by an important wheat-growing, pastoral, and gold-mining district. Population, 930.

Walcha, on the Apsley River, 12 miles from the Great Northern Railway, is in the midst of an agricultural district. Squatting and gold-mining are also carried on, and the town is 30 miles distant from the Niangala diggings. Population, 900.

Werris Creek, a station on the Northern Railway, at which the line to Moree branches off. Squatting and the growth of cereals are the chief industries in the surrounding district.

Bingara, on the Gwydir River, is noted for its diamond fields, which yielded, in 1895, 4100 gems, small in size, however, and faulty in colour. Several fairly flourishing goldfields are within about five miles of the town, and agricultural and pastoral pursuits are also largely carried on. Population, 800.

Bendemeer, a small gold-mining township on the Maluerindi River, 45 miles from Armidale, has a population of 200.

Manilla, a township at the junction of the Namoi and the Manilla Rivers, is a wheat growing centre with a population of 300.

TOWNS ON THE SOUTHERN TABLELAND.

(*a*) IN THE UPPER HAWKESBURY BASIN.

Goulburn, an important city, and the chief trade centre of the Southern Tableland, stands near the junction of the Mulwarree Ponds and the Wollondilly River. It is the principal station on the Great Southern Railway, and the point of the junction of the branch line to Cooma. The city is tastefully laid out in broad streets, lighted with gas, and has several fine public buildings (notably the Anglican and the Roman Catholic Cathedrals, and the post and telegraph offices). Good agricultural land is met with throughout the district, and the cultivation of cereals, dairy-farming, and fruit-growing are the chief industries. The manufactories of the city proper comprise tanneries, coach, boot and shoe factories, flour and saw mills, and breweries. Goulburn is noted as a favourite summer sanatorium and tourists' resort. The Wombeyan Caves, which rival those of Jenolan, are within 40 miles of Goulburn, from which they are reached by a good road. The population of Goulburn is about 10,000.

Bundanoon, Bowral, Moss Vale, and Mittagong are important stations on the Great Southern Railway, between Goulburn and Sydney. Their splendid summer climate and picturesque surroundings attract tourists and residents of the metropolis in great numbers during the warmer months of the year, and scores of Sydney merchants and professional men have established country seats near these towns.

The well-known Fitzroy Falls are within a few miles of Moss Vale, on the road to the Kangaroo Valley. Iron and coal are produced near Mittagong, which is connected by private railway with the kerosene works near Joadja Creek, 15 miles distant. "Trachyte" is quarried near Bowral and sent to Sydney in large quantities for building purposes. The permanent residents of the districts surrounding all these towns are, for the most part, engaged in farming and dairying.

(*b*) IN THE UPPER MACQUARIE BASIN.

Bathurst, an ecclesiastical city, and chief business centre in the district west of the Blue Mountains, is built on the left bank of the Macquarie River. It is a station on the Great Western Railway, 145 miles from Sydney, and has direct railway communication besides with Melbourne by means of the Blayney-Harden line, which connects the Great Western and Great Southern Railway Systems. The city, which was founded in 1815, and named by Governor Macquarie in honour of Lord Bathurst, then Secretary of State for the Colonies, is laid out in wide streets, lined with trees and is the finest inland town in the colony. The district immediately surrounding the city consists of good agricultural and pastoral lands, known as the Bathurst Plains, long in high repute for their large yields of cereal crops, chiefly wheat. Mining is also carried on to a limited extent, though not in the immediate vicinity of the city, and the once productive goldfields of Wattle Flat, Sofala, Hill End, Tambaroora, and Newbridge are within the district; while at Sunny Corner silver-mining is the chief industry. The manufactories of Bathurst include coach factories, flour mills, breweries, railway workshops, tanneries, and soap and candle, glue, and boot factories. The public buildings are of a substantial character, and the city is well supplied with churches, colleges, and schools. A fine park stands in the centre of the city. Population, 9350.

Blayney, at the junction of the Great Western and the Blayney-Harden Railway Lines, is surrounded by a large wheat-growing district. Alluvial and quartz gold-mining are also carried on to a limited extent. Population, 1300.

Millthorpe, a thriving township eight miles from Blayney, has a population of about 800. Mining, and wheat and fruit growing are the industries of the neighbourhood.

Carcoar, on the Blayney-Harden Railway Line, is surrounded by agricultural, pastoral, and dairy-farming lands. Cereals are raised in large quantities, and the surrounding district is remarkable for the varied character of its mineral wealth. The Belubula River intersects the town. Population, 650.

Orange, at the junction of the Great Western Railway with the branch line to Molong, is an important trading centre in the midst of a pastoral, agricultural, fruit-growing, and mining district. Wheat and maize are largely grown, and the fruit industry (comprising the growing of oranges, apples, and cherries) promises to attain very large proportions. Dairy-farming is also largely carried on. Orange is surrounded by mineral wealth. At Summer Hill Creek gold was first discovered in large quantities by Hargraves and others in 1851. The Lewis Ponds and Lucknow fields are the chief gold-mining centres in the district. The Wentworth mines at Lucknow have proved very rich, and in 1895 yielded over £300,000 worth of gold. Orange contains several very large stores and

flour mills, tanneries, foundries, breweries, and soap and candle factories, and is supplied with water from a large reservoir at Gosling Creek, two miles distant, which is capable of holding 125,000,000 gallons. Population (including Orange East), 5450.

Wellington, picturesquely situated at the junction of the Macquarie and Bell Rivers, is surrounded by agricultural and pastoral lands. The chief crops raised are wheat, oats, and maize. The river is spanned here by one of the largest railway bridges in the colony. The town is built at the foot of a range of hills 1000 feet above sea-level. The well-known Wellington Caves, so frequently visited by tourists, are within easy reach of the town. Population (including Montefiore, on the opposite bank of the river), 1650.

Mudgee, an important town in an agricultural, pastoral, and gold-mining district, stands on the Cudgegong River, and is the terminus of the railway which branches off from the Great Western trunk line at Wallerawang. The town is well laid out, contains numerous substantial buildings, and is lighted with gas. The wool from this district has an English as well as an Australian reputation; and cereals, wine, and tobacco are largely grown. Dairy-farming has made rapid strides during late years; but the varied mineral deposits of the district for the most part still await development. The once-productive Gulgong, Hargraves, and Pyramul goldfields are within easy distance of the town. Population, 2840.

Gulgong, 18 miles north of Mudgee, stands in the centre of a formerly rich goldfield. Some 300 gold-miners are still engaged in the district in fossicking; but the rich alluvial flats have, for the most part, been taken up by selectors and devoted to agriculture. Population, 1550.

Rylstone, a rising town on the Cudgegong River, and a railway station, distant 32 miles from Mudgee, is surrounded by a district rich in pastoral and mineral wealth. Population, 600.

Hill End, a gold-mining township, 37 miles north of Bathurst, was, about 1872, one of the richest goldfields in the colony. Population, 850.

Stuart Town (late *Ironbark*), a railway township, between Orange and Wellington, is surrounded by a district abounding in quartz reefs and alluvial goldfields. Population, 400.

Molong, an important station on the branch railway line from Orange to the Lachlan, is situated in a farming, pastoral, and mining district. A large quartz-crushing battery is in operation in the town. Population, 1275.

On the railway line between Bathurst and the Coast District are—Wallerawang (at the junction of the Great Western and Mudgee Railway Lines); Mount Victoria, Blackheath, Katoomba, Wentworth Falls, Lawson, and Springwood, nearly all of which are adjacent to beautiful scenery, and are visited during the summer months by large numbers of Sydney residents. Coaches ply daily from Mount Victoria to the Jenolan Caves, 36 miles distant. Close to Blackheath is the far-famed *Govett's Leap* cascade and the magnificent *Grose Valley*, and within a mile of the Katoomba railway station is *Leura Falls*, the finest in the colony.

Lithgow, 96 miles by rail from Sydney and near the foot of the well-known Zig-Zag, is an important industrial centre. Coal is raised in large quantities, and iron and pottery works are important industries. In addition to these there are lime works, saw mills, and a large tweed factory. Population, 4000.

(*c*) IN THE UPPER LACHLAN BASIN.

Parkes, a mining and agricultural town on the Orange-Forbes Railway. The surrounding district comprises good pastoral and agricultural land, and several valuable gold reefs are successfully worked close to the town. Population, 3500.

Cowra, a railway town on the Blayney-Harden loop-line, is situated on the Lachlan River, and surrounded by a rich agricultural district. The railway bridge, spans the Lachlan half a mile from the town. Gold and copper mining, fruit and grain growing, and dairying are the chief industries of the district. Population, 1750.

Tuena, a township on Tuena Creek, a tributary of the Abercrombie River, is distant 36 miles from Newbridge, the nearest railway station on the Western Line. Squatting, gold-mining, and agriculture are the pursuits of the district. Population, 600.

Crookwell, on the Crookwell River, a tributary of the Lachlan, is the chief town in the Argyle electorate, and is the centre of a district producing wheat, oats, and potatoes in large quantities. Population, 700.

Young, standing on Burrangong Creek, in one of the richest grain-growing districts in the colony, is a station on the Blayney-Harden loop-line. The town is pleasantly situated, and lighted with electricity, and the surrounding district is devoted to the cultivation of cereals and the vine and to gold-mining. Meat chilling is extensively carried on, and the Burrangong alluvial diggings are close to the town. Population, 3000.

Boorowa (or Burrowa), a well-laid out town on the river of the same name, and 16 miles from Binalong, on the Southern Line, is the chief trading centre of a flourishing pastoral and agricultural district. Dairy-farming and wine-growing are also carried on. Two large volcanic hills, Big and Little Carramumbola, close to the township, add to the picturesqueness of the landscape. Population, 750.

(*d*) IN THE UPPER MURRUMBIDGEE BASIN.

Murrumburrah, a pastoral, agricultural, and mining town on a tributary of the Jugiong River, is a station on the Great Southern Railway, two miles from Harden and about 20 miles from Young, Binalong, Jugiong, and Cootamundra. The Blind Creek gold diggings is about two miles from the town. Population of municipality, 1800.

Cootamundra, an important station on the Great Southern Line, and from it branch lines are constructed to Temora and Gundagai. The town is well laid out, and is surrounded by a pastoral, agricultural, and dairy-farming district. Gold-mining is also carried on to a limited extent. The chief agricultural product is wheat. Population, 2500.

Yass, on the Yass River, a tributary of the Murrumbidgee (10 miles distant), is an important town near the Great Southern Line. Two costly and substantial bridges span the river, one carrying the railway, the other leading to North Yass. Agricultural and pastoral pursuits are carried on in the adjoining district, and alluvial gold is obtained along the Yass River, but the mineral resources of the district are undeveloped. Population, 1800.

GUNDAGAI, situated at the head of navigation of the Murrumbidgee, is connected by rail with the Great Southern Line at Cootamundra, 34 miles distant. The site of the present town is elevated and beyond the reach of floods, the original township on the river flat having been washed away in 1852, when 71 dwellings were wrecked and 81 lives lost. Squatting and farming are the pursuits of the adjoining district. Gold-mining is also carried on, and splendid white marble occurs within a few miles of the town. A costly iron bridge, connecting with South Gundagai, here spans the Murrumbidgee. Population, 980.

ADELONG, a mining township on Adelong Creek, 23 miles south of Gundagai and the centre of one of the oldest quartz-reefing and alluvial goldfields in the colony. Many deep mines exist near Adelong, and the promoters of the Great Victorian Claim (1000 feet deep) secured the award offered by the Government for the first discovery of payable gold in the colony at a greater perpendicular depth than 800 feet. Population, 1170.

TUMUT, an agricultural and gold-mining town on the south bank of the Tumut River, and 20 miles from Gundagai. The Tumut district has been long noted for its cereals, and cattle fodder is largely grown on the alluvial flats along the river banks. Population, 1300.

COOMA, the chief town of the Monaro district, is the terminus of the branch railway line from Goulburn. The town is situated in a hollow and encircled by ranges, which raise their rugged shoulders tier above tier as far as the eye can reach. Cooma is now in great favour with tourists, as it is within easy reach of Mount Kosciusko and the Yarrangobilly Caves, while its summer climate is cool and bracing. Squatting, agricultural, dairy-farming and mining (to a limited extent) are the industries of the district. Cooma stands 2657 feet above sea-level, and the Murrumbidgee flows within five miles of the town. Population, 2000.

ADAMINABY, a pastoral and agricultural township, on the road from Cooma to Kiandra, is a well-known halting-place for tourists to the Yarrangobilly Caves. It is 26 miles from Cooma, and stands at an elevation of 3000 feet above sea-level.

CAPTAIN'S FLAT is a thriving township, 24 miles from Bungendore, the nearest railway station, on the Great Southern Line. Gold, silver, and copper are mined in the neighbourhood.

QUEANBEYAN, a railway town on the Goulburn-Cooma Line, is situated on the Queanbeyan River, in the heart of a pastoral and agricultural region. Gold-mining is carried on in a few places in the district, which is said to possess large deposits of copper, silver, lead, and iron. Population, 1425.

BUNGENDORE, a thriving township on the Goulburn-Cooma line, 43 miles from Goulburn and within four miles of Lake George. Quartz-reefing, farming, and squatting are the chief industries of the surrounding district. Population, 700.

(*e*) IN THE UPPER MURRAY BASIN.

TUMBERUMBA, an agricultural and mining township, 40 miles from Tumut, is noted for its salubrious climate. Wheat, potatoes, and tobacco are largely grown, and gold-mining is also successfully carried on. The Ournie goldfield is 20 miles south of the town. Population, 500.

(*f*) THE CHIEF REMAINING TOWNS ON THE SOUTHERN TABLELAND ARE—

BRAIDWOOD, standing on the Jillimatong Creek, a tributary of the Shoalhaven, distant five miles from the town. The industries of the district are agriculture and dairy-farming, while gold-mining is also carried on, chiefly at Major's Creek and Jembaicumbene. Braidwood is distant 28 miles from Tarago, on the Cooma line. Population, 1780.

ARALUEN, a gold-mining township in the well-known Araluen Valley. The surrounding district is mountainous and very picturesque. Pastoral pursuits and agriculture are carried on in portions of the valley. Population, 230.

TOWNS IN THE SNOWY RIVER BASIN.

KIANDRA, a declining gold-mining township, 4640 feet above sea-level, is situated on the Eucumbene Creek, a tributary of the Snowy River. It is distant 14 miles from the Yarrangobilly Caves, and is becoming a favourite summer sanatorium. In winter the streets are occasionally piled up with snow-drifts, and for many months of the year the people, young and old alike, go about on snow-shoes. A carnival, consisting of races in snow-shoes, is held annually in the township. Population, 250.

BOMBALA, on the Bombala River, is a leading trade centre of the Monaro district. The surrounding district is occupied by farms and stations, and gold-mining is carried on near the Victorian border. Bombala has coach communication with the seaports of Tathra, Merimbula, and Eden, and also with the railway at Cooma (54 miles distant). Population, 1020.

CATHCART, a few miles north-east of Bombala, is a small pastoral and agricultural township, having coach communication with Eden and Cooma.

BUCKLEY'S CROSSING, 30 miles from Cooma, and an important crossing-place for stock over the Snowy River, is situated on the road from Cooma into Gippsland. Wheat-growing and grazing are the industries of the district. Population, 400.

DELEGATE, on the Delegate River, is a small township, 22 miles from Bombala, and close to the Victorian border. Population, 200.

TOWNS IN THE INTERIOR PLAINS.

MOREE, the present terminus of the North-Western Railway, stands on a small stream within two miles of the Gwydir River. The district is a pastoral one, and cereals and fruit flourish. A very successful artesian bore is in operation at Moree. Population, 1600.

WALGETT is a rising town, situated at the junction of the Namoi and Barwon Rivers. It is surrounded by large sheep and cattle stations, and commands the trade of an extensive district, stretching northward to the Queensland border. During freshets, small steamers can trade up the Barwon as far as this town. There is regular coach communication with Narrabri. The Euroka Artesian Bore, 12 miles from the town, yields four million gallons of water daily. Population, 700.

Wee Waa, on a lagoon of the same name near the Namoi River, is 25 miles west of Narrabri. It is surrounded by sheep stations, and has a population of 400.

Narrabri, an important station on the North-Western Railway, stands on the Narrabri Creek, a branch of the Namoi River, in the midst of a pastoral, agricultural, and dairy-farming district. Large crops of wheat, maize, and potatoes are raised near Narrabri, and several butter factories are in operation. The low-lying portions of the district are liable to inundation. Population, 2450.

Tamworth, situated on the Peel, is an important station on the Northern Railway, and the chief town of a mining, pastoral, and agricultural district, which includes the goldfields of Bowling Alley Point, Nundle, and Hanging Rock. The town is built on the slope of a mountain spur, and the Peel River is spanned by a splendid bridge. Several mills and factories are in operation in the town. Population, 5100.

Gunnedah, an important station on the North-Western Railway, is situated on the Namoi River, near its junction with the Mooki. The district is a pastoral and agricultural one. Large crops of wheat, maize, and potatoes are raised; and several small collieries are worked in the district. The industries of the town consist of boiling down and meat freezing works, and several saw mills. Population, 1250.

Quirindi, on Quirindi Creek, a tributary of the Namoi, is the nearest station on the Northern Line to the Liverpool Plains. The surrounding district is devoted mainly to the growth of cereals, the annual yield being about 200,000 bushels. Much of the stock from the Liverpool Plains is trucked here for sale at Maitland and the metropolis. Population, 1500.

Coonabarabran, situated on the Castlereagh River, about 20 miles from its source, has coach communication with Gunnedah and Mudgee. The district is well watered, and grazing and farming are its chief industries. In the town there are several flour mills and a fruit-canning establishment. Population, 800.

Coonamble is situated on the Castlereagh River, in the midst of a sheep-grazing district, and has coach communication with Dubbo, distant 100 miles to the south. The Coonamble artesian bore, sunk to the depth of 1300 feet, yields 2,000,000 gallons of water daily. Population, 1100.

Brewarrina, on the Barwon River, 70 miles above Bourke, is the centre of an extensive pastoral district. The nearest railway station is Byrock, 75 miles distant. A large iron bridge spans the Barwon at this place. Population, 500.

Bourke, the terminus of the Great Western Railway, stands on the left bank of the Darling, seven miles below the Bogan junction, and is distant 503 miles north-west from Sydney. Six miles below the site of the present town Sir Thomas Mitchell, in 1835, when in search of the ultimate destination of the Darling River, erected a wooden barricade as a means of defence against the blacks. This he called Fort Bourke, in honour of Sir Richard Bourke, the Governor of the colony. The surrounding district is occupied by sheep stations, and the boiling-down and meat-preserving works in the town treat about 2500 sheep per day, and employ 200 hands. A weir and lock have been constructed in the river some distance below the town, and steamers from South Australia trade up to and beyond Bourke, except in the dry season.

Photo by Rev. J. Milne Curran.

POOLE'S GRAVE, NEAR STURT'S DEPÔT GLEN.

Several successful artesian wells have been put down throughout the district. During favourable seasons the surrounding plains are clothed with good pasturage, and at intervals belts of saltbush occur. Population, 3500.

COBAR is an important copper-mining town, connected by rail with Nyngan, on the Great Western Railway. The surrounding district is devoted to grazing and to copper and gold mining. The value of the copper raised here in 1896 exceeded £100,000, and the quartz reefs of the district yielded in the first six months of 1896 gold to the value of nearly £52,000. The Great Cobar Copper Mine, the largest of its kind in the colony, employs 500 men. At *Wrightville*, a few miles from Cobar, there is a hundred-head stamper battery, the largest in the colony. Population, 3000.

NYMAGEE is a pastoral and copper-mining township, 68 miles from Nyngan. The Nymagee copper mine employs 200 hands, and its yearly yield is valued at £20,000. Population, 450.

NYNGAN, on the Bogan River, is a station on the Great Western Railway, at the junction of the branch line to Cobar. The district is pastoral and agricultural, and boiling-down and meat chilling works are in operation in the town. Population, 1150.

DUBBO, on the Macquarie River, distant 278 miles by rail from Sydney, is a flourishing township in an extensive pastoral district. The cultivation of cereals and fruits is also carried on to a limited extent in the district; but, although the soil is good, the climate in summer is usually too hot and dry for this industry. The town possesses several manufacturing establishments, and a fine railway bridge, spanning the Macquarie. Population, 3450.

WARREN, the most important town on the Macquarie beyond Dubbo, is surrounded by large sheep stations, and is 12 miles distant from Nevertire, on the Great Western Railway. Population, 800.

PEAK HILL, on the Bogan, 45 miles S.W. of Dubbo, is a gold-mining town, with a population of 1200.

MOUNT HOPE, a small copper and gold mining township in the Lachlan district, with coach communication to Nyngan and to Hillston. Population, 250.

WILCANNIA is an important town on the Darling, from which much wool and stock from north-western New South Wales and south-western Queensland is shipped. The surrounding district is devoted to grazing. At the White Cliffs, 60 miles from Wilcannia, some of the finest noble opal is found, and more than 300 men are at work on the field. Wilcannia is the trade centre for several outlying townships, such as Milparinka, near Mount Brown, and Wanaaring, on the Paroo. Population, 1000.

BROKEN HILL, situated in the heart of the Barrier silver-field, is, after Sydney, the most populous town in the colony. It is connected by railway with Port Pirie and Adelaide, in South Australia. The ore deposits of the Barrier contain all the different species of silver ore, are rich in lead, and contain in addition a fair percentage of gold, copper, and zinc. One of the mines—the Proprietary—is regarded by mining experts as the richest silver mine in the world. Operations were commenced at this mine in 1886, and since then it has been worked day and night, in three "shifts," and has already (1897) paid nine millions sterling in dividends. The Broken Hill silver mines employ over 5000 hands, and

Photo. by Rev. J. Milne Curran.

STURT'S DEPÔT GLEN.

their concentrating, amalgamating, smelting, and refining plants are of the most modern description. The limestone fluxes used in smelting are obtained in large quantities from the quarries at Tarrawingee. Much of the low-grade silver ore is sent for treatment to the sulphide works near Lake Illawarra, the establishment of which has already given a marked impetus to mining throughout the colony. The town is incorporated, and is well supplied with water from the Stephen's Creek Reservoir. Squatting is carried on extensively in the surrounding districts. Population, 25,000.

SILVERTON, another town on the Barrier silver field, stands on a small creek 18 miles from the South Australian border. The chief mines are those of Umberumberka, which extend southwards to Thackaringa, the spot where the first silver found in the Barrier was discovered by Charles Rasp, a boundary rider belonging to the Mount Gibbs run. Population, 600

MENINDIE, a pastoral township on the Darling River, 100 miles below Wilcannia, is a place of historic interest, as the spot whence Burke and Wills, in 1860, set out on their fatal journey to the Gulf of Carpentaria.

WENTWORTH stands near the junction of the Darling and the Murray, and is surrounded by extensive sheep stations. The steamer traffic on the river is large and yearly increasing. In dry seasons, when the Darling is unnavigable, Wentworth is the chief depôt whence stores are supplied to the interior. Population, 700.

BALRANALD, on the Murrumbidgee River, about 18 miles above its junction with the Murray, is surrounded by a very rich and flourishing pastoral district. The Murray River steamers trade to the town, and take away large quantities of wool for the Melbourne market. Population, 750.

HAY, the terminus of the South-Western Railway, is prettily situated in a bend of the Murrumbidgee River, and is surrounded by large sheep stations. For about nine months in the year steamers ply between Hay and Adelaide. This town is the chief receiving station for the wool clip of the Lachlan and Murrumbidgee. A fine iron bridge, nearly a quarter of a mile long, spans the Murrumbidgee at Hay. Population, 3200.

NARRANDERA is a station on the South-Western Railway, at the junction of the branch line to Jerilderie. The town stands on the Murrumbidgee, and is the chief crossing place for stock travelling from Queensland to Wagga. Albury, and Melbourne. The river is here crossed by a massive lattice girder railway bridge. The district is mainly pastoral, but agriculture is rapidly extending. Population, 1700.

FORBES, the chief town of the Lachlan goldfields, has railway connection with Orange, *via* Parkes and Molong. Squatting, agriculture, and gold-mining are the chief industries of the district, and its chief agricultural products are wheat, maize, oats, and potatoes. The industries of the town comprise woolscouring and meat chilling works, breweries, and saw and flour mills. Population, 3700.

CONDOBOLIN, HILLSTON, and BOOLIGAL are important townships on the Lachlan, in the midst of extensive sheep stations. Condobolin has now direct railway communication with Sydney.

GRENFELL, on Emu Creek, 24 miles from Cowra, stands in a pastoral, agricultural, and gold-mining district. Wheat, maize, and the vine are the chief agricultural products. An extensive cyaniding works treats over

1000 tons of ore weekly and gives employment to a large number of men. The Weddin Mountains are seven miles distant from the town. Population, 1750.

TEMORA, a gold-mining town, connected by railway with the Great Southern Line at Cootamundra. "Numerous nuggets, of various sizes, from 175 ozs. downwards, have been found at the Temora goldfield," and the district is also well adapted for wheat-growing, and the agricultural industry generally. Population, 1800.

WYALONG, one of the most important gold-mining towns in the colony It is distant 40 miles west of Temora, and is a place of considerable trade Population, about 5000.

JUNEE, an important town on the Great Southern Railway, at the point of junction of the branch line to Narrandera and Hay. It is in the midst of one of the chief wheat-growing districts in the colony. Agriculture and squatting are the main industries of the people in the surrounding district, and a large railway locomotive depôt in the town employs a large number of hands. The town has an elaborate water supply, the reservoir being capable of holding 140,000,000 gallons. Population, 1730.

WAGGA WAGGA, the chief town in Riverina, is situated on the Murrumbidgee River, and is one of the most important towns on the Great Southern Railway. It is in the midst of a flourishing pastoral district, and agriculture and gold-mining are also carried on. The chief agricultural products are cereals, tobacco, potatoes, and wine. A highly-successful experimental farm, conducted under Government control, is in operation near the town. A massive railway bridge, provided with elaborate approaches, spans the Murrumbidgee. The Hampden Bridge also crosses the Murrumbidgee and serves for general traffic. Wagga possesses one of the most complete pastoral and agricultural show grounds in the colony. Population, 4500.

JERILDERIE, situated on the Billabong Creek, 40 miles from the Victorian border, is connected by rail with the South-Western Line at Narrandera. Squatting and farming are the pursuits of the surrounding district. Population, 700.

GERMANTON is distant 38 miles from Albury, in a district occupied by stations, farms, and vineyards. Population, 400.

ALBURY, a very pretty town, on the right bank of the Murray, is connected with Wodonga in Victoria, by two bridges—a substantial wooden structure for ordinary traffic, and a handsome iron lattice bridge for the railway service. In 1824 Hume and Hovell, the first explorers of the Upper Murray, crossed the river at a point north-east of Albury. The surrounding district is agricultural and pastoral and gold-mining is also carried on. The grape flourishes in the district, and Albury wines are in great request all over Australia, and have acquired a European reputation besides. Tobacco culture and dairy-farming are the chief remaining industries of the district. Small steamers trade to Albury for the greater part of the year. Population, 5900.

CULCAIRN, a small township at the junction of the Corowa branch with the Great Southern Railway, has daily coach communication with Germanton. Population, 250.

Corowa, on the Murray, 40 miles below Albury, has direct railway communication with Sydney by the branch line to the Great Southern Railway at Culcairn. It is within half a mile of the Wahgunyah railway station, in Victoria, being thus within easy reach of Melbourne by rail. Large quantities of wheat are raised in the district, and the rich chocolate soil has been found admirably suited for the growth of heavy, sweet wines. Population, 2000.

Deniliquin is a thriving pastoral, farming, and wine-growing town in Riverina, and is connected by a private line with the Victorian railway system at Moama. The surrounding district consists of vast plains, covered with native grass and saltbush, intersected by clumps of timber, and occupied for sheep and cattle runs and selections. The town is lighted with gas, and has a population of 2700.

Moama is a border town, standing on the north bank of the Murray, opposite Echuca. The river is here spanned by a massive iron bridge for the railway and general traffic. It was constructed at a cost of £100,000, at the joint expense of the New South Wales and Victorian Governments. The surrounding district is devoted to agriculture and grazing. Population, 880.

RAILWAYS.

With the exception of two short lines—viz. (i.) from Deniliquin to Moama and (ii.) from Broken Hill to the South Australian border – the railways of New South Wales are entirely under Government control, and have been constructed on a four feet eight and a half inch gauge. Their existence dates from 1855, when the line from Sydney to Parramatta was opened for traffic. Since that time the other lines have been constructed from time to time with the progress of settlement and trade, and the colony now possesses a very serviceable network of lines connecting the chief centres of population, and all converging more or less upon the great shipping ports of Sydney and Newcastle. The three great trunk lines are—(i.) the *Great Southern*, from Sydney to Albury, where it connects with the railway system of Victoria ; (ii.) the *Great Western*, stretching from Sydney westward across the Blue Mountains, and onward to Bourke, on the banks of the Darling ; and (iii.) the *Great Northern*, from Sydney, *via* Newcastle, to the Queensland border, where it connects with the railway system of the northern colony at Wallangarra. By means of the Great Northern and the Great Southern Lines a complete connection by rail exists between Brisbane, Sydney, Melbourne, and Adelaide.

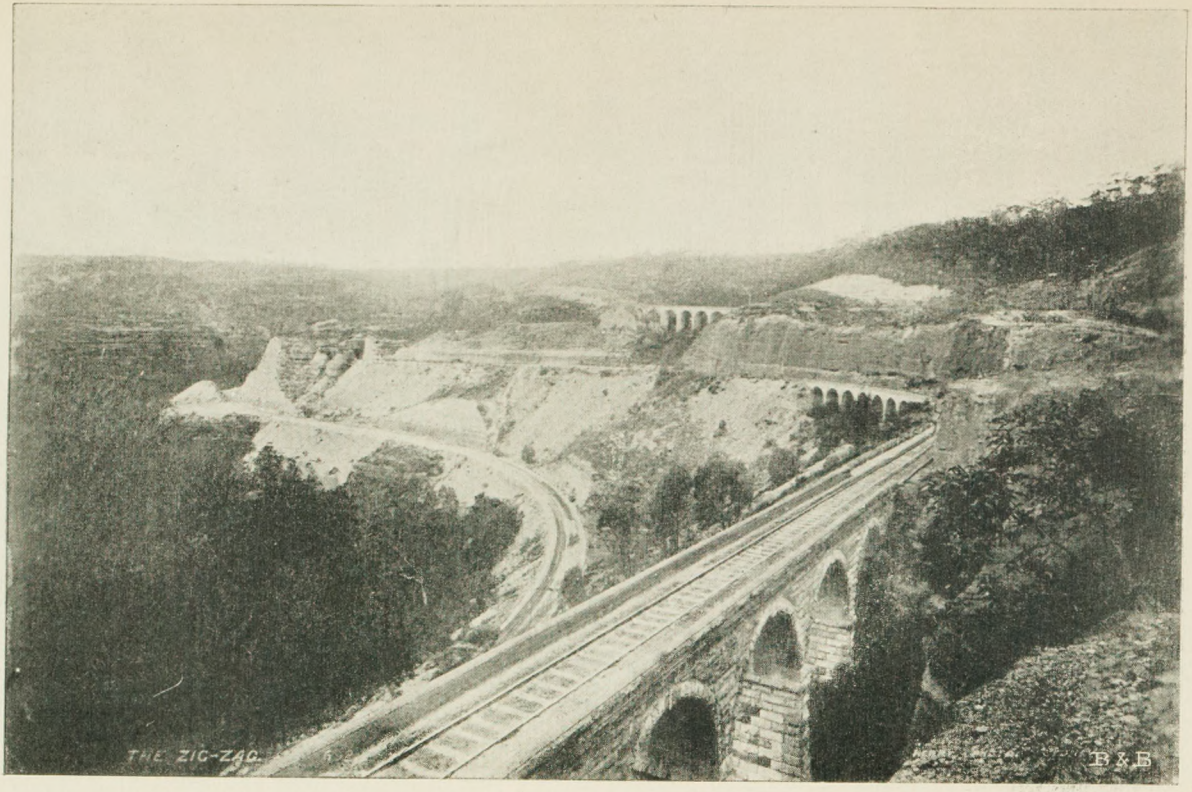
In addition to the trunk lines several branch lines have been constructed through different parts of the colony to act as feeders to the parent systems and to serve the requirements of important industrial centres. Of these the principal are :—

(i.) *Nyngan* to *Cobar Line*.

(ii.) The *North-Western Line*, from Werris Creek through the Liverpool Plains *via* Gunnedah and Narrabai, and terminating at Moree, on the Gwydir.

(iii.) The *Wallerawang* to *Mudgee Line*, *via* Rylstone.

(iv.) The *Blacktown* to *Richmond Line*, *via* Windsor.



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THE LITHGOW ZIG-ZAG.

Kerry, Sydney.

(v.) The *Blayney* to *Harden Line*, forming a loop between the Great Western and Great Southern Lines.

(vi.) The *Orange* to *Forbes Line*, *via* Parkes, with a further branch from Parkes to Condobolin.

(vii.) The *Cootamundra* to *Temora Line*.

(viii.) The *Cootamundra* to *Gundagai Line*.

(ix.) The *Junee* to *Hay Line*, which passes Narrandera.

(x.) *Narrandera* to *Jerilderie Line*.

(xi.) *Culcairn* to *Corowa Line*.

(xii.) *Goulburn* to *Cooma Line*.

(xiii.) The *South Coast Line*, from Sydney southwards through the Illawarra district, and terminating on the north bank of the Shoalhaven close to Nowra.

(xiv.) *Lismore* to *Murwillumbah Line*, between the Richmond and Tweed Rivers.

In the matter of railways New South Wales bears favourable comparison with other countries. It possesses one mile of railway to every 466 persons, and the policy of the country for several years past has been to favour the construction of pioneer lines to promote settlement in outlying districts. Before the construction of any railway can be authorised by the Legislature the proposal has to be submitted for thorough investigation to a Public Works Committee, who have to furnish a report to Parliament. When any railway line is completed, its control is undertaken by the Railway Commissioners.

TOURIST RESORTS.

Within the limits of New South Wales there is to be found some of the finest scenery in Australia. Sydney Harbour, the Botanic Gardens, and numberless other places of interest within and near the metropolis, furnish abundant holiday attractions for visitors from the country districts; while, on the other hand, the residents of Sydney have the advantage of being within easy distance, by rail, of water and mountain scenes remarkable for their sustained beauty. In addition to these the colony of New South Wales can boast of the possession of the Jenolan and Yarrangobilly limestone caves, which, for extent and grandeur, have few superiors.

The chief tourist resorts, other than those close to the metropolis, are as follow:—

I.—On the Great Western Railway.—*Penrith*, *Emu Plains*, *Springwood*, *Lawson*, *Wentworth Falls*, *Leura*, *Katoomba*, *Blackheath*, *Mt. Victoria*, *Eskbank*, *Tarana*, and *Bathurst*.

Close to Penrith is the Nepean and Warragamba river scenery. Wentworth Falls, Leura, Katoomba, and Blackheath are each close to beautiful waterfalls and picturesque sunken valleys. Coaches run daily from Mount Victoria to the Jenolan Caves, 36 miles distant. The well-known *Govett's Leap*, which plunges some 520 feet into the Grose Valley is within two miles of the Blackheath railway station, and *Leura Falls*

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A SNOW DRIFT ON MT. KOSCIUSKO.

Kerry, Sydney.

the finest cascade in the colony, is close to both Leura and Katoomba. Eskbank is close to the Zig-zag, a remarkable railway engineering curiosity; and Tarana is about 35 miles distant from the Jenolan Caves, to which coaches run daily *via* Oberon.

II.—On the Great Southern Railway.—*Picton*, *Mittagong*, *Bowral*, *Moss Vale*, *Bundanoon*, and *Goulburn*.

Between Picton and Mittagong access is obtained to several places of interest. Twelve miles from Moss Vale are the *Fitzroy Falls*, with their adjoining valley scenery. Sunken valley scenery is met with close to Bundanoon, and the well-known Wombeyan Caves are within easy reach of Goulburn.

III.—On the Great Northern Railway.—*Hornsby*, the *Hawkesbury River*, *Woy Woy*, *Gosford*, *Tuggerah Lakes*, *Lake Macquarie*, and *Newcastle*, and the railway towns on the Northern Tableland.

Within easy reach of Hornsby is the *Kuringgai Chase*, a large, national reserve abounding in romantic glens and valleys. Further along the line from Sydney are the Hawkesbury River, Woy Woy, Tuggerah Lakes, and Lake Macquarie, all of which possess abundant facilities for fishing and boating, and are largely visited.

IV.—On the South Coast Railway.—*Como*, *National Park*, *Stanwell Park*, *Clifton*, *Bulli*, *Wollongong*, *Dapto*, *Kiama*, and *Nowra*.

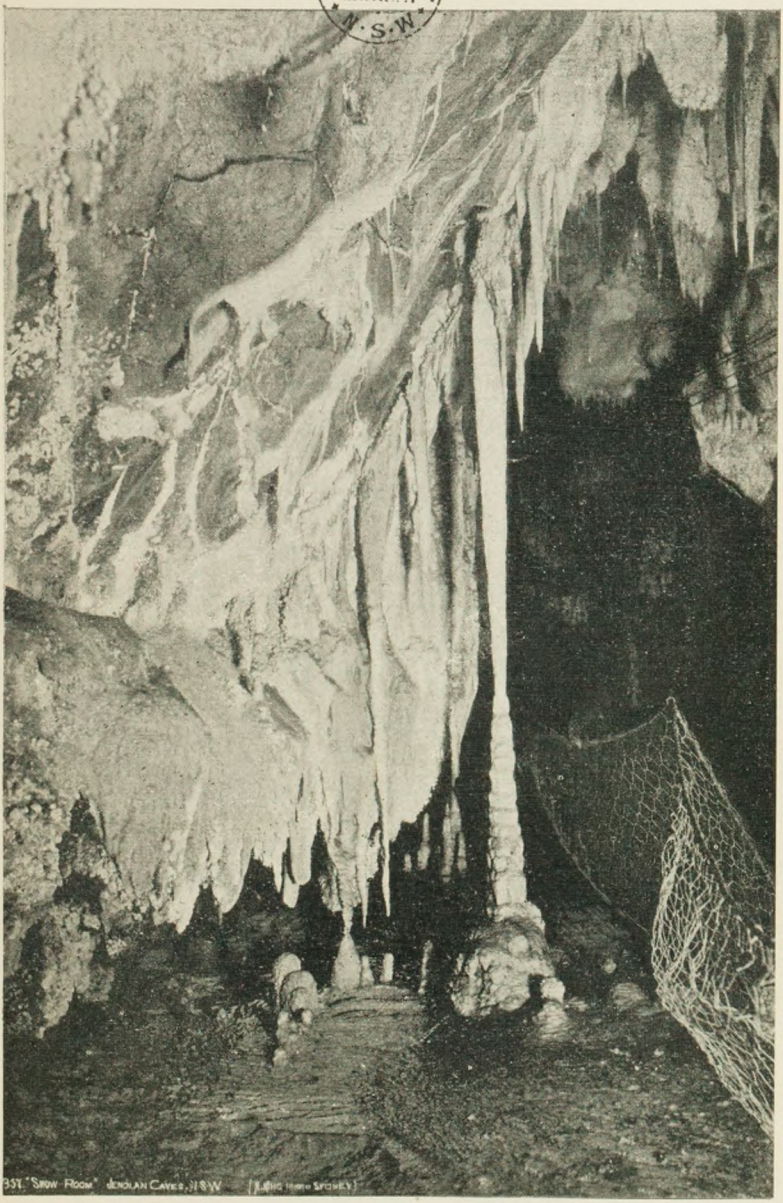
Como is a favourite fishing and boating resort, the National Park is a great public reserve possessing varied holiday attractions, Bulli is close to Bulli Pass, and Wollongong is a much-frequented watering-place. Dapto is near the Illawarra Lake. Kiama's great attraction is the *Blow Hole*; while Nowra, possessing abundant fishing facilities, is close to the Cambewarra Mountain, from the top of which the outlook is one of the finest in the colony.

V.—On the Goulburn to Cooma Railway.—*Bungendore* and *Cooma*.

Bungendore is within five miles of Lake George, and Cooma is 65 miles from the *Yarrangobilly Caves* and 60 miles from the summit of Mt. Kosciusko.

VI.—On the Blacktown to Richmond Railway.—*Windsor* and *Richmond*.

Within a few miles of Richmond are the Kurrajong Heights, and Windsor is at the head of navigation of the Hawkesbury.



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"SHOW ROOM"—JENOLAN CAVES.

APPENDIX.

A. In order to assist young students to follow more intelligently the remarks on the GEOLOGY OF NEW SOUTH WALES (pp. 70-76), the following brief notes (derivations, &c.) on some of the technical terms used are given :—

Cainozoic is from Gr. *cainos*, recent, and *zoe*, life. **Carboniferous**, from L. *carbo*, coal; *fero*, I bear. (Note that coal seams are met with in sedimentary formations of every age, but the great coal seams of Great Britain belong to the *Carboniferous*, while those of New South Wales belong to the *Permo-Carboniferous* period). The **Cretaceous** system (L. *creta*, chalk) was so named because in England and Northern France its most conspicuous member is a thick bed of chalk. The Cretaceous rocks of New South Wales do not contain any chalk, but they contain fossils of the same geological age as the Cretaceous rocks of England, and a formation is always named according to the character of its fossils. **Crinoids** (Gr. *crinon*, a lily ; *eidos*, a shape) = lily-shaped animals that once grew fixed to rocks on the ocean floor. **Devonian** rocks were so named because they were first studied in detail in Devon, England. **Diprotodon** (Gr., *dis*, twice ; *protos*, first ; *odous* gen. *odontos*, a tooth), so called because of the peculiar arrangement of its two front teeth. **Dolerite** = a coarse-grained basalt ; from Gr. *doleros* deceptive (because it was easy to confound it with *diorite*, another igneous rock). **Dyke** = a wall of igneous rock forced up through other rocks and there cooled. **Eocene** (Gr. *eos*, dawn ; *cainos*, recent) = dawn of recent (life). A **Formation** is a group of rocks. **Fossil** (L. *fossus*, dug) = the remains or the traces of the remains of a once existing animal or vegetable, now found naturally embedded in rocks. **Glossopteris** = a *fern* with *tongue-shaped* leaves (Gr. *glossa*, a tongue ; *pteris*, a fern). **Jurassic** rocks are so named because they are extensively developed in the *Jura Mountains*, in France. **Mesozoic** is from Gr. *mesos*, middle, and *zoe*, life. **Miocene** (Gr. *meion* les-) = less recent. **Palæozoic Rocks** (Gr. *palaios*, old ; *zoe*, life) are so called because they contain the earliest record of plant and animal life. **Permian**, from *Perm*, a province of Russia, where rocks of this age are well developed. **Pliocene** (Gr. *pleion*, more). **Pleistocene** (Gr. *pleistos*, most). **Silurian**, from the *Silures*, an old British tribe, who lived on the borders of England and Wales, where these rocks are developed. (Note that *Cambrian Rocks*, which are older than *Silurian*, do not occur, as far as is known, in New South Wales, but they are found in South Australia and Tasmania). **Tertiary**, from L. *tertius*, third. **Thylacoleo** (Gr. *thylacos*, a pouch ; *leon*, a lion). **Triassic** (Gr. *trias*, a group of three) has reference to the division of these rocks into three distinct groups by German geologists. **Tuff** (It. *tufo*, soft stone) is a friable rock consisting of consolidated volcanic material (stones scoriæ, dust, &c.)

B. While dealing with the structure and origin of the Blue Mountains, in his Anniversary Address read before the Royal Society in 1896, Professor David quoted the following remarks of the late Mr. C. S Wilkinson :—

"The vastness of the depth and extent of the precipitous gorges and valleys of the Blue Mountains inspires one with feelings of silent awe and wonder, and impresses the minds of some persons with the notion we hear so frequently expressed, that such ravines in the mountains must have required violent convulsions in the earth's crust for their formation. But if we examine the rocks on all sides of the valley, we see no breaks nor signs of violent disturbance as suggested. The various beds of rock in horizontal strata may be seen to continue uninterruptedly around the sides of the valley, and the succeeding layers of rock, as we descend one side of the ravine, gradually approach the corresponding layers on the other side, until at the bottom, in the bed of the water-course, we find that they actually join, which they would not do if the sides of the ravine had been violently torn asunder. We perceive, therefore, that the various outcropping strata must once have been continuous right across the valley or ravine, and that they have been removed by some agency without disturbance of the underlying beds. What then is this agency? Not *volcanic fire*, but *running water*."

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