

AUSTRALIA.

THE sea-girt continent of Australia is situated in the Southern Hemisphere, between the Indian and Pacific Oceans, and lies in that portion of the globe extending from lat. $10^{\circ} 39'$ S. to lat. $39^{\circ} 11'$ S., and from long. $113^{\circ} 5'$ E. to long. $153^{\circ} 16'$ E. On the north it is bounded by the Timor Sea, the Arafura Sea, and Torres Strait; on the east by the Pacific Ocean; on the south by Bass Strait and the Southern Ocean; and on the west by the Indian Ocean. From north to south the greatest length measures 1,971 miles, while the greatest breadth east and west is about 2,400 miles. Its superficial area is approximately 2,946,691 square miles, with a coast-line measuring about 8,850 miles. The coastal perimeter is equal to 1 mile for every 333 square miles of area—the smallest proportion shown by any of the continents. The Tropic of Capricorn divides Australia into two unequal parts, and in its vast area the continent contains every variety of climate from temperate to tropical.

As regards the general appearance of its land surface, Australia may be described as a plateau, fringed by a low-lying well-watered coast, with a depressed and, for the most part, arid interior. In its mean height, the land mass of the continent rises to a less elevation than that of any other of the continental surfaces of the globe. Fully 500,000 square miles of the area of Australia consist of a great central plain, the vast bulk of which is situated to the south of the 22nd degree; but portions of it stretch upward to the low-lying country in the region south of the Gulf of Carpentaria.

The vast cordillera of the Great Dividing Range originates in the south-eastern corner of the continent, and runs parallel with and close to the eastern shore, through the states of Victoria and New South Wales, right up to the far-distant York Peninsula of Queensland. In Victoria the greatest elevation is reached in the peaks of Mount Hotham and Mount Smyth, each over 6,000 feet in height, with various other summits exceeding 5,000 feet. The loftiest portion of the range is in the region near the confines of Victoria and New South Wales, where Mount Kosciusko reaches an altitude of over 7,000 feet. The Dividing Range, with its lateral spurs, receives various sectional names in the states through which it passes. More detailed reference to these will be found in the chapters dealing with the physical characteristics of particular states. The seaward slope of the range is

generally sharp and precipitous, and in places marked by chasms and precipices unequalled in grandeur in any other part of the world. On the western side, the descent is more gradual, the table-land merging by easy degrees into the great plain region towards the centre of the continent. In Victoria, the mountain range known as the Grampians commences near the south coast at Portland Bay, and runs in a north and south direction connecting with the Dividing Range by the Pyrenees and Australian Alps. In South Australia, a chain of mountains of no great elevation runs northward from Cape Jervis to the region occupied by Lake Torrens and other salt-water lakes. The plateau in Western Australia is traversed by ranges in various localities, and these, while of no great altitude, possess a certain grandeur in some instances, from the fact that their rugged masses rise abruptly from a level plain. Little accurate knowledge is at present possessed of the mountainous region in the "Nor'-west" district of Western Australia, and in the Northern Territory of South Australia.

The continent possesses no mountains clothed with perpetual snow, nor are there any active volcanoes on its surface. More or less conclusive signs of past glacial action have been reported from the Southern States, and there is also evidence of convulsive volcanic movements in some regions. In Victoria certain peaks in the western district have been in eruption posterior to the arrival of the aboriginal. Perfectly shaped cones may be seen, together with beds of ash and scoriæ little affected by denuding agencies. In the Mount Gambier district of South Australia there are some beautiful little crater lakes occupying the crater hollows of extinct volcanoes. Considerable outpourings of lava took place in late Tertiary times from many points in the Great Dividing Range of Eastern Australia. In the Illawarra district of New South Wales the irruption of an igneous dyke turned portion of the coal seams into a natural coke, the article being largely used on the old metropolitan steam trams. The sandstone in the vicinity of Sydney has in places been hardened by similar means. It is noticeable, however, that all recent volcanic action was confined to the coastal area, no evidence of late lava flows being met with in the plain district of the interior. For a long time Mount Wingen in New South Wales was looked upon as a volcano, but the fires of this burning mountain result from the slow combustion of coal seams in its interior, probably ignited in the first instance by the agency of lightning.

It has been customary to regard the central portion of the continent as being a vast desert, but later knowledge has caused a considerable modification of this idea. There is undoubtedly a large area occupied by barren sandhills, or covered for miles with deposits of peculiar rounded boulders. Then there is the spinifex country, which looks fair enough from a distance, but is actually more hopeless for settlement purposes than what is sometimes called the "Stony Desert," which in good seasons is covered with fine pasturage, and has been occupied for pastoral purposes.

Although there are numerous spacious harbours on the coast of Australia, the shore line, generally speaking, is broken by few remarkable indentations, the most extensive being the Gulf of Carpentaria on the north, which extends inland for a distance of 650 miles, with a breadth of 400 miles, and Spencer's Gulf, on the south, penetrating inland for 180 miles, with a breadth varying from 10 to 80 miles. On the north-west coast there are some fine inlets, but none reaches the dimensions of the smaller of the gulfs just mentioned.

Geological research seems to show that Australia is one of the oldest existing land surfaces, and the remarkable character of its fauna and flora as compared with those of other lands is due to this great antiquity.

A peculiar feature in the physical aspect of Australia is the absence of rivers connecting the coast line with the interior, and in keeping with this is the solid outline of the shore generally. From the appearance on the map of the concourse of streams comprised in the Murray and Darling systems, the idea of a well-watered country might be inferred. Many of the tributary streams, however, have running water only after periods of heavy rainfall, and generally fail to reach the main drainage line. The Darling is reckoned amongst the longest rivers in the world, for in certain seasons it is navigable from Walgett to its confluence with the Murray, a distance of 1,758 miles, and thence downward to the sea, a further 587 miles, making a total navigable extent of 2,345 miles. This by no means conveys a true idea of the river, for in dry seasons it can hardly be said to drain its own watershed, and gives water to, rather than receives it from, the surrounding country. In flood-time these rivers spread out over an immense extent of territory, but with the cessation of the rainfall the waters speedily drain off, and the flow is confined to the river beds. Another system of inland drainage comprises the streams which terminate in Lake Eyre, in South Australia. These include all the channels which lead south from the northern watershed, and from the MacDonnell Range, an isolated mass of eruptive granite in the centre of the continent. Such are the Barcoo, Thomson, Diamantina, Cooper's Creek, and several others. They are all absorbed in the saline swamp of Lake Eyre, and some of them, in dry periods, do not reach so far, but sink their scanty contents into the sands.

A large portion of the southern district of West Australia, and part of the western district of South Australia, is destitute of running streams. Indeed over a considerable extent of the coast line in the Great Australian Bight there is no break in the continuity of the bare and precipitous cliffs. Inland from the Bight the aspect is sterile and forbidding, but here and there patches of good country may be found, needing only the presence of permanent water to make them fit for occupation.

In the western half of Australia there are no river systems except upon the coast, and the desert indications begin on the crest of the

table-land. In the Kimberley district there are some fine streams which penetrate some distance inland, but this portion of the continent has yet to be thoroughly explored.

The absence of lakes of any considerable size or permanence is another characteristic of the physical features of Australia. As marked on some maps, the inland lakes of South Australia appear to possess a considerable size, but they are mostly shallow salt marshes, their area depending entirely on the rainfall. Lake Eyre is 39 feet below sea-level, and although in the wet seasons it receives a vast volume of water, it shrinks in periods of drought into a mere salt bog. Lake Torrens is 100 feet above sea-level, and lies between Lake Eyre and the sea. Lake Amadeus is a salt marsh in the interior of the continent, which receives the western drainage of the MacDonnell Range. Much of the drainage received by these lakes passes off by evaporation, but a large volume sinks into the earth, finding its way to the sea by subterranean channels, or else helping to swell the store of artesian water in the reservoirs hidden deep below the surface of the soil.

It will not be necessary here to refer further to the physical features of the country, as these are described with some detail in the following pages dealing with the characteristics of the various states.