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# Chapter 7

## Australasia

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Three large islands east of Timor Trough and Aru Basin constitute Asia's farthest region of Australasia. Australia, its main bulk, can be described as the world's largest island and smallest continent. The other two island groups are New Guinea in the north and New Zealand in the south-east. Australia and New Guinea are only separated by the shallow Arafura Sea but present a contrast in geological structure. Australia is mostly founded on Precambrian stable shield related to Gondwana land. New Guinea, on the other hand, has east-west axes of Tertiary folding. New Zealand is similarly built on a folded structure but aligned south-west/north-east (Figure 8 and Annex F).

### 7.1 New Guinea

The island of New Guinea is comprised of the Indonesian Province of Irian Jaya and the independent country of Papua New Guinea. Their boundary along 142° east longitude bisects the island virtually into two equal halves. However, the Central Cordillera, extending east-west over 2,500 km as the central spine, provides physiographic unity to the island. Indeed, they are the highest mountain ranges between the Himalayas and the Andes with an average tree line of from 3,750 - 3,900m. The Central Cordillera has narrow crested ridges above montane basins enriched by volcanic depositions of laharic material and ash (Brookfield

and Allen 1988). The prominent peaks are the Puncak Jaya (Mt. Victory at 5,029m) in the west and Mount Wilhelm (4,697m) in the east. The former, originally called Mount Carstenz after a Dutch navigator, is high enough to support some small glaciers. The western section in Indonesia, Pegunungan Maoke, has three other peaks over 4,500m in elevation. The eastern section in Papua New Guinea extends from Thurnwald through the Bismarck to Owen Stanley Ranges in the extreme east. As a general pattern, the highlands have the steepest slopes towards the south. Along the northern coast are a chain of lower ranges that trend parallel to the main range. These are the Van Rees in the west, Torricelli in the middle, and Finisterre in the east. The main highlands are composed of Archaean schists and massive crystallines with lava effusives in the central part. These rock formations are rich in minerals—including gold.

The highland terrain is very rugged. The lower slopes are covered with dense tropical forests while grasslands prevail on the higher ranges above 3,000m. The highlands are inhabited by scattered tribes of the Papuan type, some of whom continue their primitive ways. The earliest settlers were centred around swamplands with taro and pork as basic foods. Subsequently, these 'sedentarised' swamplanders expanded into adjoining dry land for swidden cultivation (Gorecki



Figure 8: Australasia

1986). They were followed by the Melanesian people, mainly along the coast. The economy is based on subsistence horticulture<sup>1</sup> and pig husbandry. The main crop is the sweet potato (*Ipomea batatas*) which was introduced in the 17th century. Forest land is cleared by fire and used for garden cultivation of various root crops. The upper limit of crop cultivation is about 2,500m with cultivation on slopes ranging from 30 to 40 degrees. These slopes are never terraced or irrigated (Humphreys and Brookfield 1991). Cultivation techniques based on indigenous knowledge seem well-adapted to fertility management (Sillitoe 1998). This has resulted in comparatively dense settlement at elevations between 1,500 - 2,500 m; one of the advantages of the sweet potato being its tolerance to low temperatures and the fact that its yield is two to six times higher than that of the taro (Smith 1985). Currently, timber extraction and mining are the main economic activities.

## 7.2 Australia

Australia is the lowest and flattest of the continents and has no high mountains despite its vast

extent. Approximately three-quarters of its area is covered by a plateau that rarely rises above 500m. The Great Western Plateau is mostly desert or semi-arid scrub country. The few uplands occurring there are mere pimples on the extensive peneplain. The ancient shield topography is missing only in the east where a chain of low ranges runs parallel to the coastline. The western uplands include the Hamersley Range in the north and the Stirling Range in the extreme south. The Hamersley and its eastern extension, the Ophthalmia Range, are aligned east-west with Mount Bruce (1,235m) being the high point. The rocks are mainly Palaeozoic crystallines. The climate is subtropical with summer rain. The Stirling Range near the south coast is a small lava outcrop capped by Bluff Knoll (1,167m). This area has a temperate climate favoured with winter rainfall.

The central uplands are ringed by deserts in all four directions. These are all low hills with a predominantly north-east strike. The Macdonnell Ranges in the north and Musgrave Ranges in the south enclose the dry lake of Amadeus. Much of these upland areas are designated as Abo-



18. Kangaroo, Australia – Kangaroos in eucalyptus forest near Flinders Range. This marsupial of the family *Macropodidae* is native to Australia and nearby islands.

<sup>1</sup> The use of horticulture here refers to the cultivation of fruit and vegetables on small holdings for subsistence and not to gardening in the decorative sense.

original Reserves and there are seven in all. The only range in South Australia, Flinders' Range, trends north-south along a structural fault fronting Spencer Gulf near Adelaide (Plate 18). The highest point is St. Mary Peak (1,165m). The nearby uplands, known as Barrier Range to the east and Gawler Range to the west, are merely low knolls approaching 500m. These are of much-eroded Palaeozoic rock formations with ridges of hard quartzite.

The Great Dividing Range extends over 3,200 km from Cape York Peninsula in the north to Bass Strait in the south. It is an eroded plateau ranging from 900 to 1,500m. The highest point, Mt. Kosciusko (2,230m), in the extreme south, was named in 1840 after Thaddeus Kosciusko, a Polish revolutionary. The topography is subdued with rolling hills. The island of Tasmania has some small mountains. The main range lies west of the Great Lake and has a number of peaks. The highest peak, Legges Tor (1,573m), is an outlier far to the east. Despite their low elevation, these mountains are considered to be of great interest owing to their luxuriant native flora. Thus, the

small island has four national parks centred around the highlands.

### 7.3 New Zealand

New Zealand forms part of the 'rim of fire' as a surface impression of the boundary between tectonic plates. The mountains of New Zealand extend throughout the length of the two islands as their spine. In terms of geological origin, those in the North Island are younger than those in the South Island. The northern ones are mostly hilly and dominated by four volcanic cones. Maori legends describe the ranges as a great fish brought to the surface by a magic fish-hook; great swellings arose where it was clubbed by the gods who caught it, and the active volcanoes are the death twitches of the giant (Lowe 1969, p 155). This Fish of Maui is associated with North Island as its tail, Lake Taupo as its heart, and the Wellington area as its head.

The mountains of North Island extend nearly 500km north-east/south-west, commencing from Raukumara overlooking the East Cape to Cook



19. Native vegetation, New Zealand. Protected forest north of Wellington. North Island. The mixed forest of broadleaf in the foreground and conifer along the ridge are both of evergreen species.

Strait. It is connected with Huiaru further south which joins the central plateau with the highest peak, Ruapehu (2,797m). Nearby are two more volcanic peaks, Ngauruhoe (2,291m) and Tongariro (1,968m), which overlook the warm lake of Taupo which is surrounded by ice. Several ranges diverge from the plateau to the north and south. Ruahine Range descends further south to merge with Tararua Range. The climate is marine temperate with rain in all seasons and higher precipitation (over 1,500mm mean annual) in the highlands. The surface configuration is one of steep slopes and vegetation is basically deciduous forest (Plate 19). The indigenous people are Maori of Polynesian origin.

Mountain ranges traverse the entire 800 km length of South Island as its backbone. There are 223 named peaks that exceed 2,300m in elevation. The central and highest section between Arthur's Pass and Haast Pass is referred to as the Southern Alps. Northwards, there are many ranges with average elevations of 2,000m with their highest elevations fronting the east coast. The central section with Mt. Cook (3,764m) has many peaks exceeding 2,500m. It has numerous glaciers,

Tasman Glacier in the Mount Cook National Park being nearly 30 km long. Since the Southern Alps are generally steepest on the western side, the longer glaciers are in the east where there are gentler slopes. In the west, glaciers descend more rapidly approaching the rain forest along the coast. The southern section of the range is more splayed-out and contributes to a broken topography. The prevailing winds that sweep across the Pacific bring abundant rain and snow. The snow-line varies from 100m in winter to 1,800m in summer. Natural vegetation is of broad-leaved deciduous species in the west and is a mixture of broad-leaved and needle-leaved evergreens in the east. Over 90 per cent of alpine plants are endemic. The landscape has undergone two diverse impacts. First, Polynesian migration marked the commencement of the destruction of montane forests by fire. Then followed exploitative pastoralism throughout the tussock grasslands and mountain lands of the interior when European colonisation began in the mid-1850s (O'Connor 1984). South Island was unique in having only wild bird life. Now all types of animals have been introduced and have become pests in this pristine land.



(See Figure 8)

<b>Annex F : Ranges of Australasia</b>			
S.N.	Range (Subsidiary)	Prominent Peak (Metres)	Location
1.	Australian Alps	Mt. Kosciusko (2,230)	Australia
2.	Central Cordillera	Mt. Wilhelm (4,697)	Papua New Guinea
3.	Flinders Range	Mt. Mary Peak (1,165)	Australia
4.	Great Dividing Range	Round Mountain (1,608)	Australia
5.	Hamersley Range	Mt. Bruce (1,235)	Australia
6.	Macdonell Range	Mt. Zail (1,510)	Australia
7.	Musgrove Range	Mt. Woodroffe (1,440)	Australia
8.	Pegunungan Maoke	Puncak Jaya (5,039)	Indonesia
9.	Ruahine Range	Mt. Ruapehu (2,797)	New Zealand
10.	Southern Alps	Mt. Cook (3,764)	New Zealand
11.	Stirling Range	Bluff Knoll (1,110)	Australia
12.	Tasmania	Legges Tor (1,573)	Australia

