

PART 1

THE SOUTHERN OCEAN FROM ITS BEGINNINGS TILL NOW

'The surface of the earth binds geography and geology together in an indissoluble union rather like that of man and wife. Geography, like a prudent woman, has taken to herself an 'elder than herself', (though)... she does not flaunt the assertion that she is a woman with a past.'

Geologist Charles Lapworth

The first three chapters provide the backdrop – an account of the origins and evolution of the Southern Ocean, as Australia drifted north, and the large-scale patterns that give the 'unique south' its present character. The unique features of the southern Australian flora and fauna – its high endemism, and species richness – can only be understood when we are made aware of the geology of the Australian continental plate, as described in Chapter 1. The plate has enjoyed

a long period of stability with only minor vertical earth movements, as Australia broke free from Antarctica and drifted northwards. However, sea level has gone up and down with the alternate freezing and melting of polar ice caps, creating gulfs, bays and peninsulas.

The long isolation and stability of the southern Australian region, with the longest stretch of an east-west coast in the Southern Hemisphere, the temperate climate and the topographic complexity of the coastline, have created a vast range of habitats. The ocean currents that have washed its shores for 70 million years, the tidal currents and the variable wave climate have all played a role in further diversifying a bewildering complexity of habitats (Chapter 2). Together these factors have contributed in a variety of ways to the evolution and diversification of a rich marine flora and fauna, as described in Chapter 3.