

Formations of Rock

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Rocks and stones are as much a part of our local, national and global environment as plants, animals, lakes and the oceans. Many people think of rocks as being all the same: static, grey and cold, but nothing could be further from the truth. All of Aotearoa's beautiful natural landscapes and landmarks are shaped from rock. All have stories to tell—of ancient lands, journeys, events and climates, of catastrophe and quiescence, of birth, life and death. They have been, and always will be, used by us humans in our built and social environments. Art and geology are closely connected: clay, stone, metals and many glazes and pigments all come out of the ground. Mountains, hills, rivers and coasts are a perennial source of creative inspiration.

We are lucky in the Ōtepoti Dunedin area to have so many different local rocks. The oldest rock, the geological foundation of the area, is Otago Schist, with its distinctive crumpled layers of white quartz and glittery grey mica. The best place to see schist close to Ōtepoti is on the rocky beaches at Brighton and Taieri Mouth. The iconic

rock tors and mountains of Central Otago are also made of schist. The Otago Schist is our direct connection with the supercontinent of Gondwana. When schist is broken and eroded by moving water, pebbles of hard, white quartz are left behind—for example in the Taieri River at Outram Glen.

The magnificent yellow sandstone cliffs of Tunnel Beach and Waikouaiti are worth experiencing. The sandstone was laid down as sand in a shallow sea that covered our own continent, Te Riu-a-Māui Zealandia, after its tectonic split from Gondwana and during its journey north from the South Pole to warmer climates. The widespread marine rocks tell us that even more of Te Riu-a-Māui Zealandia was submerged and hidden than is the case today; they have since been lifted up out of the sea to form the land.

Most locals know that Ōtepoti is built on an extinct volcano. Hard, tough lava is the most common rock around—black basalt and grey phonolite lavas are exposed on hilltops, in cliffs and as boulders on beaches and in the Water of Leith/Ōwheo. The volcano



has been extinct and eroded for at least 10 million years, so the original volcano shape is long gone but its hard lava flows and plugs still hold up the high points around town e.g. Blackhead, Flagstaff, Mt Cargill, Signal Hill and the Otago Peninsula.

Fresh rocks are usually grey or green in colour, but exposure to the atmosphere leads to eye-catching red, yellow, orange and brown colours caused by weathering and oxidation. The last thing to note about rocks is that humans leave their own artificial materials on beaches, such as corroding metal, bottle glass, broken bricks and concrete. These mix with boulders, sand and mud and, one day, will become rocks: the ultimate recycling process.