

# Treasures on the Tide Line

## Shells and Pebbles of the Coast

The surf of the Hunter's magnificent beaches washes up interesting natural treasures onto the sand: remains of animals, plants and pretty coloured pebbles. They become stranded along the tide line as the waves recede. The southern part of Stockton Beach and the northern part of Burwood Beach are particularly rich in natural treasures.

Pounding surf and the scouring effects of currents and high spring tides dislodge many creatures from their habitat and cast them up onto the beach. Remains of organisms washed up by the waves give us clues to the kinds of animals and plants that are living in the beach sand, on adjacent wave cut rock platforms, and below the water line.

### SHELLS

Many beautiful shells can be found. Shells are the hard outside skeletons of invertebrate animals. The most abundant shells found are those of molluscs: gastropods and bivalves. They are made of calcium carbonate. Whole shells and broken shells occur.

Gastropods have one-piece shells, some coiled into a spiral (sea snails). Gastropods found along the beaches include: variegated tun, wavy volute, auger shell, southern mud creeper, banded kelp shell, Spengler's rock whelk, turban shell, cart-rut shell, zebra top shell, black nerite, mulberry whelk, striped-mouth conniwink, large sand snail, tubercled noddwink, limpet, elephant snail, violet snail, abalone.

Bivalves have two-piece shells, joined by a tough ligament on one side. When the creature dies the internal muscles that hold the valves together relax and the two valves open out. Wave action breaks the ligament so that the valves separate, forming

two shells. Bivalves found along the beaches include: pipi, trough shell, bitter sweet clam, scallop (king scallop and gay fan shell), cockle, mussel, native flat (mud) oyster, Sydney rock oyster, finger oyster (razor shell), shining wedge shell, wedge clam.

The shell photographs identify the local habitat of each mollusc.

### PEBBLES

The cliffs and rock platforms of the Hunter coast are made of sedimentary rocks of the Newcastle Coal Measures. They comprise layers of sandstone, shale, conglomerate, tuff and coal that were deposited in the Late Permian Period, 250 million years ago.

Pebbles of various colours and rock types are washed up onto beaches adjacent to rocky outcrops. The pebbles are pieces of rock that have been eroded from the sedimentary rock layers. Tumbling about in the surf for a while has made them smaller, rounded and smooth.

The pebble photographs give the origin of each rock type.

### OTHER TREASURES

Other remains include: bluebottle, fish, Port Jackson shark egg case, shark's tooth, sea urchin case and spine, cuttlefish spine, sponge skeleton, crab, barnacle, cunjevoi, sea-tulip, galeolaria, seaweed, mangrove seed, driftwood, feathers.

### PEBBLES



**Petrified Wood**  
Rock platform and cliff, fossil tree fragment from sandstone and shale



**Black Coal**  
Rock platform and cliff



**Tuff**  
Cliff, silicified tuff (consolidated volcanic ash) from Nobbys Tuff



**Baked Shale**  
Cliff, heat-affected shale



**Porphyritic Volcanics**  
Cliff and rock platform, pre-existing pebbles from conglomerate and sandstone



**Chert**  
Cliff and rock platform, pre-existing pebbles from conglomerate and sandstone



**Limonite**  
Rock platform, secondary mineral in joints

## GASTROPOD SHELLS



Variegated Tun  
*Tonna variegata*  
Sandy beach, subtidal



Wavy Volute  
*Amoria undulata*  
Sandy beach, subtidal



Auger Shell  
*Terebra*  
Sandy beach, intertidal



Southern Mud Creeper  
*Velacumantus australis*  
Sandy beach, intertidal



Banded Kelp Shell  
*Bankivia fasciata*  
On kelp, subtidal



Spengler's Rock Whelk  
*Cabestana spengleri*  
Rock platform



Green Warrener  
*Turbo undulata*  
Rock platform



Cart-rut Shell  
*Dicathais orbita*  
Rock platform

## GASTROPOD SHELLS



Zebra Top Shell  
*Austrocochlea porcata*  
Rock platform



Black Nerite  
*Nerita atramentosa*  
Rock platform



Mulberry Whelk  
*Morula marginalba*  
Rock platform



Striped-mouth Conniwink  
*Bembicium nanum*  
Rock platform



Limpets  
Rock platform



Elephant Snail  
*Scutus antipodes*  
Rock platform

## OTHER SHELLS



Barnacle  
Rock platform

## BIVALVE SHELLS



Pipi  
*Donax deltoides*  
Sandy beach,  
intertidal & subtidal



Trough Shell  
*Maetra rufescens*  
Sandy beach, subtidal



Bittersweet Clam  
*Glycymerididae* family  
Sandy beach, offshore



Scallop  
*Pecten fumata*  
Offshore



Cockle  
*Anadara trapezia*  
Estuary, intertidal  
& subtidal



Hairy Mussel  
*Mytilus edulus planulatus*  
Rocks & jetty piles,  
intertidal & subtidal



Native Flat Oyster  
*Ostrea angasi*  
Intertidal & subtidal

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