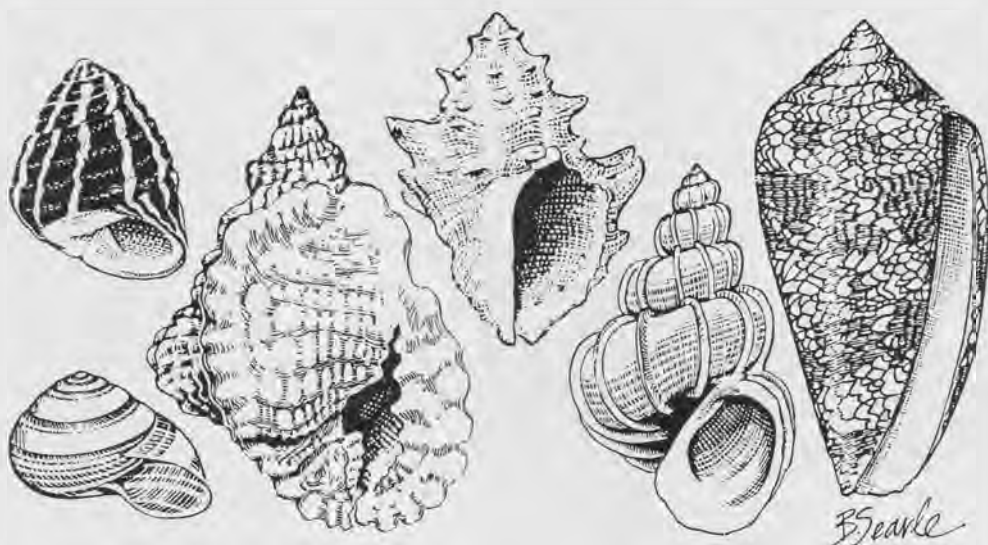


PART III

NATURAL HISTORY



"SHELL COLLAGE"

by

Bronwyn Searle, 1991

Gastropods, or snail shells, are one of the five classes of molluscs found in Moreton Bay. Some are vegetarians, living happily on algae and marine fungi in the shallow waters. Others, like the cone shell at right, are deadly carnivores, killing worms and small fish with poison darts.

Almost all species of molluscs have their operculum, or "opening", on the right if one orientates the shell with the apex pointing away from the viewer – a mystery of design which is but one fascination of these beautiful creatures.

Illustrations by courtesy of Bronwyn Searle and the Queensland Museum, with acknowledgements.



***Precious Habitats:** Coochiemudlo Island contains four distinct habitats, each one precious to the rich ecosystem on this tiny Island. These four quite separate environments are – the high, western, red-soil volcanic western aspect which is geologically very old; the flat post-estuarine sandy-loam eastern half of the Island, which is the ‘newcomer’ of some eight millennia only; the mangrove forests of the western inter-tidal flats; and the Teatree (*Melaleuca quinquenervia*) swamps.*

The swamps provided much of the vegetable foods for Aboriginal forebears and are at the base of many of the fragile foodchains for birds and reptiles and mammals today.

This photograph shows a patch of the ‘Blechnum’ fern, called ‘bungwall’ by the Aborigines of the Moreton Bay region. Its roots were washed, pounded and roasted to remove toxins, and the flour-like residue used as a farinaceous staple in the diet, much as bread or rice is used today.

At left is Dr Pamela Watson, anthropologist and Island resident and an authority on ethno botany. Photo, March 1989, near the southern corner of Elizabeth Street and Victoria Parade, by John Pearn.

THE BOTANY OF COOCHIEMUDLO

Margaret Walker



he vegetation of Coochiemudlo Island is rich and diverse and comprises more than a hundred genera of native herbs, vines, shrubs and trees. The Island covers an area of some one hundred and thirty hectares. The soil types range from almost pure sand at the eastern end to red volcanic through to sandy loam at the western extremity.

Southern Aspect

The southern aspect of the Island, that seen first by the majority of visitors, has white sandy beaches with a red volcanic bank towards the western end. The western shoreline is protected by a dense mangrove forest, and the north and eastern shores comprise sandy beaches. The Island is slightly undulating, with the highest point towards the north-western end. A swampland area, with permanent fresh water near its centre, is in the Government Reserve No. 2117, an area of 19.5 hectares. This important wetland habitat extends from the northern end of Elizabeth Street through to a creek outlet on the eastern shore.

A diverse flora grows above the tidal mark on the southern beach (Main Beach), especially on the less frequented south-western aspect past the red cliffs. Grasses, creepers which include the *Ipomoea pes-caprae* (sub sp. *Brasiliensis*) with its large leaves and pink flowers and *Carpobrotus glaucescens*, also called Pigface grow there. There also are *Dianella* and the blue flowered *Wahlenbergia*, which is widespread. The small shrub *Myoporum acuminatum* — 'boobialla', with its minute white flowers which form into pale purple fruits — is also there.

The sky line on the high western aspect is dominated by the tall Norfolk Pines (*Araucaria heterophylla* syn. *A. excelsa*), an introduced species.





The Botany of Coochiemudlo: The native Wombat Berry, 'Eustrephus latifolius', grows prolifically on the Island. This twining herb is low-growing and often grows as a polymorphic vine-like plant on other herbs. It bears orange-coloured fruit which germinate easily in cultivation. Photo, at Morwong Beach, January 1990, by John Pearn.



The Botany of Coochiemudlo:

The White Cypress or Dune Cypress, 'Callitris columellaris', is native to the Island; and in pre-Settlement times formed dense, deep green stands of tall timber.

The cypress forests of the Island were extensively logged in the nineteenth and early twentieth centuries.

Some regrowth has now occurred in Council reserves.

Photo, northern end of Norfolk Beach, near the sea, 1989, by John Pearn.



The Botany of Coochiemudlo:

A beautiful 'Angophora costata', the Smooth-barked Apple Gum or Rusty Gum, in Nama Street, Coochiemudlo Island.



Eucalypts and Angophoras are common in both the red soil and sandy parts of the Island.

Angophoras differ from Eucalypts in not having a lid (or operculum) on the 'gum-nuts.'

The Coochiemudlo Angophoras shed their bark to reveal smooth trunks of the most brilliant russet-brown colour.

Photo, January 1988, by John Pearn.



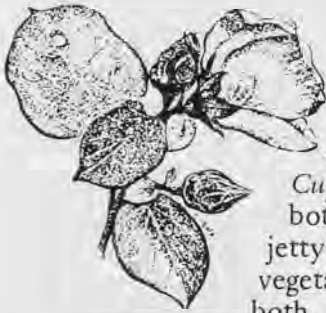


The Botany of Coochiemudlo: The Large-fruited Orange Mangrove, 'Bruguiera gymnorhiza', growing in the intertidal zone at the western end of Morwong Beach.

The cigar-shaped green pendulous fruit are capped with an orange-red calyx. When ripe they fall into the water, or spear into the mud where germination occurs.

This is one of the six different species of Mangrove occurring on the Island.

Photo, January 1993, by John Pearn.



The red soil supports *Banksia integrifolia* (Coastal Banksia), and the Cypresses, *Callitris columellaris*, obvious by their bright green foliage. The odd *Hibiscus tiliaceus* (Cottonwood) and the occasional *Acacia aulacocarpa* grow among the dominant Eucalypts. *Cupaniopsis anacardioides*, the Tuckeroo, which grows in both sandy and the red soil, is also common. At the jetty-end of this southern aspect of the Island, the natural vegetation understory has all but disappeared due to traffic, both pedestrian and automobile. The Sheoak, *Casuarina equisetifolia* hangs its soft grey foliage over the beach, like the drooping feathers of a cassowary, from which resemblance the tree derives its name.

Western Aspect

Off the western shore is an extensive mangrove woodland containing six species of this valuable tree. There are to be found the *Avicennia marina* var. *australasica* (Grey Mangrove), the *Ceriops tagal* var. *australia* (Yellow-leaved Spurred Mangrove), the *Excoecaria agallocha* (Milky Mangrove), the *Aegiceras corniculatum* (River Mangrove), the *Rhizophora stylosa* (Red Mangrove) and the *Bruguiera gymnorhiza* (Orange Mangrove), which form important parts of the habitats which sustain fish and crabs in Moreton Bay. These mangroves are also a haven for a number of birds which include the Mangrove Honeyeater, the Ibis, the White-faced Heron, and the Kites. The *Bruguiera* is host to the orchid, *Dendrobium monophyllum* and the (as yet to be confirmed) tiny epiphytic orchid, *Bulbophyllum minutissimum*.





The Botany of Coochiemudlo: Mangroves are very important indeed in the food-chain ecosystems of Moreton Bay.

An extensive mangrove forest persists on the western side of Coochiemudlo Island, the home of countless crabs, fish, molluscs and birds.

This scene, at full tide, shows a small 'inlet' in the mangrove forest at the western end of Morwong Beach, looking north to Peel Island on the horizon.

The large mangrove with the thick trunk at left is 'Avicennia marina', the White Mangrove, which is the most widespread and common of the seven species found in Moreton Bay.

Photo, January 1992, by John Pearn.



The plant community behind the mangroves is very diverse, ranging from *Enchylaena tomentosa*, the Barrier Saltbush, and an impressive stand of *Acrostichum speciosum* (Mangrove Fern) in the tidal zone. There also are the tall Eucalypts; and *Melaleuca quinquenervia*, the host to the Teatree Orchid, *Dendrobium canaliculatum*. Above the high-tide mark grows *Angophora costata* with its beautiful russet-coloured trunk, seen after the trees have dropped their old bark. On the western aspect, below the road, are to be found *Callitris columellaris*, *Casuarina glauca* which is the host to the parasite mistletoe (*Amyema* sp.), the *Acacia aulacocarpa*, and some fine specimens of *Exocarpos cupressiformis* and *Ex. latifolia* which are widespread on the Island.

A rare plant on the Island, *Erythrina vespertilio* (Coral Batwing), has been observed in this area, not doing very well. Here also is found the small tree, *Rapanea variabilis*, the Muttonwood, another plant quite widespread on the Island; *Psychotria loniceroides* with its soft pale hairy leaves; the orchid *Geodorum* and the vigorous climber *Parsonsia straminea*. The ferns *Blechnum indicum*, *Adiantum hispidulum*, *Schizea bifida*, and *Schizea dichotoma* are part of this community extending through areas of red soil to those covered with sandy loam.



The Botany of Coochiemudlo: Many clumps of the Swamp Lily, '*Crinum* sp', occur near the high-water mark on the Island; and indeed along the shores of Moreton Bay and the rivers which flow into it. This handsome, evergreen and robust lily produces globular shiny green seed-pods which are transported by the tides, and which germinate readily in muddy soil. The beautiful white flowers have red stamens and are perfumed. This clump is growing in sand under the 'Eucalypts' above the high-water mark of Morwong Beach. Photo by John Pearn, April 1988.



The Botany of Coochiemudlo: A dense stand of the Mangrove Fern, 'Acrostichum speciosum', growing at the water's edge in the sheltered mangrove forest on the western side of the Island. This species prefers dappled light and is salt tolerant. It is protected by she-oaks ('Casuarina' sp), shown here, which afford shade. Photo by John Pearn, January 1993.

Northern Aspect

The northern side of the Island has the remnants of a mangrove forest to the western end of Morwong Beach. Near the shoreline grows the *Pandanus* and both species of trees appear again on the eastern end of this beach. Shade and shelter are provided by *Casuarina equisetifolia* and some fine specimens of the Cottontree, *Hibiscus tiliaceus*. The creeper *Canavalia maritima* (Syn. *C. rosea*), a plant which lends itself to sand and beach stabilisation, also grows here. An interesting stand of Native Cherry, *Exocarpos cupressiformis*, is growing at the eastern end where a lone *Sophora tomentosa* displays its medium sized lemon-yellow flowers and its distinctive seed pods.



Eastern Aspect

Ramblers walking to the eastern shore will see the *Banksia integrifolia* appear again, and *Eucalyptus* and *Casuarina* with the small herb *Peperomia leptostachya*. The edge of the swampland, a precious wetland, extends to the shore – this whole wetland area supports vegetation closely related to wallum species and includes the creepers, *Smilax australis*, *Hibbertia scandens* (yellow flowers) and *Kennedia rubicunda* (red flowers); many small plants including *Wahlenbergia*, *Dianella*, *Hibbertias*, *Pimelia linifolia*, *Trachymene incisa* (white flowers), *Burmannia disticha* (purple flowers); and several orchids including the Helmet Orchids, *Corybas fordhamii* and *Corybas aconitiflorus*; and *Geodorum densiflorum*.

Shrubs and small trees include the lovely large yellow-flowered *Gompholobium*, *Dodonaea triquetra* (Hop Bush), *Hakea florulenta* (the Three-nerved Willow Hakea), *Persoonia*, *Eleocharpus reticulatus* (Blueberry Ash), *Banksia robur*, *Melastoma affine* (Native Lasiandra), and *Pulteneas* (yellow flowers). Native Parsley (*Lomatia silaifolia*), *Lomandras*, *Xanthorrhoea* and *Ziera smithii* also form part of the understorey beneath the dense stands of *Melaleuca quinquenervia*, and the Eucalypts which grow in this Reserve near Norfolk Beach. On the Elizabeth Street side of the wetland is a fine specimen of the Queensland Brush Box, *Lophostemon confertus* (Syn. *Tristania conferta*).

In the Norfolk Beach area, *Eucalypts*, *Banksia integrifolia*, and *Callitris columellaris* dominate. The fern *Drynaria rigidula* (Basket Fern) grows in this area.



The Botany of Coochiemudlo: Remnants of the primeval forest persist as tiny residual pockets of lush greenness. This woody vine, 'Parsonsia straminea', the Monkey Rope, was named by Surgeon Robert Brown, the naval surgeon who accompanied Matthew Flinders in the 'Investigator'.

'Parsonsia' honours Dr James Parsons M.D. (1705-1770), a London doctor. These robust woody lianas grow prolifically in the rich red ('Kutchi') soil of the western shore-line of the Island, above the mangroves and beneath the canopy of she-oaks ('Casuarina' sp). Photo by John Pearn, January 1993.



***The Botany of Coochiemudla:** At least five genera of orchids occur on the Island. Orchids are some of the most highly evolved of all members of the plant kingdom and flourish in a great diversity of habitats, many otherwise unforgiving. The scientific name of this ground orchid, the Painted Orchid, is 'Geodorum densiflorum'.*

'Geodorum' means 'a gift of the earth', and bears these densely packed pink flowers. This specimen emerged from a suburban lawn which had been mown continuously for more than a decade. The buried pseudobulb had survived throughout this time, the stem and leaves emerging and surviving decapitation at a time of domestic garden neglect.

Photo at Morwong Beach, January 1993, by John Pearn.



The Botany of Coochiemudlo: The fragile ecosystems of the Moreton Bay islands are easily thrown into imbalance by the overgrowth of introduced weeds and by noxious exotic plants. This photograph shows the rampant growth of three introduced species, now naturalized.

At left is the Painted Spurge, 'Euphorbia cyathophora', with its Poinsettia-like red bracts. At centre is the common Prickly Pear, 'Opuntia stricta', the scourge of children's feet. The Prickly Pear is growing among the almost indestructible 'Bryophyllum tubiflorum', Mother-of-Millions, with its succulent grey-green tubular leaves. This latter weed contains bufadienolide, a toxin related to the poison of the cane toad, a similarly introduced pest. Photo, at Morwong Beach, by John Pearn, 1993.

The Island Centre

The inland area of the Island is being developed rapidly by housing and consequently a great many plant species are being lost. With prudence many of the current species can be preserved — e.g. *Tricoryne elatior* (the yellow Autumn Lily), *Hybanthus enneaspermus*, *Thysanotus tuberosus*, and *Patersonia*. Plants facing extinction on the Island include the Greenhood Orchids, *Pterostylis*, and the epiphytic orchid *Dendrobium linguiforme*, the fern *Blechnum indicum*, the creeper *Hardenbergia violacea*, the twining plants *Eustrephus latifolius* (Wombat berry) and its relative *Geitonoplesium cymosum*, the Scrambling Lily. The trees include the *Acacia aulacocarpa*, *Cupaniopsis anarcardioides*, *Callitris columellaris*, *Casuarina* sp. *Alphitonia excelsa* (Soap Tree or Red Ash), *Glochidion* (possibly *G. ferdinandii*) (Cheese Tree) and of course the beautiful Eucalypts which range over the Island.

Development of the Island has brought the incursion of many unwanted plants, namely 'weeds', which include the Asparagus Plant, Mother of Millions, Ochna, the Umbrella tree (*Schefflera actinophylla*), Painted spurge (*Euphorbia cyathophora*), the succulent Agave, Corky Passion vine (*Passiflora suberosa*), Prickly Pear, Groundsel, Wandering Jew, Cobbler's Pegs (*Bidens pilosa*), Bindy-eye (*Soliva pterosperma*), Mile-a-minute (*Ipomoea catrica*), and a number of grass-like plants. These plants prevent the natural regeneration of the natural species on the Island.

The plants mentioned here are but a few of the species growing on Coochiemudlo. The Island is a great 'outdoor laboratory' for the teaching of amateur naturalists and specialists alike. Its easy access and its diversity of habitats make it one of the most precious botanical resources for the great conurbations of south-east Queensland. Because of this, the diversity and beauty of the Island's flora need to be protected and treasured by us, its residents and visitors, and maintained and nurtured for the benefit of future generations.





The Botany of Coochiemudlo: The predations of humankind can cause havoc on a small, sand island. In its natural state the shore line shows a progression, as one passes from the sea to the interior, of 'Ipomoea', then grasses, then robust herbs which find protection under the littoral Sheoaks ('Casuarina') and Cotton-trees ('Hibiscus tiliaceus') which grow in the sands of beaches of former geological times. Trampling damages this fragile inter-relationship, and the damage is compounded in nitrate-deficient sand. Dune stabilization and rehabilitation are essential to preserve the protective function of the natural vegetation and to prevent erosion.

Photo, December 1991, by John Pearn.



THE SEA AND ITS SHELLS

Frances Connor



urrounding Coochiemudlo Island are waters which provide a diverse selection of sea life, well adapted to the different areas of the marine environment. The shoreline holds interest for all. The shells and other animals which live on the tideline, or are washed up on our beaches, provide a constant source of interest and education for the beachcomber and riches for the amateur naturalist.

In marine geography, Coochiemudlo's sheltered location in Moreton Bay is situated in the narrow overlap zone (between Lat. 25° and 26° South) between northern and southern biota. Here the tropical and subtropical waters of the north, with their colourful shells and corals, meet the temperate waters of southern Queensland and northern New South Wales. In these more southern waters the shoreline fauna is characterised by a less flamboyant, but equally diverse, range of shells adapted to living on intertidal rocks and rubble, on rocky headlands and on beach sands.

The Island's shoreline is marked by variations in habitat, from the mangrove stands of the west and north-west beaches, the rock and coral rubble areas prominent on Morwong Beach and the north-east corner, to the more open, sandy reaches of Norfolk (east) and Main (south) Beaches. Each of these areas has its own characteristic fauna of marine life, adapted to the challenges of the local environment.

Within each area, animals and plants arrange themselves in more or less distinctly defined zones. That part of the marine fringe most accessible for shell collecting and fossicking is termed the Littoral Zone.





The Shells of Coochiemudlo: For centuries men and women have collected and wondered at the shells of the Island, and eaten their contents. The intertidal zone of the sandy beaches and the mudflats are the homes of dozens of living species, and the repository of fine specimens of dead shells. This scene, at the Norfolk-Morwong Beach junction shows a sand beach in the foreground, the oyster covered sandstone beachrock of the middle distance, and the mudflats beyond. Over all towers a White Mangrove, 'Avicennia marina'. Photo, looking east to Pott's Point on Macleay Island, with North Stradbroke Island beyond, January 1993, by John Pearn.



The Littoral Zone includes the beach proper and the sand and mud flats that are exposed at low tide and is characterised by a fauna of marine organisms that have adapted to, or need, alternating exposure to the air and to wetting — by submersion, splashing or spray. The location of organisms within different strata of the littoral zone is dependent on such factors as tolerance for air desiccation and extremes of temperature, by food availability and by the presence of competitors and predators.



The area just below the lowest tide mark is termed the Infralittoral Zone. It is most accessible to the naturalist by wading or snorkelling during very low tides in calm weather. Thus exploring the north-eastern corner of the Island reveals a zone encrusted with hard and soft corals, colourful sponges and seaweeds and a myriad of small crabs, fish and anemones. This area is also a valuable source of shells, which are washed up on the Island's beaches. Any study of the Island's shells is enriched by an acquaintance with each animal's niche in this complex environment — in a sense, a study of its neighbourhood and lifestyle.

Along the Island's fringe, perhaps the most prolific and obvious animals are the molluscs. Of the six Classes in the Phylum Mollusca, four are represented here (the exclusions being the tusk shell, Class Scaphopoda, and Class Monoplacophora, primitive limpet-like animals found only on the sea floor in extremely deep water).

Visitors to the Island come across hundreds of examples of the marine Gastropods (snails) and Bivalves, (or clams). Those fossicking in the intertidal zones might also have discovered spiny chitons clinging to rocks and rubble (members of Class Amphineura), or even sighted the elusive Blue Ringed Octopus, a beautiful (but lethal) representative of the Cephalopod Class.

Mangrove Habitat

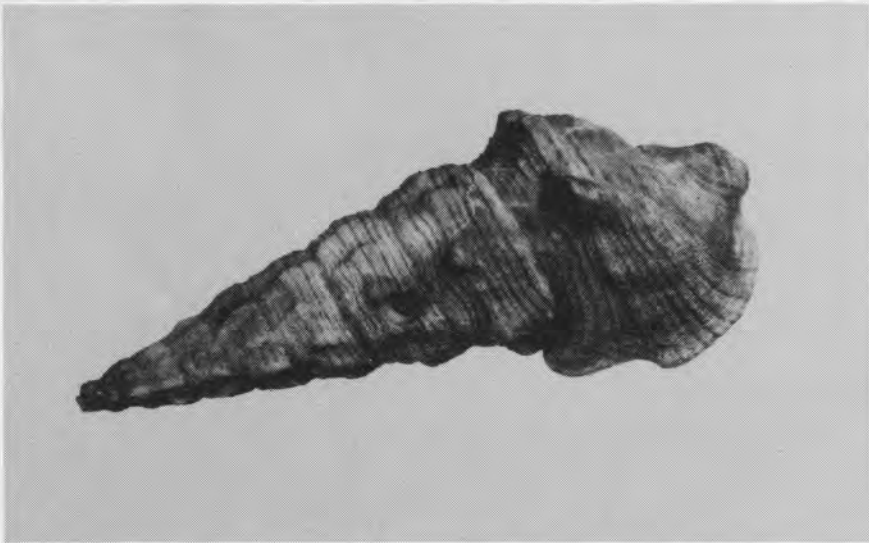
Within the mangrove habitat, several species of marine snails have evolved the ability to breathe in air. An unusual example is the Ear Shell (family Ellobiidae) whose aperture resembles the shape of a human ear. Occasional specimens of the Angular Ear Shell (*Cassidula angulifera*) can be found.

Down among the stumps and branches of the mangroves live a host of shells, including larger specimens such as the Mangrove Murex (*Naquetia capucinus*), which feeds on various worms and boring molluscs inhabiting the dead wood and the mud. Other carnivorous species include the Dog Whelks (family Nassariidae), whose local representative, the Ribbed Dog Whelk (*Nassarius pullus*) feeds on small bivalves. The Dog Whelk uses a

Chronicles of Coochiemudlo

technique of assassination identical to that employed by the Naticids, or Conical Sand Snails (*Conuber conicum*) on the sandy stretches of the Island. Both bore a small hole through the shells of their victims by means of an acid secretion which softens an area of shell. This is followed by a rasping action of their tongue or radula. Later a narrow proboscis is inserted into the tiny hole, and the prey is ingested. In summer, sand snails lay thousands of tiny eggs embedded in a gelatinous sausage shaped mass, many of which are found washed up on the Island's beaches.

Of the mangrove bivalves, many species which live attached to bottom structures or embedded in the mud are quite fleshy and edible (although some species require special preparation before being eaten). Species of interest to the gourmet naturalist include the Mud Ark (*Anadara trapezia*), the beautiful Flavum Heart Cockle (*Acrosterigma flava*), the prolific Hairy Mussel (*Trichomya hirsuta*), and the ubiquitous commercial oyster (*Saccostrea commercialis*). In addition to the various edible clams, gastropods such as the common Hercules Club Shell (*Pyrazus ebeninus*) and the Australian Mud Whelk (*Velacumantus australis*) also provided a valuable food source for Aboriginal forebears on the Island.



The Shells of Coochiemudlo: A beach-collected specimen of the Australian Mud Whelk, 'Velacumantus australis'. These shells were a significant food source for Aboriginal forebears throughout Moreton Bay.

This whelk has been attacked and killed by another gastropod – a carnivorous Sand Snail ('Conuber' sp.) which attaches itself to the victim's shell, secretes acid and then bores a hole to get at the shellfish inside.

Photo, courtesy of Graham Jurrott, with acknowledgements.



The Shells of Coochiemudlo: Many of the sandflats and mudflats which surround the Island support a rich mat of Seagrass, 'Zostera capricorni'. This in turn provides a stable habitat for starfish and molluscs.

This photograph shows the exposed intertidal flat at Morwong Beach, with a stranded starfish and two specimens of the Australian Mud Whelk,

'Velacumantus australis'. Mud whelks occur in their thousands on these banks.

Photo, December 1987, by John Pearn.



The range of mangrove bivalves is enormous. Some of the more unusual species include the White Hammer Oyster (*Malleus albus*), and the Chinese Fingernail shell (*Solen grandis*), whose unusual shapes provide the obvious inspiration for their common names.

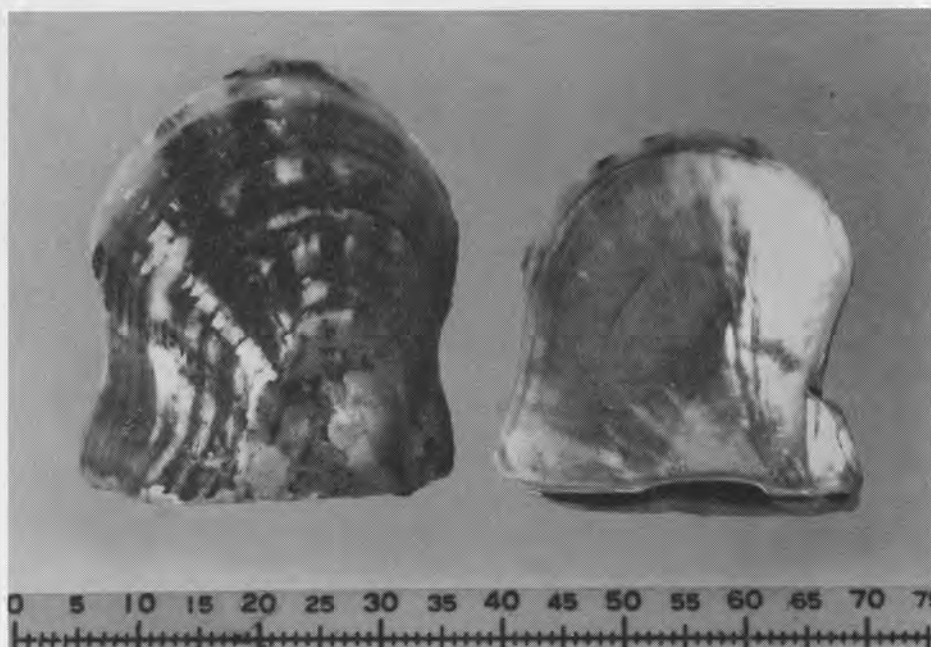
More dangerous members of the Class include the aptly named Razor Clam (*Pinna bicolor*) and the beautiful Long Spined Thorny Oyster (*Spondylus wrightianus*), both of which live partially buried in the sand and mud and constitute an unseen hazard for those walking barefoot on the mudflats.



Rock and Reef Habitat

On the northern shoreline of the Island (Morwong Beach and the north-east corner), mangrove species coexist with animals living among submerged rocks and coral debris.

Small, but colourful gastropods are commonly collected here. Popular species include the black and white Ribbed Periwinkle (*Austrocochlea constricta*), its relative the pink conical Top Shell (*Calliostoma sp.*) and the Striped Mouth Conniwink (*Bembicium namun*), whose black and white stripes rapidly become eroded from the spire, exposing an attractive orange underlayer. Nerites are also abundant. Members of this family are easily recognised by the presence of a characteristic platform-like posterior edge at the aperture. The prolific Chameleon Nerite (*Nerita chamaeleon*) has an endless variety of colours and patterns, ranging from deep red and burnt orange, through paler golds and white, to a deep steel grey, overlaid with fine speckles or splashes of black.



The Shells of Coochiemudlo: Many species of bivalve shells occur on the Island. This specimen is the common Pearl Oyster, 'Pinctada sugillata', found particularly on the sandflats and mudbanks of the north-eastern aspect of the Island. Photo, a dead-collected specimen, courtesy of Mr Graham Jurott.

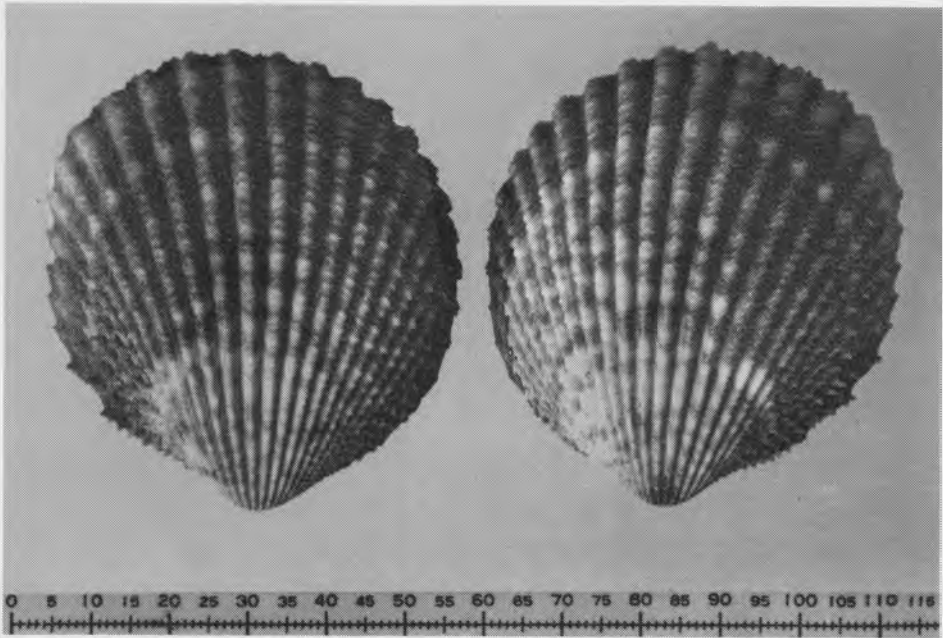
Oysters are also common in this area, and teams of children appropriately armed with hammers, screwdrivers and jam jars are a common sight. Prior to the introduction of such sophisticated technology, generations of indigenous people have shared this natural delicacy, using large hand held rocks to open the shells, and finer quartzite blades to scrape out the rewards. Other natural predators of the oyster such as Hanley's Oyster Drill (*Bedevea hanleyi*) and the Mulberry Shell (*Morula marginalba*) are found in large numbers on the Island and are a continuous menace to commercial oyster growers in Moreton Bay.

Also in this area, although not of commercial value, is the Southern Pearl Shell (*Pinctada fucata*). This shell grows to a size of 8.5 centimetres and is found attached to sea grasses or clumps of dead shells on the mud flats.

Clinging to the rocks and rubble are many species from the Families Acmaeidae and Patellidae, the limpets. Once submerged, these herbivores graze slowly on algae covering the rocks. Local representatives include *Cellana tramoserica* and *Patelloida alticostata*. Juke's Keyhole Limpet (*Diodora jukesi*) is one of the finest examples of its Family (Fissurellidae), having extensive radial fluted ribs as well as concentric buttressing between ribs. The characteristic keyhole-shaped opening at the top of the shell is used for respiration. It allows an influx of fresh water to the gills in the mantle cavity inside the shell, and is a portal for the disposal of waste products on the outgoing stream. Another member of this Family is the Duck-Billed Limpet (*Scutus antipodes*). Although lacking an upper 'keyhole' opening, it has a typical shallow slit or notch at the front which performs a similar function. The animal's body is large, black and sluglike, enclosing the shell. Thus to avoid predators it has become quite manoeuvrable, seeking shelter under large rocks.

One of the most spectacular shells on Coochiemudlo is the Baler Shell, *Melo umbilicatus*. The colourful and highly patterned juveniles of this species are quite commonly found washed up on the shoreline. Not so the adults, which grow to 25 cm long and spend their lives burrowing through the sand using their large meaty foot. These animals are carnivores and consume their prey (generally bivalve species) after first smothering the victims in the voluminous folds of their foot.





The Shells of Coochiemudlo: Cockles are very common on the Island. The shells are beautifully coloured with orange, purple and cream bands, but remain camouflaged by a coating of mucinoid secretion which attracts algal growth. This photo shows the two valves of a Reeve's Cockle, 'Acrosterigma reeveanum', collected on Norfolk Beach, in 1986.



Sand and Rubble Habitat

The Littoral Zone of Norfolk Beach on the eastern side of the Island is characterised by a wide stretch of sand which is exposed to the action of the waves. The infralittoral area here offers some protection and anchorage for molluscs on crumbling submerged sandstone and coral rubble. This area is particularly noted for its bivalves, a number of which are quite decorative.

The unusual and vividly patterned Navicular Ark Shell (*Arca navicularis*) lives attached to the rubble bottom by a fibrous stalk, or byssus, secreted by a special gland near the hinge of the shell. This method of attachment is a common alternative to the calcareous cement secreted by shells such as the oyster, and is shared with other local species such as the Hairy Mussel, which is often found in large fibrous clumps attached to solid objects.

The Sea and its Shells



Various members of the Pectin or scallop family are represented at the northern extremity of the Island's eastern coastline. Large valves of *Chlamys gloriosa*, the Glory Scallop, are frequently washed up from subtidal areas, where they live to depths of up to 40 metres. These 'Fan Shells' vary in colour from bright orange through to deep purple and can be quite spectacular. A close relative, *Chlamys lividus*, the Scaley Scallop, can also be found in hues of gold, orange or red and is distinguished from the Glory Scallop by the presence of delicate scales on the outer surface.



The Shells of Coochiemudlo: A cleaned specimen of Chemnitz's Venus Shell, 'Antigona chemnitzii', collected on Norfolk Beach, in 1986, courtesy of John Pearn.

Chronicles of Coochiemudlo

Other beautiful clam shells of this northern area of Norfolk Beach include Chemnitz's Cockle (*Periglypta chemnitzi*), a member of the Venus Shell Family, Veneridae. This solid white shell is distinguished by its prominent fine horizontal frills. It spends its life deeply buried in the mud, filtering tiny morsels of food from the sea water which it is constantly siphoning into its shell. Jingle Shells (*Anomia descripta*) are also common on Norfolk Beach and are frequently collected for use in home made wind chimes, their brightly coloured, translucent shells producing a fine tinkling sound as they jingle in the wind.

Edible species are also abundant in the area. The best known are the Pipi (*Donax deltoides*) which is also commonly used by fishermen for bait, and the Eugari, which can be boiled to produce a tasty soup.



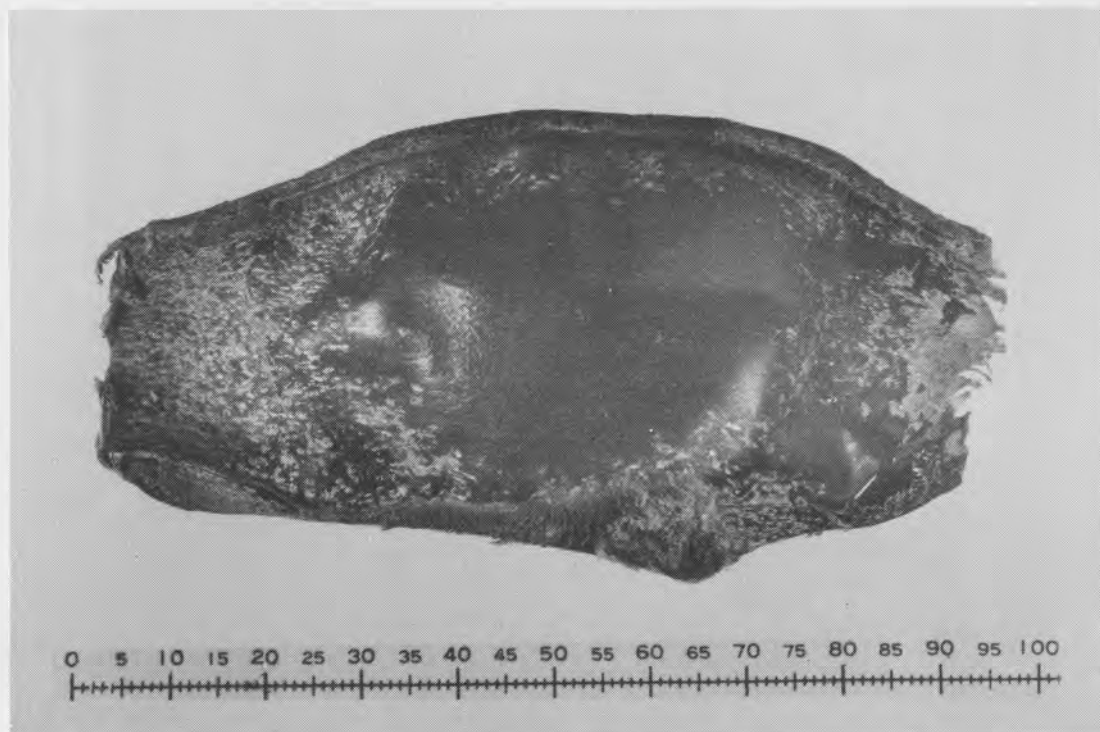
The Seashore: Several species of barnacle occur on the Island, and on the flotsam which strands on its shores at high tide.

Barnacles are not molluscs, but crustaceans belonging to the same zoological Class as crabs and prawns. More than 1000 different species occur worldwide.

This specimen from the north-eastern point of Coochiemudlo is the Giant Rock Barnacle, '*Balanus nigrescens*'.

Photo, 1989, courtesy of Graham Jurrott and John Pearn.





The Beaches of Coochiemudlo: Beachcombing is a wonderful pastime, especially when one is alone and when one has time to search, to examine and to wonder.

Beachcombing is always productive on Coochiemudlo Island after prolonged bad weather. The flotsam and jetsam of the tide wrack contains a miscellany of natural objects from the wondrous kingdom of the deeper sea.

This photograph shows a cast-up egg-case of the Brown-banded Catshark, 'Chiloscyllium punctatum', found in a mass of tangled seaweed on Morwong Beach, after a storm.

Photo, 1989, courtesy of John Pearn and Graham Jurott.





The Shells of Coochiemudlo: In the beach sands of the Island can be discovered myriads of different creatures and found objects.

This photograph (scale in millimetres) shows two such objects from the sands of Morwong Beach. At left is the Dirty Sand Snail, '*Polinices sordidus*', an active gastropod which lives on minute algae and detritus in the lower intertidal zone. At right is the bony otolith (the ear stone) from the Fork-tailed Catfish, '*Arius graeffei*'.

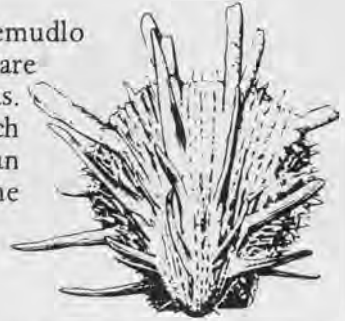
Courtesy of John Pearn and
The Queensland Museum.



The Sea and its Shells

Itinerants

In addition to the shells native to Coochiemudlo and its environs, occasionally shells drift in or are washed on to the Island from more distant areas. In this way battered representatives of such diverse groups as the Cowrie, Tun and Turban Shell Families are sometimes seen, reflecting the proximity of the Moreton Bay islands to the warmer seas of the north.

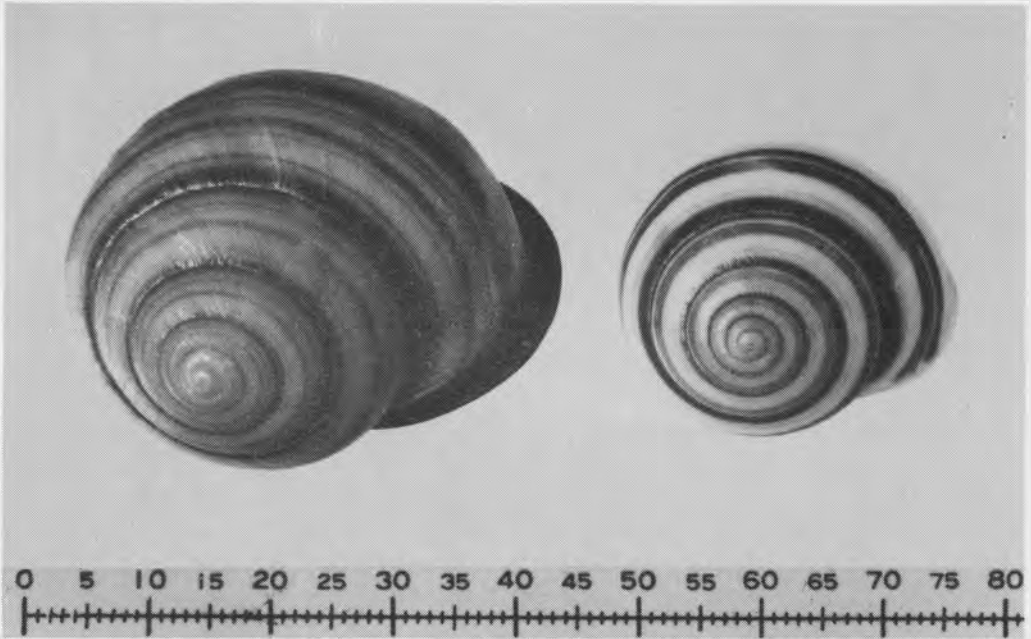


It is a cruel and wasteful thing to collect *live* shells. Good dead specimens are there for the collector and the student of the shoreline. At the height of summer, some two thousand visitors now land on Coochiemudlo Island, each weekend. If even a small proportion of those visitors collected live shells, the fragile ecosystems of the beaches and rocks would be ruined and all would be the poorer. Marvel at these beautiful things of Nature, and respect them. Look underneath rocks and detritus, but turn the rocks back lest, by one's oversight, a thousand creatures needlessly perish.

The shells of Coochiemudlo Island represent a rich and heterogeneous population, drawn from several distinctive but overlapping marine habitats, all existing within a relatively small geographical area. The shores of the Island are a paradise for the collector, the calcareous remnants of the many bivalves and gastropods acting as natural souvenirs of times spent walking the beaches of this precious Island.



Chronicles of Coochiemudlo



The Shells of Coochiemudlo: Molluscs live in the seas, on the beaches, on the trunks and leaves of mangroves and on the land in the centre of the Island.

These two specimens of Land Snails were collected under rotting vegetation in a domestic garden facing Morwong Beach.

At left is Fraser's Land Snail, 'Sphaerospina fraseri'; at right is the Dainty Land Snail, 'Sphaerospina mattea'.

Specimens and photograph, 1989, courtesy of John Pearn and Graham Jurrott.

