

> 360KM SOUTH OF JAVA AS THE CROW FLIES AND 1400KM NORTHWEST OF AUSTRALIA, THIS SPECK OF LAND IN THE MIDDLE OF THE INDIAN OCEAN IS THE TOP OF AN UNDERSEA VOLCANO FORMED 60 MILLION YEARS AGO IN EOCENE TIMES. LAYERS OF BASALTIC LAVA WERE LATER TOPPED BY LIMESTONE DEPOSITS. ONCE THE ORIGINAL ISLAND SUBSIDED, AN ATOLL WAS CREATED, WHICH IN TURN SANK 20 MILLION YEARS AGO, THE CLASSIC DARWINIAN THEORY. MORE CORAL DEPOSITS OCCURRED DURING THE MIOCENE ERA. A SERIES OF UPLIFTS ROCKED THE ISLAND, AS THE INDO-AUSTRALIAN PLATE MOVED NORTH TOWARDS THE ASIAN PLATE. OCEANIC EROSION CARVED SEA CLIFFS INTO THE 80KM COASTLINE, CREATING THE DISTINCTIVE SHORE TERRACES SEEN TODAY.

: PIERRE CONSTANT

**A**bove water for only one to two million years, Christmas Island has moved 700km north from its original position and continues to do so at a rate of six centimetres a year. Eventually, two to three million years from now, it will plunge into the 6000m deep Java Trench, 140km north.

Ocean currents here are influenced by the two clearly marked global seasonal patterns of the Indian Ocean. The May to December dry season brings currents running southeast to northwest and is triggered by the southeast trade winds of 15-20 knots. The wet season, during December to April, has predominantly northwest trade winds and 2000mm rainfall and the current runs west to east. Originating from Antarctica, a nutrient rich 'upwelling' hits Christmas. The Abbott's booby – an oceanic seabird with long narrow wings – has timed its 15-18 months breeding cycle so the early feeding of new chicks coincides with the occurrence of the upwelling. The Indonesian archipelago is the nearest source of colonists for Christmas. Winds and storms associated with the NW monsoon are the main avenue for birds and insects. Eight species of seabirds nest on the island: the 'Golden Bosun' or whitetail tropicbird; the 'Silver Bosun' or redtail tropic bird, the Brown booby, the red footed booby, the Abbott's booby, the Great frigatebird, the Christmas Is. frigate, and the Brown noddie. Nesting on emergent trees in the forest canopy, Abbott's booby and the Christmas Is. frigate are both endemic to Christmas. 70% of the land birds are also unique to Christmas: an emerald dove, a pigeon, a white eye, a thrush, a hawk owl, a goshawk, a glossy swiftlet. Five species of reptiles are also represented, including two tiny blind snakes, a giant gecko, a blue tail skink, three endemic mammals and two endemic crabs (Red and Jackson's).

With a maximum elevation of 360m, the core Central Plateau is made of shallow valleys and low hills with ridges of coralline limestone. At one time a lagoon here became a brackish swamp

# THE EVOLVING

# ISLAND



with mollusks, algae and fish, some of which are now found as fossils. The phosphate deposits originate from the marine organisms that died when the island uplifted, not from bird guano.

The extensive cave system on Christmas results from earthquakes fracturing the limestone formations. Underground streams have shaped stalactites, stalagmites, shawls and terrace pools. Springs emanate at the interface between basalt layers and overlying permeable limestone strata. Hosnie Springs on the east coast and the Dales on the west both have perennial streams. An Indo-Pacific freshwater eel species *Anguilla marmorata* has even been discovered at The Dales. Hugh's Dale has a waterfall with charming terrace pools and beautiful carbonated formations stained red by iron oxide. Anderson Dale ends with a mesmerizing canyon with fantastic strangling figs and vines flowing down the bedrock. Endemic spiny-leaved pandanus trees crest the cliff. Both creeks host the giant Tahitian water chestnut, with impressive buttress roots like entwined snakes. The endemic Arenga palm grows up to 10m.

This unique ecosystem is a haven for crabs; 120 million of them swarm the island, hiding in the jungle or in their moist burrows, dipping in the cool creeks and freshwater springs, even lurking in limestone caves. Red crabs, freshwater blue, and robber (coconut) crabs are the more obvious, but 14 species of crabs have been identified on the island, resulting in Christmas Island being labeled 'Kingdom of the crabs'. These are not

ordinary crabs. Consider the endemic red crab *Gecarcoidea natalis*, crimson red with a black skull. The carapace measures 12cm across; two prominent claws of equal size help the crab feed on fallen vegetation, dead leaves or fruits on the forest floor. True gardeners of the jungle, they clear everything and their droppings act as a fertilizer. The red crabs remove seeds and seedlings by selective browsing and have a great impact on the growth of the rainforest ecosystem.

Every year at the start of the rainy season, the crabs leave their burrows with the first rains and start a long march towards the ocean. From the central plateau, they descend the limestone cliffs of the shore terraces in an amazing migration that can last up to 18 days. Streams of red crabs flow towards the Indian Ocean in the early hours of the morning and late afternoon when the sun is not too hot. The crabs' migration is timed with the lunar cycle, because this has to do with breeding and release of the eggs during the last quarter of the moon at the turn of the high tide.

The shore terraces, 50-200m wide, circle the island like concentric rings. Their outer margins consist of jagged coral limestone pinnacles carved by erosion channels, where caverns are also present due to swell waves. Once the fringing reef of the island, these terraces are now a nesting ground for brown boobies and silver bosun birds.

The fringing reef is a coral platform extending 20-100m from the shore, rich in an amazing variety of hard corals. It drops



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by terraces to 10-20m, then plunges to 5000m only a few kilometres off the coast. Gerry Allen, once curator at the Western Australian Museum, has identified 575 species of fish. These belong to the Indo Pacific Province (85-90%), Sumatran subzone, which comprises 251 genera and 78 families. Only one species is truly endemic to Christmas, the devillfish *Steenichthys nativitis*. The angelfish, *Centropyge jocularis*, is endemic to Christmas and Cocos, and the damsel, *Stegastes insularis*, is endemic to Christmas and Marcus Island in the north Pacific. Sharks, snappers and large groupers are very scarce, the occasional whitetip or grey reef shark is seen around

points exposed to the current.

The real underwater attraction here is the yearly arrival of manta rays and whale sharks for the red crabs spawning season – they come to feed on the crabs' larvae. Following the ocean currents at the beginning of the wet season, they show up in October and remain until April. Word has it they originate from Ningaloo Reef in WA – that was what stimulated my curiosity and lured me to Christmas Island.

The weekly Merpati flight from Jakarta landed on the island in the heat of the day; the place was a furnace under a killer sun. We transferred to Settlement in a flashy Mercedes Benz. All shops were closed for the weekend, the streets deserted. But the dive centre was open late afternoon so we booked dives for the next day. The Austrian born resident and owner recommended the outdoor cinema that night. "It is a unique event on Christmas, you'll meet everybody, do not miss out." At Poon Saan on the top of the hill we ate Chinese before the show. *Hot Chicks* was playing. The 40 minute walk down hill under the magnificent starry southern hemisphere sky was soothing.

Any time after 8am the Toyota Landcruiser can be seen towing the 21 foot aluminum boat *Phoenix* on a trailer, laden with tanks and dive gear, along the main road through town. We pass by the Chinese temple, the noodle place of the Chinese Literary Association, the CI supermarket and the only roundabout under the imposing structure of the CI Phosphate

company. Downhill, past the Malay kampong is the port jetty, then we reach the boat ramp in Flying Fish Cove.

The dive day started with Million \$ Bommie. Calm clear waters, 40m visibility minimum. I glided down under an overhang at 25m to check a gorgonian coral. Suddenly I had a hallucination: a whale shark was slowly swimming away. Too late, but 'woah'!

At Rhoda Wall on the north coast the coral flat is an enchanting garden of coral mushrooms and bommies of all sizes and shapes. Huge *Acropora* table corals lead to a slope and a wall. I zoomed in on an attractive bubble coral for a shot but was distracted by a great sight: another whale shark cruising just above the reef in 20m. Everyone else was looking out into the blue... Lucky me!

Perpendicular Wall at the northwest tip of the island has undersea cliff overhangs and scenic landscapes. The dive leads to a rocky outcrop with a jutting coral platform. Covered with golden yellow gorgonians and lilac seafans, the dropoff plummets into the deep. The dive ends in the shallows over white sand with scattered bommies, a wide-angle delight. I drifted towards the northwest point in a mild current. Looking like radiators, patches of fire coral were brown with white edges. The fish life got more active too, with schools of bigeye jacks and black snappers.

The boat cruised at low speed along the

walls of Thundercliff Cave when the skipper spotted a big grey shadow with conspicuous white spots on the surface. Everyone became frenzied with masks, fins and snorkels, and jumped overboard. It took serious finning to catch up with the giant, in crystal clear cobalt waters. The sunbeams bounced off its back from all sides; for a juvenile, its leisurely tail kick was powerful. I came alongside three metres away, it turned slowly. I persisted, positioning myself at different angles. The whale shark didn't mind as long as I made no physical contact. His small eyes stared at me, intrigued. Giving up the chase after 10 minutes, I watched it fade into the blue like a silent space ship.

A Japanese submarine was reportedly sunk by the 6-inch British gun of the Fort, near Buck's House, but vanished into very deep waters off Flying Fish Cove. In January 1942 that submarine torpedoed the Norwegian freighter *Eidsvold*, now an accessible wreck close to shore. It lies on the reef flat at 20m, very broken up and coral encrusted. Two long funnels and parts of the ship, including the anchor chain, were clearly visible. Fish frequent holes and swimthroughs. Some 30m away, a vertical wall plunges to 50m and beyond. Remains of the wreck can be seen below. Midnight snappers and bluefin jacks cruised the dropoff, Arabian triggerfish and Koran angelfish preferred the cracks and caves.

Coconut Point is worth special mention. Besides possible encounters with the white mouth moray *Gymnothorax meleagris*,



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1 Endemic red crab  
2 Robber crab  
3 Blue crab  
4 Underground passage for the red crabs

5 Canyon with pyramid butterflyfish, Ryan's Ravine  
6 Diver on the Eidsvold wreck  
7 Gorgonians  
8 Diver on the Eidsvold wreck



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- 1 Colonial house, Rocky Point
- 2 Chinese grave
- 3 Hugh's Dale waterfall, west coast

there's a limestone outcrop seen from the surface. Underwater, a sandy channel leads into a cave, actually a tunnel with two entrances. The passage is big enough for a subway train and there's a side cave at the tunnel bend. The sunlight refracts through the water column, creating a magic atmosphere.

A stone's throw away from Settlement, the old mooring of Flying Fish Cove had some surprises. A few patches of knob coral at 25m have two rather unusual moray species which feed on small damselfish hiding in the coral. The

black cheek moray *Gymnothorax breedeni* is greenish brown with a black marking at the corner of the mouth. With blurry blue eyes, it showed aggressive behaviour, mocking only! The other was the slender, exquisite dragon moray *Muraena pardalis*, white with red, black and yellow blotches around the head. The elongated mouth displayed needle-like fangs and tube nostrils.

A visit to Christmas Island wouldn't be complete without a land exploration, easily done by hiring a car. Made of coral limestone, the dirt roads are very good. Should you need to rough it on the winding tracks, climbing downhill to the seashore, make sure you rent a 4x4, otherwise you may be in trouble. Heading east past the golf course is Lily Beach, where brown boobies are nesting on the cliffs. You may

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