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AQUINAS COLLEGE

EXPEDITION TO WALLABI ISLANDS OF HOUTMAN'S ABROLHOS

August 24th – August 31st, 1964

Sponsored by Mr T Wardle
(‘Tom the Cheap Grocer’)

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MEMBERS OF THE EXPEDITION



Left to Right: P Watson, Br McAppion, B Lloyd, T O'Sullivan, Br Morphett, J McMullen, T Palmer, V Perrott, Br Egan, M Quinn, T Lamond, J Wýche, P O'Neill, N Woods, Br Cleaver, R Nulsen, A De Rossi, D Kabay, C Williamson, Br Wilson, M Gallagher, T Mahony, P Norrish, R Hussey, Br O'Loughlin, P Jones, G McDonnell, D Franklin

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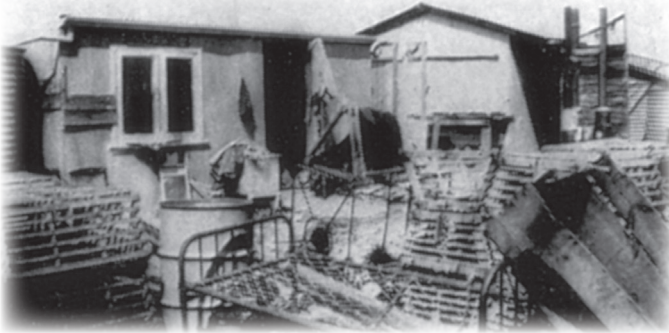
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- D Franklin and M Gallagher
— Physiography
- T Lamond
— Reptiles and Photography
- C Williamson and R Hussey
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— Fish
- P Norrish and G McDonnell
— Molluscs
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— Crustaceans
- T O'Sullivan
— Echinoderms
- D Kabay
— Algae and Photography
- T Mahony
— Algae
- A De Rossi, P O'Neill, N Woods, and P Watson
— History



Left: Aboard the carrier boat, 'Emmalou' Right: Owner-skipper, Frank Bombara



Above: Huts of Ron Burnett and Pat Purchase on Pigeon Island



Above: Offloading the 'Emmalou' at the anchorage
Below: Pigeon Island and craymen's jetties



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OUTWARD BOUND

It must always be a challenge to the educator to offer to the ready and gifted student something in excess of the necessary narrowness of a school curriculum. Where possible a spirit of research and co-operative endeavour should be fostered amongst young men about to enter University. The scattered islands and reefs of Houtman's Abrolhos rightly conjure in the mind a challenge to adventure and the thrill of discovery. Here, we felt, was an ideal setting where contact with the sea in the adventure training spirit of Kurt Hahn's 'Outward Bound' movement could be combined with a worthwhile research study project.

These island groups off Geraldton run almost parallel to the WA coast from North Island, south through the Wallabi and Easter Groups, to Pelsart Island. Once a source of guano, they are now for many months of each year the home of some hundreds of men engaged in our major crayfish export industry. However, in addition to this geographical interest, they must rank for both their historical and scientific interest and the beauty of their coral reefs as the most enticing islands off our long Australian coastline.

After the initial proposal in March of this year of an Aquinas College expedition to the Abrolhos it quickly became apparent that both scientific and historical interest are centered in the Wallabi Group. As it fortunately happened our contact with Frank Bombara, of Geraldton, made this group also the most practicable to visit. Owner-skipper of the seventy foot carrier boat 'Emmalou' which operates between Geraldton and the Wallabi Islands, Frank Bombara made Brs Morphett, O'Loughlin and Wilson very much at home during an overnight stay in the group in May. Our proposed venture was heard with enthusiasm and Frank immediately placed himself and his boat at our disposal for the suggested five days at sea and on the islands. He was later instrumental in organising the loan of several dinghies for use on the shallow reefs around the islands, and in arranging for the use of fishermen's huts on Pigeon Island.

The crayfishing season for the Abrolhos was to finish in early August. The weather in late August is normally good and since school vacation occurs at this time the date for the expedition selected itself. Our quarters on Pigeon Island were to be the then vacated huts of Ron Burnett, John Gliddon, Pat Purchase, and Frank himself.

Now with the approval and encouragement of the Headmaster, Br J C Woodruff, the project had become a reality. Students were to spend the three months prior to departure specializing in pairs in their selected fields of study. Appropriate literature was sought out and necessary techniques acquired. Indeed most who hoped to accompany the expedition were not conversant with either physiography or biology and it was the experience of preparing themselves in virtually unknown fields that was to be one of the benefits of the undertaking.

Brs O'Loughlin and Wilson accompanied the marine biology group on winter excursions to Point Peron and Triggs Island. Here Leaving students David Kabay, Terry Mahony, Terry O'Sullivan, Peter Norrish, Geoff McDonnell, Paul Jones and Terry Palmer gained experience in reef exploration. In addition D Kabay and T Mahony received much help in their algae studies from Mr G G Smith, of the Botany Department of the University, and P Jones and T Palmer discussed their crustacean studies with Dr R W George, of the Museum. Cedric Williamson and Roger Hussey acquired the patience and skills of bird watching, studied the records of Abrolhos bird life, and received much help from Dr D L Serventy, of the CSIRO. He obtained for them the necessary permission and materials for banding selected birds.

Dr G M Storr, of the Museum, was very generous in his suggestions and encouragement to Brian Lloyd and Bob Nulsen whose tasks were to observe the tammars and collect and press specimens of the natural vegetation. Br Cleaver, Michael Quinn and Joe Wyche sought any available copies of maps of the islands and prepared to make a complete survey of the Wallabi Group. Junior students Dave Franklin and Mick Gallagher put their minds and energies to the problems of tide and temperature transect recording, and to seeking out in the literature any relevant information on the geology and physiography of the islands.

The story of the 'Batavia' is told in a scholarly account by Henrietta Drake-Brockman in her 'Voyage to Disaster.' Mrs Drake-Brockman provided an exciting backdrop to the whole project by visiting us at Aquinas College and addressing the whole group. With this stimulating preparation Br McAppion, Tony De Rossi, Pat O'Neill, Nick Woods, and Peter Watson delved into text and document to acquire the necessary historical background.

Although early specialization was a feature of preparation it was hoped that co-operation and exchange of information and ideas when on the islands would occur. That this was the case eventually, was continually in evidence. In fact the historians recorded the rarest reptile find and John McMullen and Vin Perrott, the 'fish experts', spent much of their time observing and collecting reptiles.

All photography was to be in the hands of Trevor Lamond and Dave Kabay. Through the generosity of Dave's father who provided us with all the necessary photographic equipment, and Kodak who gave us the film we planned to use, our photographic records in the form of black and white photos and a library of coloured slides were most pleasing.

Meanwhile the organising of transport, stores, and accommodation were being planned by Brs Morphett and Egan. They were also to be the cooks for the whole group. Through Br Egan and the College Cadet Corps the Army provided life belts, blankets, ponchos, ground sheets, clothing, some provisions, and medical kits. D Kabay, B Lloyd, and R Hussey contacted 'Tom the Cheap Grocer' who very generously sponsored the expedition and this booklet. What

might have been a heavy financial burden through fuel costs was thus removed from the College and students.

At 8.00am on August 24th the College bus left Aquinas and began the three hundred mile journey to Geraldton. The Brothers of St Patrick's College, in Geraldton, generously made the facilities of the College available to us. Unfavourable weather on the 25th delayed us in Geraldton for the day and we used the opportunity to preview the Trades and Industries Fair for the Sunshine Festival and see the city itself.

At 6.30am on August 26th the 'Emmalou' cast off from the fishermen's wharf, her holds filled with an assortment of provisions and gear for collecting, digging, measuring, and living on the islands. The course was west-north-west and our destination just over sixty miles away. Some three hours later the coastline disappeared and at 11.30am the first of the islands suddenly appeared. The low islands and long lines of foam marking the reefs made it only too clear why Houtman's Abrolhos is the graveyard of so many ships. We finally entered the Pigeon Island anchorage from Goss Passage a little after noon. The task of ferrying personnel and equipment ashore was soon under way and by mid afternoon Pigeon Island was our temporary home.

Much colour was added to the expedition by the presence of Max and Graham Cramer, Mery Brown, Hugh Edwards, and Maurie Glazier of the 'Batavia Expedition.' Their services were often much appreciated in facilitating ferrying to and from the islands visited.

The late afternoon of the Wednesday on which we arrived was spent on the nearby Seagull Island. The following day, the 27th, saw most on West Wallabi and the good weather of the following Friday and Saturday enabled us to spend these days on Long and then Beacon Islands. Each evening was spent under improvised lighting preserving and where possible identifying material collected during the day.

The work was physically and mentally tiring and after so much in a too short three days it was an exhausted group which prepared for the return journey on the morning of Sunday, the 30th August. With outboard motors and assorted gear again in the hold and the dinghies lashed down on her deck, the 'Emmolou' set out for Geraldton. An unpleasant easterly died early and a slight swell and gentle breeze brought smiles to those few who had found on the outward journey that they were not immune to the long swell of the ocean.

After assisting at Mass that evening in Geraldton's unique cathedral of St Francis Xavier, we were again accommodated for the night at St Patrick's College. The return journey to Perth on the Monday had a pleasant interlude with a barbecue lunch provided by the Bothe family on their property at Coorow.



Left:
Negotiating shallow coral
reefs in the small boats



Middle:
Return to Pigeon Island
after a day's work



Bottom:
Lunching on a loose coral
ridge on Long Island



Top:
Shoreline typical of the
western islands of the
Wallabies with deeply
undercut consolidated coral

Right:
Tamar Wallaby
in its natural habitat
on West Wallabi



Bottom:
Typical vegetation and
recent fossil undercut just
north of Slaughter Point on
West Wallabi



The expedition yielded much more than was ever anticipated. The quality of the historical and scientific records and speculations can be read from the pages that follow and to a degree assessed. However what cannot be measured and what made the venture above all else worthwhile was the value of the preparation and the experience itself to all involved. Close contact with the sea and its hazards has an educative value all its own, as does living and working as a close group under difficult and at times hazardous conditions. In addition many had the valuable experience of contact with the experts of their various fields and never failed to receive a very friendly and encouraging reception.

Much can still be done on the Wallabi Group and it is hoped that future years will see a repetition of the undertaking there or perhaps elsewhere for the incalculable benefit it can have for those involved.

CARTOGRAPHY

Records of field work in history, biology, or physiography are often best accompanied by appropriate maps. For this purpose detailed maps of the Wallabi Group of Houtman's Abrolhos were sought months before our expedition. The best available was an Admiralty Chart (1723) of 'Houtman Rocks and Adjacent Coast.' The extensive additional area and necessary omission of smaller islands and reefs made it practically useless for our work. Some aerial photographs of the group were also obtained but the perspective of these photos made them useless for actually plotting island positions on a map.

It was becoming apparent that the mapping of islands and reefs would be a very useful part of work undertaken. Simple sketch maps of the major individual islands were prepared before departure and distributed to those working in the field. The final composite map was completed after the expedition using data and outlines obtained while on the islands and with the aid of the aerial photos. Once island positions were plotted these photos were invaluable for completing detail of coast and reef. The 'shallow reef' referred to on the map ranges from reef flat emergent at low tide to deep holes and reef submerged up to two fathoms.

In addition to mapping paper the instruments prepared for the mapping were compasses and binoculars, surveyor's chain, tripod and clinometer (measures simple horizontal and vertical angles by sighting). The Wallabi Group consists of two large islands and thirty smaller islets. The main task was thus to place all islands on a basic grid which was taken from the Admiralty Chart. As many horizontal bearings as possible were to be taken from accessible points on all features visible.

Work began on the day of arrival on Pigeon Island. From the roof of a derelict hut bearings were taken on a distinguishable feature of all islands visible. The most serious difficulty became immediately apparent. The uniform height

and lack of relief rendered individual islands indistinguishable from a distance. Good reference points for bearings were also very difficult to find. A related problem arose later. The low flat islands were difficult to even recognise from different directions. As a result repetitions were necessary and even then some readings had to be disregarded.

Subsequent cross-bearings were taken from West Wallabi, Long and Beacon Islands. The coastal outline and distances were recorded for West Wallabi, and plane table surveys used for complete maps of Long and Beacon Islands. The size of these islands made them ideally suited to a compass traverse and use of surveyor's chain. Lakes, huts, and vegetation were entered on these maps.

In retrospect it can be seen that a better approach would have been to begin taking bearings from the highest point on East Wallabi where there is an elevation of fifty feet. Some islands were only ever seen from a distance and since outlines tend to merge with reef in aerial photographs some corrections may be necessary to the actual shapes of the far eastern and southern islands.

PHYSIOGRAPHY

The islands of the Abrolhos present a picture of confusingly similar low flat islands separated by deep passages and surrounded by many square miles of shallow coral reef, much of it emergent at low tide. They are on the western fringe of the continental shelf and most have appeared since the coastline was drowned. The reefs make the islands very difficult of access and a hazard to light wooden dinghies. The islands fall into four natural groups stretching north from the Pelsart Group for about sixty miles through the Easter Group and Wallabies to North Island.

All of the islands and reefs are composed of coral and shell fragments, some consolidated into a hard rock and the remaining unconsolidated material ranging in structure from a white mud, through grit and shingle, to large coral pieces weighing up to fifty pounds. Even in the consolidated limestone shell and coral fossils are often easily distinguished.

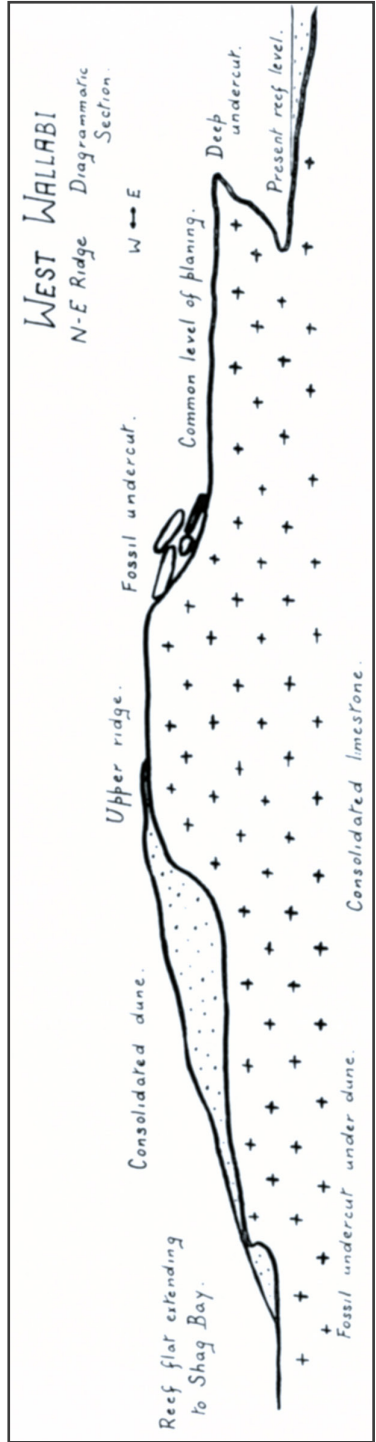
The sequence of marine erosion which has planed the young consolidated limestone of the islands is puzzling. In addition to the present level of marine planing with its shore platforms and deep undercuts there appear to be three other levels.

The most obvious of these is apparent in the flat, undercut, off-shore islands associated with East and West Wallabi. Pigeon and Seagull Islands are typical. These islands are about eight feet above the surrounding shore platforms and were probably planed during the period of a ten feet higher sea-level about five thousand years ago. Marine erosion is the only force in evidence here,

Right: Broken undercut on the north-east coast of West Wallabi

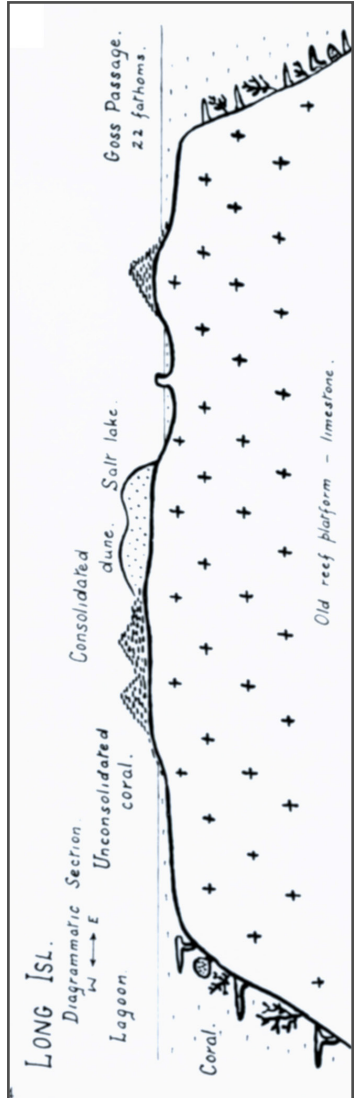
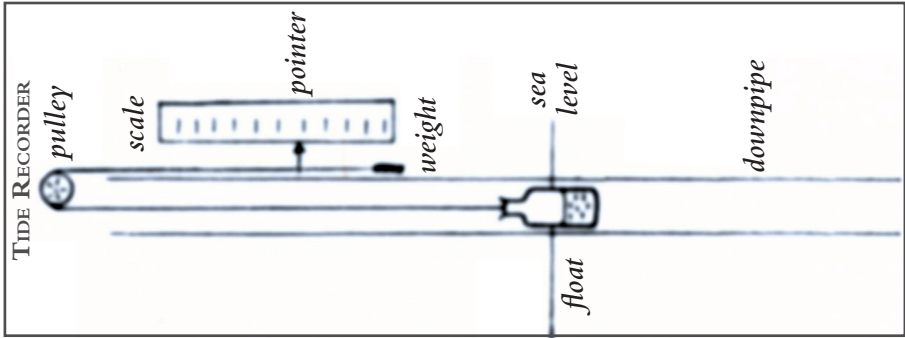


Left: Fossil undercut of the upper north-east ridge of West Wallabi





Western shoreline of Long Island with coral fragments and the first of the unconsolidated ridges



undercutting to a depth of thirty feet occurring at one place on the eastern side of West Wallabi.

Rising above this level is the upper limestone ridge of north east West Wallabi. Evidence of a broken undercut and sharp rise in level of about six feet exists on the eastern margin of this ridge. This undercut would be younger than the most recent period of association of this region with the mainland and is a result of the ten feet higher sea-level period referred to above. The ridge could thus have been emergent since detachment from the mainland proposed at ten thousand years ago.

The rich fauna and flora of the two main islands, East and West Wallabi, would thus represent a survival of mainland forms, and the nearby islands might have been colonized since emergence, from these sources.

The third fossil undercut is in evidence on the central east coast of West Wallabi and in the centre of the island. The associated areas of marine planing are no more than two feet above sea level and before the very recent two feet fall in sea-level were a part of Shag Bay in the north and its counter-part shallow submerged platform in the east.

In contrast with these western islands, Beacon and Long Islands and the others of the eastern group of the Wallabies appear to be of a different and more recent origin. They consist mainly of long, parallel heaps of heavy, unconsolidated coral fragments overlying old reef which is only up to a few feet higher than the uniform submerged reefs of the area. The loose ridges rise to about eight feet above sea-level and at one place there were eight in number across the width of Long Island. The coral on the western side of this island shows some evidence of compaction and undercutting which suggests that accumulation may occur mainly from Goss Passage and that erosion is occurring on the western side. In the centres of these islands some sand has been stabilized by a vegetation cover but from other studies it was clear that fauna and flora were very poor by comparison with the western group.

Most of the western islands are of cracked 'pavement limestone,' with the addition of consolidated and unconsolidated dunes and reef flat on East and West Wallabi, and long sandy beaches across their northern shorelines. The only fresh water on the islands lies in sink-holes in the limestone. Some of these are sufficiently large to act as permanent wells.

The eastern islands in contrast are of unconsolidated coral and grit with some sand accumulation in the centres of the islands between the loose ridges. No fresh water occurs on this type of island but a number of salt lakes lie between the ridges of Long Island. They are slightly below present sea-level and the underlying coral reef can be seen in some places.

Tidal records over the period of three days were unsatisfactory for interpreting any regular pattern. The range at Pigeon Island was less than twelve inches and was very erratic. Extensive areas of surrounding reef and prevailing winds undoubtedly influence the pattern.

It is of interest to note that, as Professor W J Dakin in his book on the 'Great Barrier Reef' points out, the coral reefs of the Abrolhos are the only extensive coral growths on the western margin of any continent. These areas are usually subjected to cold currents. As coral islands they also occur at the highest latitude, and finally the beauty of their coral growths is acclaimed by Dakin even in comparison with the coral of the famed Great Barrier Reef.

BIRDS

Before visiting the islands we ascertained, with the personal help of Dr D L Serventy, of the CSIRO, and Mr V Serventy, of the Nature Advisory Service, what species might be encountered on the Abrolhos in August. Their identification was then studied from texts and in the WA Museum. In addition to observations of birds and their habits in the Wallabi Group, the aim was to band any nesting birds for the CSIRO.

'Banding' consists of closing a metal ring around the right leg of the bird. The ring bears band size and serial numbers which are recorded together with details of time and place. Recapture of banded birds and further release is largely a chance phenomenon but again if serial number, time and place are recorded and sent to the CSIRO then valuable information on migration, longevity and habit, such as when nesting, is continually accumulated. Some seabirds had been previously banded in the Wallabi Group so that an additional aim was to look for banded birds. Dr D L Serventy obtained the necessary bands and permission for our work.

Unfortunately, August is a little early for the main groups of sea birds which visit these islands for nesting. The only bird beginning to nest was the Wedge-tailed Shearwater (*Puffinus pacificus*). This dark petrel is commonly known as the mutton bird. The nests were mainly excavations in the soft dune under bushes, the dark colour of the birds making them very difficult to observe in the shadows. An extensive rookery was found in the soft stabilized dune west of the north-eastern ridge of West Wallabi. Strong leather gloves proved very useful against the claws and strong beaks of the birds when taken from the burrows to be banded. When released they simply crawled back into the nest or hopped about with wings outstretched waiting for their mate to be banded. Twenty Wedge-tailed Shearwater were banded.

Size: 070.

Numbers: 42001 to 42017, 42097, 42099, 42100.

These Shearwater were not found on Long or Beacon Islands, or the other smaller ones visited in the eastern group.

Little Shearwater (*Puffinus assimilis*) were expected in abundance but only two were found. The first was caught in the bush on West Wallabi and the second was grounded on Pigeon Island during a strong blow. After banding they were released. The bands used were:

Size: 070.

Numbers: 42018, 42098.

As might be anticipated from the name there was an abundance of Silver Gulls (*Larus novaehollandiae*) on Seagull Island. No nests were found although the behaviour of the birds seemed at times to indicate their presence. Along the shore were Pied Oystercatchers (*Haematopus ostralegus*), small flocks of crested Tern (*Sterna bergii*), and many Sand Dotterel (*Charadrius leschenaultii*) pecking in the sand and mud.

Several Sea Osprey (*Pandion haliaetus*) were seen hovering above Seagull Island, but the first nest was found on the north-west corner of Long Island. The nest was constructed of sticks and brush, was about five feet high, and contained a clutch of three eggs. The eggs were dull white with red markings, and about 61 x 45 mm. in size.

Further south on Long Island three nests of Sea Eagles (*Haliaeetus leucogaster*) were found, one of which was occupied but there were no eggs present. These birds had a wing-span of about eight feet and hovered about twenty feet overhead when the nest was approached. The nests were neither as high nor as neatly constructed as those of the Sea Osprey.

Another nest of brush was found close to the shore on Long Island on top of one of the coral ridges. From the nature of the single egg in the nest (olive brown, blotched with grey and red markings and 75 x 52 mm.) it was presumed to be that of a Pacific Gull (*Larus pacificus*).

The 'consolidated' dune of Long Island was completely undermined with possibly Little Shearwater burrows but apart from some fresh excavating there were no birds. Flying around the island were flocks of Crested Terns (*Sterna bergii*), diving on shoals of pelagic fish to feed. Small flocks of Fairy Terns (*Sterna nereis*) were also seen.

REPTILES

The reptile fauna of the Abrolhos Islands is rich and varied. The types of seven species have come from these islands and in all there have been 18 species recorded and confirmed. Our survey was centered on the north-east of West Wallabi, Seagull Island, and Long Island. Most previous work had been done on East and West Wallabi with no reptile records for Seagull or Long Islands.

West Wallabi yielded a new species for the islands. It was found and captured by the historical group when excavating in the sand within one of the stone-walled structures associated with Wiebbe Hayes from the 'Batavia.' Its burrowing habit would explain its absence from earlier collections. Dr G M Storr, Curator of Reptiles in the WA Museum, identified the skink as *Rhodona nigriceps*. It was originally described only two years ago and our record is the furthest south known and the only one for the Abrolhos. It has been collected in the Shark Bay area and North West Cape.

Other reptiles recorded on West Wallabi were:

Amphibolurus barbatus minor (Sternfeld)

Western Jew Lizard – abundant in all habitats; one specimen a foot in length; most were infested with ticks

Egernia stokesii (Gray)

Large Spiny-tailed Skink – abundant under and amongst limestone slabs

Gymnodactylus millii (Borg)

Barking Lizard – very common gecko under limestone slabs

Lialis burtonii (Gray)

Common Snake Lizard – three specimens of this uncommon snake lizard; one was two feet in length

Morelia variegata (Gray)

Carpet Snake – very abundant; only snake recorded; up to six feet in length; very sluggish

Phyllodactylus ocellatus (Gray)

White-spotted Gecko – three specimens of this uncommon gecko

Lygosoma (Sphenomorphus) lesueurii (Dumeril and Bibron)

Lesueur's Skink — abundant in all habitats

Seagull Island is a typical off-shore undercut island of the western part of the group. Our records are not new for the islands, but are the first specific ones for Seagull Island:

Ablepharus boutonii (Desjardins)

Single specimen of this skink

Egernia kingii (Gray)

King's Skink – three specimens under a piece of old coral; just over a foot in length

Phyllodactylus marmoratus (Gray)

Marbled Gecko – single specimen

Lygosoma (Sphenomorphus) lesueurii

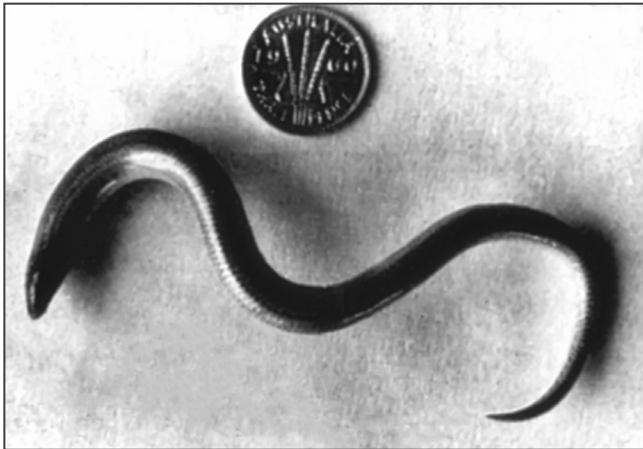
Three specimens



Carpet Snake



Common Snake Lizard from West Wallabi



Rare burrowing skink found in the Slaughter Point Campsite

King's Skink
from Seagull Island



Large Spiny-tailed Skink
abundant on West Wallabi



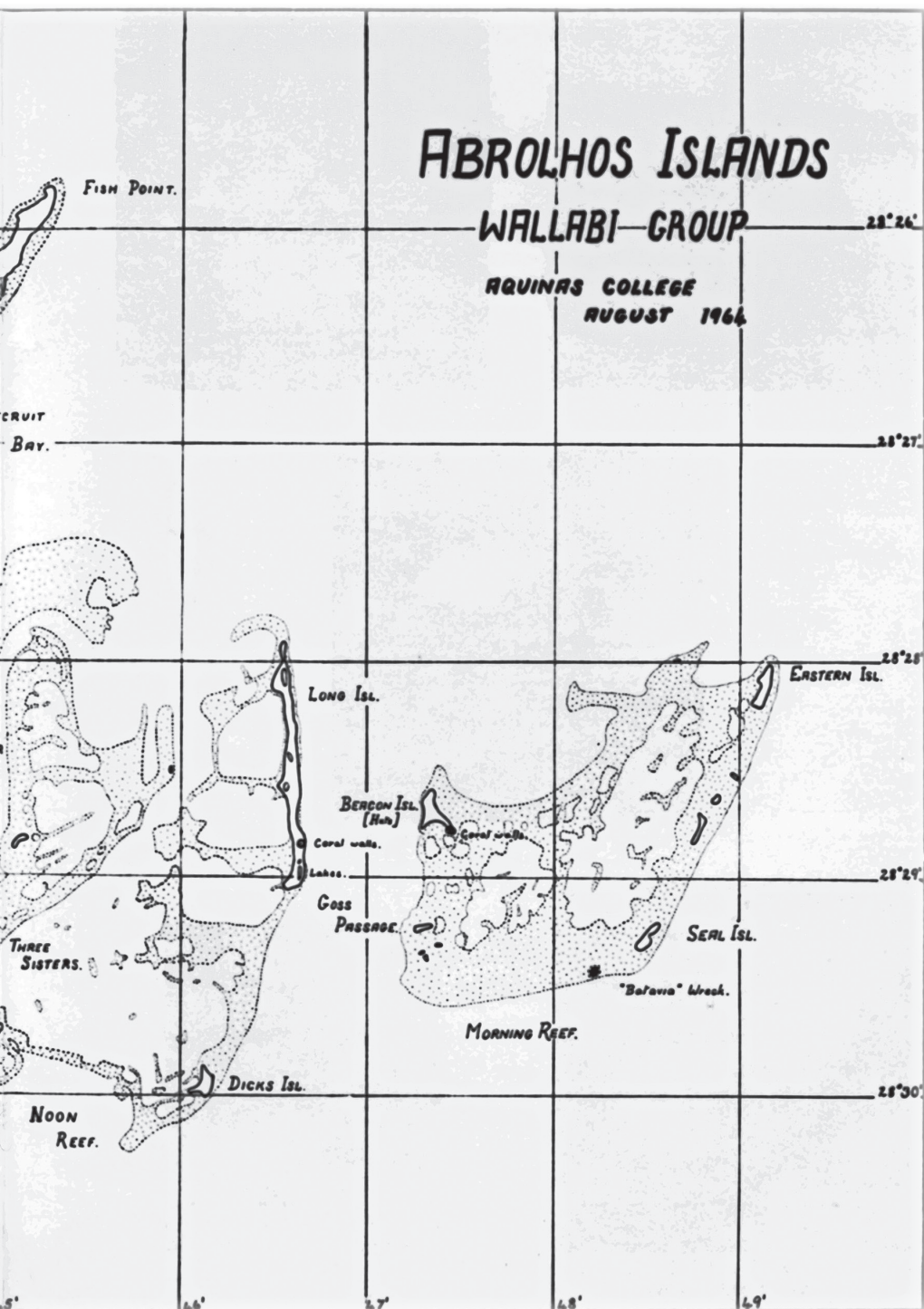


ABROLHOS ISLANDS

WALLABI GROUP

AQUINAS COLLEGE

AUGUST 1966





Top left:
Sea Osprey nest on Long Island

Top right:
Clutch of three eggs of the Sea Osprey

Left:
Little Shearwater banded on Pigeon Island

Bottom left:
Nest of the Wedge-tailed Shearwater
in the soft dune

Bottom right:
Typical attitude of the Wedge-tailed
Shearwater after banding



A close survey of Long Island of the eastern group failed to yield a single reptile. This lent strong support to the observation that both fauna and flora of these eastern islands is of much more restricted variety than in the west. The reptiles of East and West Wallabi and their off-shore islets are a surviving mainland fauna. Any reptiles of the eastern group would be the result of a transmarine colonization.

A single specimen of each species observed was preserved in diluted formalin. All but one were identified before we returned from the islands. This single specimen was the new *Rhodona nigriceps* identified by Dr. Storr and now lodged with the Museum collection.

MAMMALS

Two indigenous mammals are to be found on the Wallabi Group. The more obvious is the Tammar, the wallaby from which the group has received its name. Tammars (*Macropus eugenii*) were observed on the two large islands only and appeared to be more abundant on West than on East Wallabi. They did not take fright readily and were observed browsing on the low shrubs of the islands. The plants on which they were observed to browse were subsequently identified as *Atriplex paludosa* (principal one), *Westringia rigida*, and *Pimelea microcephala*. However observations were limited very much by time.

Less conspicuous is the small reddish rodent (*Rattus glauerti*) peculiar to the Abrolhos. Some were observed during daylight on East Wallabi.

A hair seal appeared on successive days in the anchorage off Pigeon Island. Dolphins were a common sight and a whale appeared south-east of the islands during the return trip to Geraldton.

FISH

One general aim in reef studies was to observe the type and habits of the coral reef fish. Sketching of fish was practised from texts so that what fish were observed could be later identified from sketches without preservation or photography. Choppy waters and the brevity of our stay unfortunately precluded any close studies.

A Southern Fiddler (*Trypanarkina fasciata guanerius*) was found at dusk off Seagull Island. It was well camouflaged on the shallow reef and did not move when approached. It was almost four feet long and weighed about twenty pounds. It belongs to colder waters but from report is plentiful around the Abrolhos.

Moonlighters or Six-banded Coral Fish (*Vinculum sexfasciatum*) was plentiful around Pigeon Island and a Blue Throated Parrot Fish (*Pseudolabrus tetricus*) was taken from deep water.

Albacore (*Thunnus alalunga germo*) and Drummer (*Kyphasus sydneyanus*) were plentiful off Long and Beacon Islands. Jackass Fish (*Nemodactylus macropterus*) were also abundant and retreated quickly into deep water when approached.

Jumping or Flat-tailed Mullet (*Liza argentia*) appeared off the islands at dusk. Flying Fish (*Exocoetus colitans*) lent interest during the return trip from the islands.

VEGETATION

During the day spent on Long Island a complete plant collection was made for the island. Extensive identification in the field is not possible and specimens were pressed dry for later identification which was done by Mr G G Smith, of the Botany Department of the WA University.

Dr G M Storr, of the Museum, has listed about one hundred and thirty plants for the islands of the Wallabi Group. Our list for Long Island proved to be of some interest in comparison. All but three of our nineteen species were recorded for the other islands and as genera of these three species were on record the discrepancy may well lie only in the identification. The chief interest of our list was its verification of a general impression that the vegetation of Long Island was quite simple for its few species and lack of established woody plants. This supports the theory that Long Island is of more recent origin than the western islands of the Wallabi Group with their richer flora.

The following list of plants collected on Long Island is accompanied by a reference to other islands for which they are recorded in Dr Storr's list.

CHENOPODIACEAE

Salicornia australis – Marsh around northern salt lake W Wallabi

Salsola kali – Shallow unprotected coral W Wallabi

Suaeda maritima – Sparse growth in loose coral around the southern lake

Thelkeldia diffusa – Succulent shrub growing in loose coral protected from the wind
W Wallabi, E Wallabi, Pigeon

COMPOSITAE

Olearia axillaris – Low bush on consolidated dunes W Wallabi, E Wallabi Pigeon

Senecio lautus – Low, dense growth in unconsolidated coral W Wallabi, E Wallabi, Pigeon

Sonchus megalocarpus – Coast thistle in unconsolidated coral

GRAMINEAE

Bromus gussonii – Consolidated dune

Polypogon monspeliensis – Sparse growth on unconsolidated coral
in central south part only W Wallabi

Spinifex longifolia – Coastal sand W Wallabi, E Wallabi

MALVACEAE

Lavatera plebeia – Consolidated dune Pelican

AIZOACEAE

Cryptophytum crystallinum – Sparse growth on coral mounds on the west only W Wallabi, Pigeon

Carpobrotus aequilaterus – Common pig-face on flat, unconsolidated coral; pink and white flowers W Wallabi, E Wallabi, Pigeon

ZYGOPHYLLACEAE

Nitraria schoberi – On coral mound at the north end W Wallabi, E Wallabi, Pigeon

SANTALACEAE

Exocarpus aphylla – Sparse bush on consolidated dune W Wallabi, E Wallabi

CRUCIFERAE

Cakile maritima – Sparse on low, central unconsolidated coral E Wallabi

GERANIACEAE

Erodium cicutarium – Unconsolidated coral on the western shore W Wallabi, E Wallabi

MYOPORACEAE

Myoporum insulare – Low bush on consolidated dunes W Wallabi, E Wallabi, Pigeon

URTICACEAE

Parietaria debilis – Undergrowth only on consolidated dune

ALGAE

The reefs from which ‘seaweeds’ (algae) were collected were those fringing West Wallabi, Seagull, Long and Beacon Islands. The plants were preserved temporarily in very dilute formalin solution and then, after rinsing in fresh water, pressed flat and dried between wads of paper. Identification was made by Mr G G Smith, of the University Botany Department.

The brown alga *Sargassum* was very common, other species of the Phaeophyta recorded being *Cystophyllum muricatum*, *Hormophysa triquetra*, *Turbinaria gracilis*, and *Cystophora uvifera*. *Ecklonia*, the common brown kelp of southern waters, was not found.

The common green alga, Sea Lettuce (*Ulva lactuca*) was abundant. A species of *Cladophora* was the other member of the Chlorophyta found.

Species of *Laurencia* and *Hypnea* were the only Rhodophyta observed but both were plentiful. The red algae *Amphiroa* and *Anceps*, which are common at Point Peron, were not found.

The only representative of the Cyanophyta was a species of *Hydrocoleum*.

ECHINODERMS

Sea stars (Asteroids), sea urchins (Echinoids), brittle stars (Ophiuroids), sea cucumbers (Holothuroids), and sea lillies (Crinoids) have common characteristics. All have calcareous plates, or ossicles, in the structure of the walls of their bodies. With the sea cucumber something of an exception, they are radially symmetrical. 'Tube feet' are universally used for locomotion and sometimes capturing food.

Holothuroids

A morning's work on the shallow reef platform of the west coast of West Wallabi resulted in a preponderance of sea-cucumbers being found amongst the sparse algal growth of the part sand part coral bottom.

Three specimens (eleven inches) of a black species of the genus *Holothuria* were handled. On contact they extruded their white thread-like Cuvier's organs. Two specimens (eleven inches long and a half inch in diameter) were taken which showed characteristics of *Leptosynapta*. One was a deep brown with light green markings on the back and no tube feet apparent. This specimen has been forwarded to the U.S National Museum in Washington for further study. The second holothuroid was a deep fawn with white parallel tracery on the back and white specks. The skin tore very readily when handled. The largest example found was a rich tan-coloured specimen measuring ten inches long by four and a half in diameter. Many tube feet on the sole were apparently in three rows and the skin was of a tough, calcareous laced texture. A black specimen of similar length but only two inches in diameter had many tube feet (black and light tan) on the upper surface and specks of small white lime plates over the top and sides.

In a similar habitat on the west side of Long Island two specimens of *Holothuria edulis* were found. Both were pink with black and dark brown markings on the upper surface. They measured nine by one and a half inches with tube feet sparse.

Asteroids

The underside of dead coral pieces almost invariably yielded small specimens of *Asterina burtonii* and *Ophidiaster confertus*, the latter showing many interesting 'comet' forms.

Three purple *Fromia elegans (andamanensis)* were found fully exposed on sandy bottom in three feet of water off Long and Beacon Islands.

Two *Gymnanthenea globigera*, one dark brown, the other bright red, were found under coral fragments on a sandy bottom.

Numerous *Coscinasterias calamaria* were seen moving in the shallows off Pigeon Island.



Top: Brown Alga (*Turbinaria*)



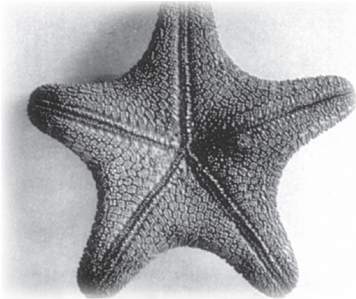
Middle: Common Brown Alga (*Sargassum*)

Bottom: Swift-footed Rock Crab abundant along the undercuts

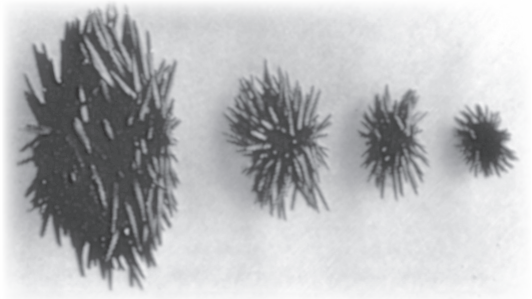




Comet forms of Sea Star (*Ophidiaster*)



Sea Star (*Gymnanthenea*)



Sea urchin (*Echinometra*)

Sea Star (*Fromia*)



Brittle Star (*Ophioneis*)



Echinoids

Colonies of the sea urchin *Echinometra mathaei* were found tightly wedged in pockets of dead coral. The diameters of the tests of specimens collected ranged in size from a quarter to four inches.

Ophiuroids

The shallows to the west of Long Island and of Beacon Island yielded the only brittle stars. Specimens of the large dark *Ophiocoma brevipes* and *Ophionereis schayeri* were under slabs of coral on a coral fragment substratum.

Ophiactis savignyi and *Ophiocoma parva* appeared only in the holdfasts of algae.

Crinoids

The three specimens collected were again adhering to the underside of dead coral fragments in about a foot of water. They were clutching spherical globules within their cirri. One of these sea-lillies has been forwarded to the British Museum, London, for further study.

Identification of most of the specimens named above was made by Dr E P Hodgkin, of the WA University, and Miss E C Pope, of the Australian Museum, Sydney. Temporary preservation in formalin proved a little unsatisfactory due to corrosion of calcareous structures. Slow treatment in sea-water with epsom salts added before the treatment with 70% alcohol for drying, would have been more satisfactory.

CRUSTACEA

Crabs, crayfish, prawns, and barnacles are some of the more common representatives of the Crustacea, a group of predominantly marine animals. Approximately forty different species of crabs alone have been identified from the Abrolhos. We concentrated our observations mainly on the crabs of the littoral and supra-littoral zones of the islands of the Wallabi Group. Identification is possible only by the expert and it was our plan to collect sample specimens, record relevant detail of their habitat, preserve the specimens in diluted formalin, and have them identified in Perth. Dr R W George, of the WA Museum, identified the specimens for us on our return to Perth.

The shorelines of Pigeon Island, West Wallabi, Long and Beacon Islands were studied. The most readily found crab was the Swift-footed Rock Crab (*Leptograpsus variegatus*), mature specimens occurring in cracks in the undercuts along all shores. Representatives of this species found on the islands just off the east coast of West Wallabi were consistently larger than in any other area. There appeared also to be two distinct colour varieties, one black with orange appendages and the other distinctly purple. No young crabs of the less common black colour were found but young of the purple variety were abundant under coral fragments in the inter-tidal zone.

Another common crab was *Ozius truncatus*. It was plentiful under coral fragments on the reef of the inter-tidal zone. Body colour ranged from off-white when young to the rusty brown of the mature crab but claws were always dark brown with white tips.

The small green hermit crab, *Pagurus viridus*, was common, especially in the rock pools at the northern and southern extremities of Long Island. They occupied mollusc shells and tended to occur in 'colonies.' In one pool every shell of about fifty which were examined was occupied by one of these crabs. The pool was about four inches deep at fairly low tide.

Another species found in the shallows around Long Island was *Thalamita danae*. Its carapace is similar in shape to that of the Blue Swimming Crab (*Portunus pelagicus*) of the Swan River, but the colour markings are distinctive. *Thalamita danae* is quite brown as opposed to the blue of the *Portunus pelagicus*.

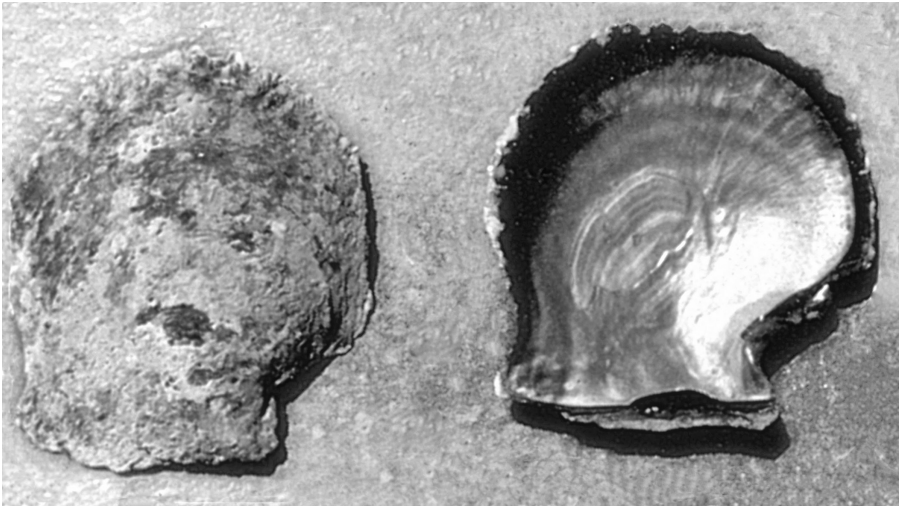
Different species of the genus *Actaea* were found in both rocky and algal habitats. *Actaea calculosa* was found in algal growth on the rock shelf off Beacon Island. *Dardanus megiostos* and *Micippa philyra* were also collected and identified from this habitat. Other *Actaea* species were found under rock in the inter-tidal zone of Long Island together with xanthid species. *Cyclograpsus punctatus* was found under loose coral fragments just about high tide level. Other crabs found under rocks in the intertidal zone of Beacon Island were a *Pilumnus* species and *Trapezia* species. A specimen of *Percon planissimum* was found actually on Long Island near one of the salt lakes.

Four other species of crabs could not be finally identified. An oxryrhynch found in weed in about two feet of water off West Wallabi was tentatively identified as *Huenia proteus* (a 'decorator crab'). Other 'decorator crabs' were found in a similar habitat off Long Island. Quite a large, red, hairy hermit crab was found on the rock platform bordering Pigeon Island. A crab collected off Beacon Island was possibly a *Planes* or *Cyclograpsus* species.

Some other crustaceans were collected incidentally. A prawn killer or mantis shrimp found in algal growth in a rock pool on the south end of Long Island was *Gonodactylus chiragra*. Two prawns in a similar pool were male and female of the species *Alope orientalis (australis)*.

MOLLUSCS

The octopus, oyster, clam, sea slug, coat-of-mail, and shelled organisms are some of the varied members of the Mollusc phylum. Little beyond incidental references could be found for these organisms for the Abrolhos. Our aim was to collect and identify where possible from the texts available, molluscs of the shallow reefs of the Wallabi Group.



Black Lip Pearl Shell



Tonna cerevisina

Dicathais aegrota

Tapes literata



Southern Baler



Tattler Island as seen looking south from the Slaughter Point campsite

Low coral walls of the western half of the Slaughter Point structure



Shelled organisms were preserved by removing the soft body after boiling, and then coating the shell with clear lacquer. Large molluscs such as the sea hare and octopus were photographed.

Pelecypoda

Growing firmly cemented to vertical limestone in the upper inter-tidal zone were a harvest of Coral Rock Oysters (*Saxostrea amasa*). These edible oysters were plentiful around West Wallabi and Long Island and occur on the Great Barrier Reef.

The most attractive of the bivalves found was a specimen of the Black Lip Pearl Shell (*Pinctada margaritifera*). It was on the shore platform in a fathom of water and had the beginnings of pearl formation.

Single specimens of Painted Pearl Shell (*Pinctada fucada*), Lettered Tapes (*Tapes literata*), and Painted Scallop (*Gloripallium pallium*) were collected. The Hairy Mussel (*Trichomya hirsuta*) and Wharf-pile Mussel (*Mytilus planulatus*) were abundant on the shore platform and amongst the algal growth.

Gastropoda

The gastropod molluscs observed ranged in size from the very large Southern Baler (*Melo miltonis*) and Angas's Sea Hare (*Aplysia angasi*), which were both about a foot in length, to the small Tuberculated Periwinkle (*Nodilittorina pyramidalis*).

The most striking colours were seen in the West Australian Sea Slug (*Glossodoris westraliensis*). This nudibranch is a brilliant blue with black, orange, and red markings. Bright colours were also present in the Apricot Side-gilled Slug (*Pleurobranchus punctatus*) and Rose Petal Bubble Shell (*Hydatina physis*).

Two cowries were frequently found. Every reef examined yielded specimens of the Milk-spotted Cowrie (*Cypraea vitellus*). More numerous in parts but not as widely distributed were the Serpent's Head Cowrie (*Cypraea caputserpentis*).

Only a single specimen of the common Purple Periwinkle (*Melaraphe unifasciata*) of the southern coast was found, but the Black Periwinkle (*Melanerita melanotragus*) was abundant along the inter-tidal undercut.

Four other gastropods were frequently encountered on the fringing reefs. *Tectus obeliscus* occurred around Long Island and invariably carried Bonnet Limpets (*Sabia conica*) and a species of *Siphonaria*. The Cartrut Shell (*Dicathais aegrotata*), *Senectus intercostalis*, and *Ninella torquata*, wedged in limestone crevices, were common.

Many bleached shells but only one live specimen of *Tonna cerevisina* were found around West Wallabi. Of the remaining gastropods which were identified only one or a few specimens were found — Chocolate-banded Cone (*Dyraspis*

dorreensis), *Anemone Cone (Floraconus anemone)*, *Strombus floridus*, *Mitra glabra*, *Drupa ricinus*, *Morula uva*, *Vicimitra contermina*, and *Cerithium fasciatum*.

Cephalopoda

Flinder's Octopus (*Octopus flindersi*) appeared to be abundant and the only one observed.

Amphineura

Although a careful search was made no chitons were observed along any of the undercuts.

History

INTRODUCTION

In October of 1628 a fleet of the United East India Company left Amsterdam bound for the company headquarters at Batavia. On board the 'Batavia,' the flagship of the fleet, was a certain Francisco Pelsaert, the senior merchant of the Company, who was burdened with the responsibility of both ships and cargo. Some months later (June 4th 1629) the 'Batavia,' separated from the rest of the Company fleet, was wrecked on a reef in the Wallabi group of the Abrolhos Islands.

In his journals Pelsaert recounts that a small group, including both Pelsaert and the captain of the 'Batavia,' set out in a small boat to find water. Eventually this small boat reached Java and Pelsaert returned in the 'Sardam' to record a sorry tale of murder and treachery.

Some time after Pelsaert's departure, Wiebbe Hayes, a noncommissioned Army Officer from the 'Batavia' was placed in charge of an ill-equipped group and detailed to find fresh water. After several days the party found two wells (sink holes) on 'High Island' (West Wallabi) and Hayes lit fires to signal the success of his mission. But in his absence there had been a general massacre. Soon after the wells were found, some survivors arrived to warn Hayes not to return to 'Batavia's Graveyard' (Beacon Island). For the next three months Hayes and his men occupied West Wallabi and successfully defended it against several attacks by the mutineers.

The story of the 'Batavia' is very well known, for the journals of Pelsaert that contain the grim details have inspired not a few novels and works of scholarship. But it was not until the discovery and subsequent confirmation of the wreck site in June, 1963, that there could be any active investigation of the adjacent islands of the Wallabi Group.

Max Cramer, of Geraldton, and his associates had already investigated certain coral slab structures on Beacon Island and Long Island, and knew of the existence of certain similar structures on West Wallabi Island.

It was West Wallabi and Wiebbe Hayes that commanded the attention of our study group. For with the material evidence on Beacon Island, West Wallabi could be identified as Wiebbe Hayes' Island, called alternatively 'Long Island' or 'High Island' in Pelsaert's Journal.

THE OBJECTIVES OF OUR STUDY GROUP

- 1 To investigate a number of sites on West Wallabi and to verify, if possible, that these sites were related to Wiebbe Hayes' occupation of the Island.
- 2 To establish the subsistence diet of these castaways.

On the Location

Once base was established on Pigeon Island, the history group attempted to find its way to West Wallabi, hoping to spend the remaining hours of the afternoon reconnoitering the section we expected to hold interest. But our only discovery for the day confirmed that West Wallabi, surrounded by reef flats, was not an easy island to approach. On the following day we made a successful landing and divided into small groups to make a preliminary investigation. The remaining days were occupied with a rather more detailed examination of the various sites described below.

Details of Investigation

1 Slaughter Point Campsite: This structure closely resembles, in size, shape and the use of materials, the structures we visited on Beacon and Long Island. Low walls divide this structure into two definite sections, the walls resembling the foundation walls of a small two-roomed hut. The eastern and smaller 'room' is not as well preserved as the other. It seems possible that this section is an afterthought to the original structure. All objects of interest were found outside the western section of the structure. This area yielded the most conclusive evidence of occupation.

a) Pottery fragments were subsequently identified by Chris Halls of the West Australian Museum, as Bellarmine jar fragments and similar to fragments found on both the 'Batavia' wreck and near the Beacon Island structure.

These pottery fragments were found outside the walls and at a depth of 8"-10". All the pottery fragments were recovered from a trench 10" deep and 18" wide that was dug around the walls. The interior perimeter, and diagonals were also trenched to 10", but no pottery was recovered inside the shelter. The area trenched was thoroughly sieved to recover the various objects of interest, but the

excavation depth was too slight (10") for a stratigraphical sketch to be conclusive, but it is significant that the base of the stone structures was some 8"-10" below the present level, i.e., at that level which yielded the pottery fragments, and the two nails.

b) Two ships nails were also recovered from exterior trench. The better preserved nail was recovered from a fireplace at the south west corner.

c) Several stone objects, possibly artifacts, were recovered from within the shelter. Further investigation is necessary on this point, but it seems unlikely that these are chance fragments left when the stone structure was being built.

d) Animal bones, identified as seal, tammar (a small wallaby) and mutton bird bones, as well as oyster shells were recovered in medium quantity both inside and outside the structure. Most of these fire-burnt bones were recovered from the two discovered fire places at the 8"-10" depth, but not in an expected quantity. It can be concluded therefore, that either (1) food scraps were disposed of elsewhere, or (2) the main camp fire, possibly some short distance away, has not been discovered, or (3) this structure is not the main campsite.

2 Inland Campsite: Although a larger structure than the previous campsite, there were close similarities in shape and workmanship. This structure was built on a flat rock base, which was once a reef flat. The well is the main feature at this site, but we did not conduct an investigation of the well. There are also two stone fireplaces outside the structure, but there is no evidence that they relate to the shelter. From one of these fireplaces two small pieces of metal were recovered, but there is no evidence that any significance can be given to these.

3 A well further inland was not examined thoroughly. The only circumstantial evidence at this site is a cairn of stones. A small ridge separates the two camp structures, but both are clearly visible from the cairn at the second well site. More investigation would be necessary before any significance could be attached to this finding, but it is well to bear in mind that Hayes' group were under constant fear of attack and would need some system of communication.

4 The fireplaces were made of limestone slabs wedged together on edge to form a hollow cube. These are sited on the shore quite near the Slaughter Point campsite. Once more there is only circumstantial evidence relating them to Wiebbe Hayes, but none-the-less their position is such that no other practical explanation seems possible.

Conclusions

- 1 The pottery supports the belief that Slaughter Point camp site was used by Wiebbe Hayes or his contemporaries.
- 2 The nature of each structure on West Wallabi associates it with structures on Beacon and Long Islands.



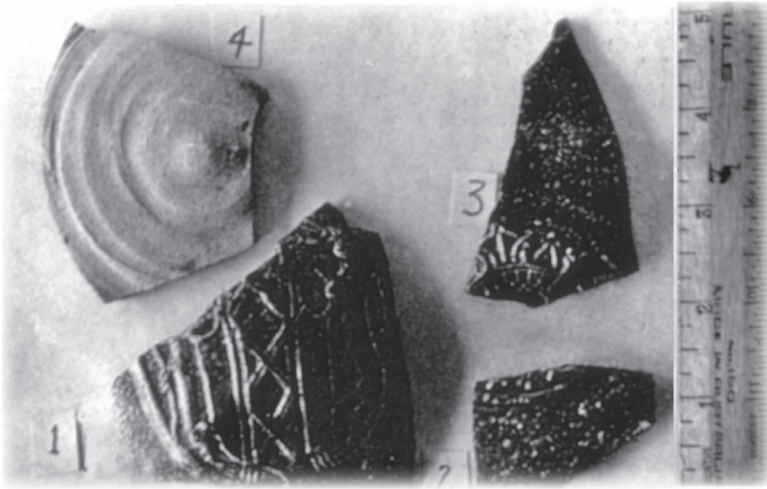
Above:
Inland campsite
on the reef flat of West Wallabi



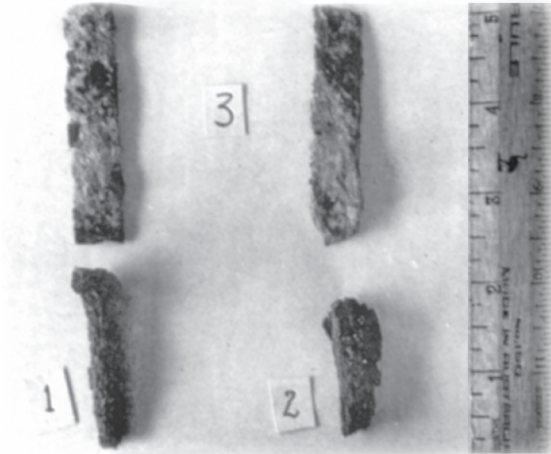
Middle:
Coral walls excavated
on Long Island



Below:
Walls on eastern end
of Beacon Island

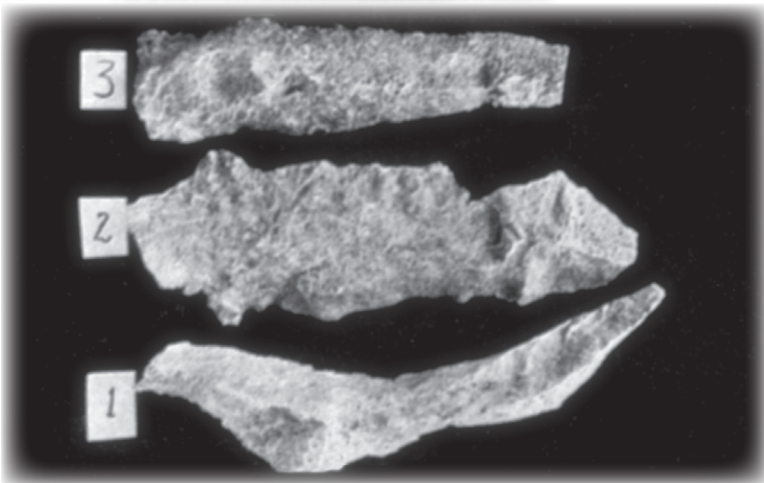


Above:
Dutch pottery recovered from the
Slaughter Point campsite



Middle:
Pieces of metal from a fireplace
of the inland campsite, and
ship's nails from Slaughter Point

Below:
Regular pieces of sharp coral
found within the walls
at Slaughter Point



N.B.: Although it seems conclusive that Hayes or his contemporaries used these campsite structures, there is too little evidence that this was the main campsite for more than forty men during a three month stay on the island. Our study of the area was too limited in time to provide further evidence. A more detailed study of the sites already investigated seems obligatory, not only to verify present findings, but to increase our information on the sites that were visited.

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