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A detailed nautical chart of the Wallabi Islands and Houtman's Abrolhos. The chart shows the outlines of East Wallabi Island, West Wallabi Island, and several smaller islands including Slaughter Pt, Little Pigson Is, and Bitter Island. It includes depth soundings, compass roses, and various navigational markers. The text is overlaid on the chart.

AQUINAS COLLEGE

SECOND EXPEDITION TO WALLABI ISLANDS OF HOUTMAN'S ABROLHOS

August 23rd – August 31st, 1965.

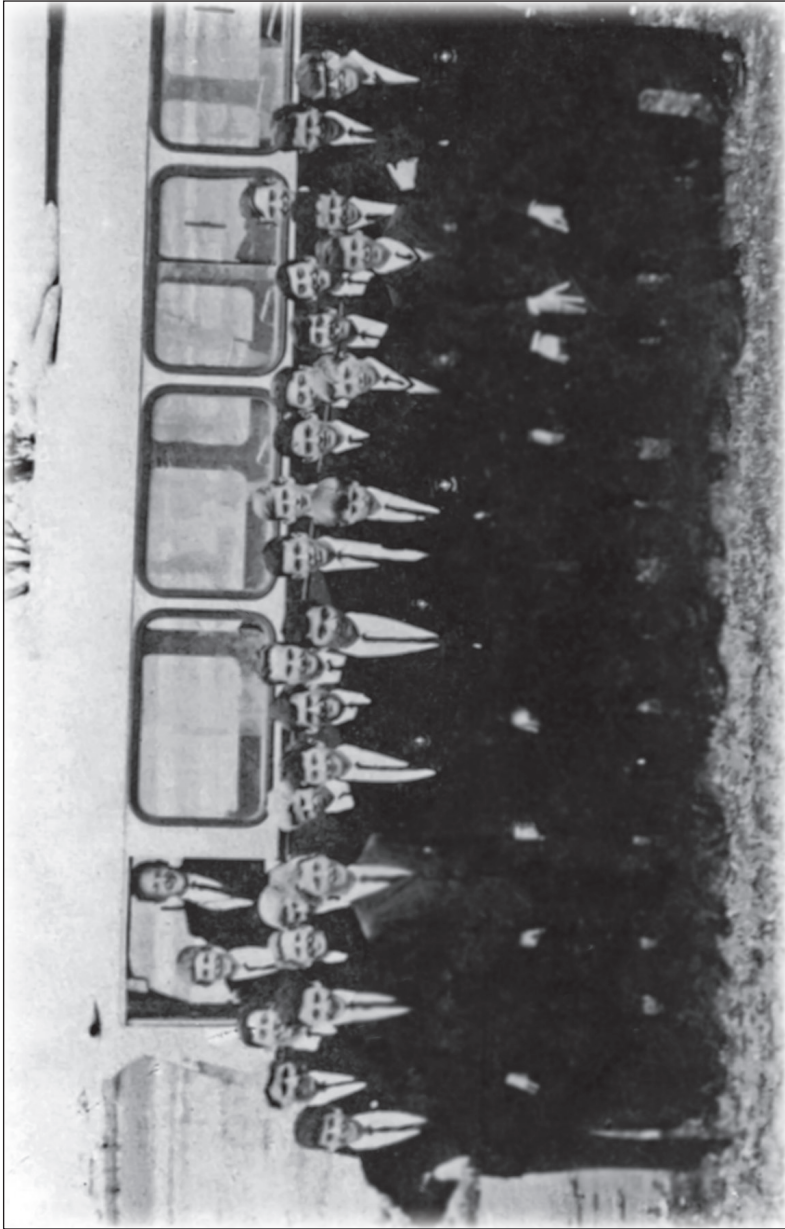
Sponsored by Mr T Wardle
(‘Tom the Cheap Grocer’)

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MEMBERS OF THE EXPEDITION



Left to Right: D Norris, B Read, G Hesford, J Kyle, C Back, J Lucas, P Greenwood, R Bryant, R Quinn, D Franklin, G Warner, P Bucholz, M McCann, D Hermon, P Moir, M Wall, J Waddingham, T Sweeny, P Gardner, W Mathews, J Williamson, S Bradley, F Lister, M Hanrahan, I Thompson, J Wyche, J Kelly

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- Br N N Wilson
— Boating Supervision and Marine Field Work.
- Brs R M Morphett and B E Egan
— Transport and Provisions.
- Br L M McAppion, B.A.
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- Mr K D O'Sullivan
— Mapping.
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- Br J R Murphy, St Patrick's College, Geraldton.
- Mr F Bombara and crew members L Kendrick and P Burnett, Geraldton.
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- C Back, J Kyle, and M Wall
— Birds.
- J Kelly and D Norris
— Mammals.
- D Hermon, W Mathews, and J Williamson
— Reptiles and Vegetation.
- D Franklin, P Gardner, F Lister, R Quinn, and J Wyche
— Mapping and Physiography.
- P Bucholz, P Greenwood, and G Warner
— Echinoderms and Molluscs.
- S Bradley, M Hanrahan, B Read, I Thompson, and J Waddingham
— Echinoderms.
- G Hesford and M McCann
— Photography.

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HOUTMAN'S ABROLHOS REVISITED

Accompanied by Fr Columba Nolan, OSB, and Dr John Saunders, an Aquinas party of twenty-six students and six members of staff visited the Abrolhos Islands for a week in the August vacation. Encouraged by the success of the 1964 Expedition and the enthusiastic reception of the booklet published later, the College again sought the generous services of Mr Frank Bambara, of Geraldton, to take personnel and equipment to the Wallabi Group to continue the scientific and historical investigations begun so fruitfully the previous year. As in 1964 the heavy costs of travel and publication were met by Mr Tom Wardle ('Tom the Cheap Grocer') who very kindly sponsored the Expedition.

All appreciated very much the contribution to our expedition of Fr Columba, of New Norcia, Dr John Saunders, Br Murphy, from St Patrick's, in Geraldton, and John Lucas, of the University Zoology Department. John brought from the University live traps, which were to be a feature of our studies of the native rodent, and his own wealth of knowledge of marine biology to stimulate those who were working on marine life. The presence of Fr Columba and Dr John Saunders was reassuring during a week of exposure to the dangers which must necessarily accompany any such expedition as ours. We will not quickly forget the experience of our Sunday Mass crowded into a small fisherman's hut on desolate and remote Pigeon Island.

Preparatory study in the various fields of science and history began after the May vacation and, while shorter in duration than in 1964, was equally thorough. This was possible largely because of the experience gained and good contacts established by last year's members with the CSIRO, University, and Museum authorities. Planning of the science field work was in the hands of Br O'Loughlin, and it fell once again to the lot of Br Morphett and Br Egan to organize travel, provisions, and equipment. We were fortunate to be made very much at home when in Geraldton by Br Dally and the staff of St Patrick's College. Likewise the Abrolhos fishermen of Pigeon Island were most generous in providing us with huts and facilities in their absence. The Bothe family at Coorow broke our return journey to Perth by entertaining all to a barbecue.

Our outward sixty mile trip to the islands was made rather unpleasant by heavy seas which fortunately abated as the day wore on. The warm sunny days to follow and flat calm within the protecting outer reefs made for very pleasant memories of our week's stay. Conditions were optimal for scientific and historical work. The thrill of discovery, the unruffled beauty of the coral growths in the lagoons, the quaint unfrightened fauna, the constant scream of gulls and terns and thunder of distant surf, the remote aloneness and spirit of camaraderic, combined into a rich experience for all. Strong winds and big seas very nearly prolonged our stay but radio assurance of improving conditions nearer the coast enabled the 'Emmalou' to return to the now

stangeness of solid land and civilization.

Work between and around coral islands and reefs requires skilled ferrying in aluminium dinghies. In addition to leading the marine explorers, Br Wilson catered for transport at the islands. Brian Read, John Kelly, and Dave Norris were most efficient dinghy masters. To supplement the Aquinas 'Speed Topper,' Randell Marine loaned an aluminium 'Tradewind,' and some of the fishermen made their dinghies available. All were taken out to Pigeon Island lashed to the fore-deck of the 'Emmalou', and as such were an added safety precaution to the life jackets provided for us by the Army.

On Mr Sullivan and his hard-working band fell the task of mapping. Detailed contour mapping of East Wallabi was undertaken to assist later physiographical, biological, and historical work. The demanding daily task of sighting, trekking, measuring, and marking was carried out by Joseph Wyche, Peter Gardner, Frank Lister, Redmond Quinn and Dave Franklin who also made seine physiographical studies. Frank Lister did a similar survey of the very much smaller Eastern Island. Through the assistance of the Lands Department a better map of the islands and reefs has been produced.

Observations of nesting birds made in 1964 and added to considerably this year are the first records ever made on these islands during August. Most ornithologists visit the islands later at the height of the nesting season, and our work has helped to fill some gaps in the literature. Chris Back, Mick Wall, and Jim Kyle directed their attention mainly to the bird life and experienced the varied thrills of approaching the occupied nests of the awesome Sea Eagles and Sea Osprey, of being subjected to the screechings of a flock of thousands of Crested Tern hovering above their eggs, of taking the vindictive Little Shearwater from their long burrows for banding, and of finding two fledglings of the Brush Bronzewing in their well-concealed nests.

With the assistance of Ross Bryant, Tom Sweeny and Peter Moir, Br McAppion conducted a very thorough historical investigation of the Slaughter Point campsite of Wiebbe Hayes, wrecked on the 'Batavia' in 1629. Their sifting unearthed further evidence of the occupance of these early Dutch at this site of earliest European association with our Australian continent. Dutch Bellarmine Jar pieces, iron fragments including some apparently bent to act as fish hooks, and burnt animal bones were recovered by painstaking sieving of the sand surrounding the low coral walls. A most interesting find was a leaden ladle, and some sheet lead and lead droppings. As in 1964, the historians came up again with an uncommon reptile find. It was a Bandy Bandy snake, found rarely because of its burrowing habit.

The most significant reptile find was on Eastern Island. This island of coral shingle was found to have a dense population of the very elusive Grey's skink, previously unknown from offshore islands and never before recorded amongst

the abundant reptile fauna known for the Abrolhos. Fraser's Scale-footed lizard was found on East Wallabi Island, the only other record being in 1917. Warwick Mathews, Joseph Williamson and Dennis Hermon recorded these, and the identity, distribution and population density of the more common reptiles found. They also began a study of the feeding habits of three of the larger lizards, based on stomach contents. While on Eastern Island, a complete vegetation survey was made, flowering representatives of all species being brought back to Perth for formal identification.

One aspect of fauna study on the two main islands was to sample ecto-parasites from both the native rodents and reptiles. The ticks and mites collected are now in the WA Museum awaiting future study. Most of this work fell to Dave Norris and John Kelly. Their investigations also proved the presence on Pigeon Island of the ship's rat. This threatens the extermination of the indigenous native rodent. A programme has already been implemented by the Fisheries and Fauna Department for the protection of this rare representative of our native fauna.

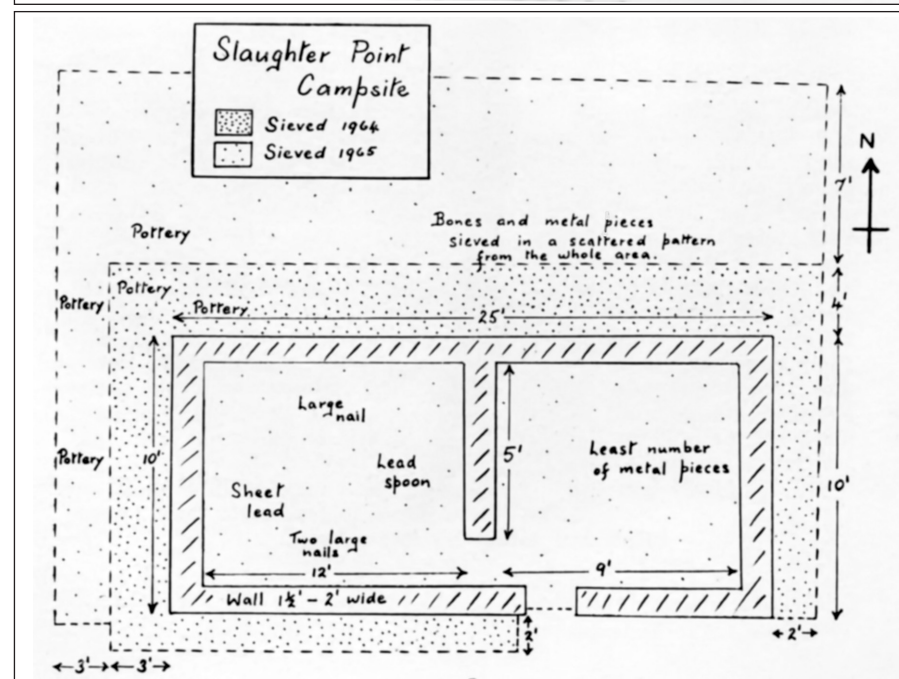
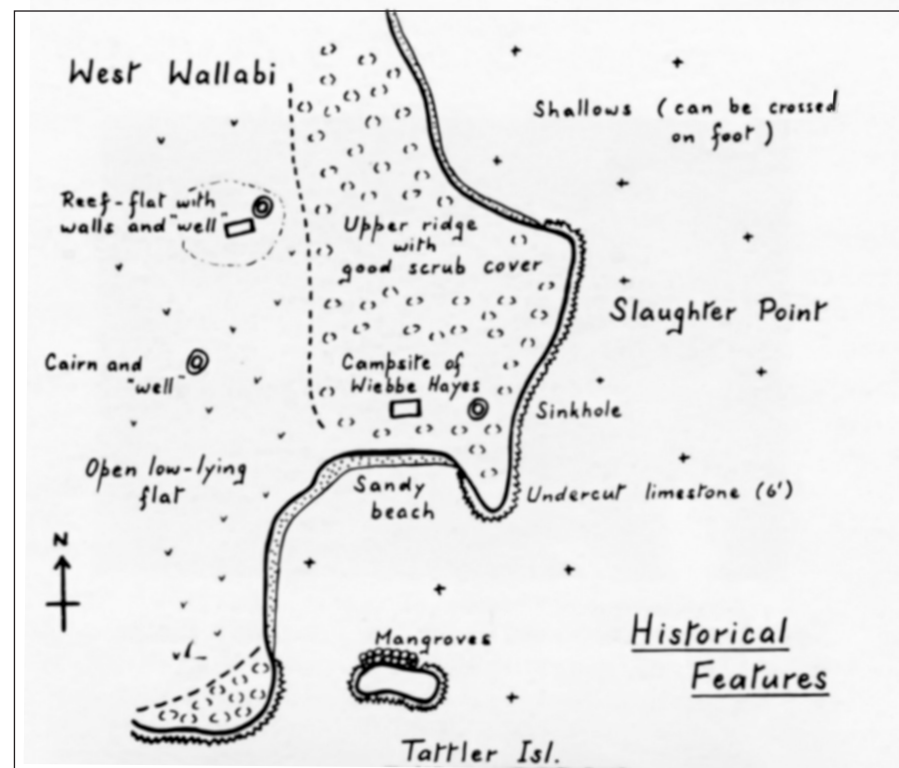
The largest group working together comprised those engaged in making a complete echinoderm collection, primarily for the National Museum. Dredging was not possible but a thorough coverage of shallow reef in varying localities was made. John Waddingham and Brian Read worked solely on echinoderms. In addition Paul Buchholz, Gerard Warner, and Peter Greenwood confirmed the presence of the molluscs recorded last year and collected some new species. Ivan Thompson endeavoured to identify and record what corals were seen. Some carnivorous mollusc traps were set around Pigeon Island in the shallows late at night, and were then visited in early morning by Mick Hanrahan and Steve Bradley.

Most photography was handled by experts Geoff Hesford and Mick McCann. The result of their efforts is a set of very fine general interest and close-up colour slides of marine and terrestrial specimens.

This second very satisfying and rewarding visit to the Wallabi Group prompts yet another similar expedition. Many of the observations made during the two visits so far have raised interesting questions, and some possible fields of investigation have not even been broached. No attempt has been made to collect many of the marine and terrestrial invertebrates, and most of the smaller islands have not been visited. Further interesting questions of comparison are raised by the possibility of a trip to the Pelsaert Group, the southernmost islands of Houtman's Abrolhos.

HISTORY

Two hours before daybreak on June 4th, 1629, the 'Batavia,' flagship of a fleet of the Dutch East India Company, struck the southern part of Morning Reef in the Wallabi Group of Houtman's Abrolhos. The wreck was to remain





Trenching and sieving in the soft coral sand at Slaughter Point

Animal bones,
pieces of metal, and Dutch pottery
recovered from the Slaughter Point Campsite



Left: Lead ladle (about 7.3 inches long)

Right: Ship's nail (about 6 inches long)



unrecognized until June 4th, 1963, three hundred and thirty-four years later. For Henrietta Drake-Brockman, the discovery climaxed a lifelong interest and years of research into the location of the remains of the 'Batavia' and the scene of the grim history enacted after the wreck. Details of the research and the Journals of Pelsaert are included in 'Voyage to Disaster.'

The names 'Wreck Point' and 'Pelsaert Island' were given and have been used for many years in reference to the Southern Group of the Abrolhos in the mistaken belief that it was here that the 'Batavia' struck. In retrospect, it is of interest that Prof. W J Dakin, in a paper on Houtman's Abrolhos read as far back as 1917, includes evidence that should have corrected this mistaken belief. A detailed account of the events following the wreck of the 'Batavia' is included in the paper. These are known from first-hand account recorded by Francisco Pelsaert, senior Company merchant on the 'Batavia.' Dakin actually quotes Pelsaert's Journal for its quaint description of the tammar wallaby. He then further observes that this marsupial occurs only in the Wallabi Group. In the paper the relative 'height' of East and West Wallabi is described, and a map is included which shows 'well' sites on East Wallabi. All three observations by Dakin highlight internal evidence in Pelsaert's Journals as to which of the Groups of the Abrolhos has to be the scene of the wreck, and subsequent murders, fights, and executions. Dakin, however, unquestioningly quotes the 'Pelsaert Atoll,' some thirty miles to the south, as the scene of the events.

During the visit to the Wallabi Group in 1964, an investigation of two low stone-walled structures on West Wallabi was begun. Their origin was found to date to 'Batavia' history since both were identical in detail of construction with similar ones visited on Long Island (Seal's Island in Pelsaert's Journal) and Beacon Island (Batavia's Graveyard in the Journal). The latter were historically related to the events of 1629 when Beacon Island was investigated the previous year, after the discovery of the wreck. In addition to constructional evidence, Dutch Bellarmine jar pieces were found in the sand near the walls on Slaughter Point. Similar pieces were found in 1963 on Beacon Island. Oyster shells, and the burnt bones of tammar, seal, and bird were also found near this Slaughter Point structure. We know from the Pelsaert Journals that loyal survivors of the mutiny occupied West Wallabi for some months under the leadership of Wiebbe Hayes. Thus the structures on West Wallabi were built and used in 1629, and Slaughter Point was at least something of a permanent campsite.

Historical investigation this year was to be centred around the structure on Slaughter Point. No sieving is possible in the immediate vicinity of the other inland walls, since they are built on a limestone reef-flat. At Slaughter Point a more extensive area was pegged for trenching and sieving. As a result of the 1964 investigations, digging was carried out to a depth of about ten inches. Hand trowels were used extensively for preliminary digging so that any evidence of a possible three month stay at this site would not be destroyed.

The most interesting finds were in the western half of the structure. A ladle or spoon, roughly fashioned in lead, was unearthed within the walls. This ladle was fashioned from sheet lead, and it was significant that a small quantity of sheet lead and some lead droppings were also found within the western walls. Evidently some sheet lead was available for the survivors and from it crude utensils were fashioned. Driven through the handle of the ladle was the head of a nail, and the handle was bent at this point. It seems that there was originally some further attachment to the ladle.

A large quantity of iron fragments was sieved from the sand. The total weight was some pounds. These metal pieces were recovered from the whole area sieved, but the three large nails found were all in the western part of the structure. These discoveries support an observation made in 1964 to the effect that the eastern end appeared to be an 'afterthought' and may well have been added to an original structure.

The bent shape of some of the iron fragments suggested the possibility that they may have been fashioned into fish-hooks. Lead was worked and probably nails were bent in this area, and hammering would thus have taken place. This could explain the presence of the stone artifacts found in 1964 and again this year. They could represent chips off pieces of consolidated limestone subjected to hammering.

As in 1964, Dutch Bellarmine jar pieces and burnt bones were again found this year. Two of the pottery fragments completed a coat-of-arms design with two of the fragments found in 1964. The burnt bones were mainly those of the tamarar.

Evidence of a three month stay by forty men was not found in 1964. This year's discoveries are more reassuring. The men on West Wallabi were very poorly equipped on their arrival, and it seems unlikely that evidence more satisfying than that unearthed to date will be found.

The chaplain to the 'Batavia,' Gijsbert Bastiaensz, survived the massacre and eventually joined the group on West Wallabi. In a letter written later about the events, he describes his stay on West Wallabi. The letter is of particular interest in view of the above discoveries:—

Time would fail me to relate everything; how miraculously God has blessed the good ones who were together, with Water, with fowls, with Fish, with other Beasts, with Eggs in basket-full; there were also some Beasts which they call Cats and with as nice a taste as ever I tasted. Of the guns and pikes they made, one is inclined to say how it is possible that Men can invent such things? There was water also, Sweet as milk, in wells.

The description of his arrival at West Wallabi with the mutineers seems significant. If, as is believed, the loyal survivors were established on Slaughter

Point, then the 'Island' referred to would be Tattler Island. From the description alone, the island which would best suit the events would again be Tattler Island.

Coming on an Island opposite those people, they gathered immediately and derided us, saying, has it gone so far that the good Man, the Predikant, has to come along? Then they went over in their little Boats.

[Translation from Appendix IV of H Drake-Brockman's 'Voyage to Disaster.']

On our return to Perth all findings were taken to the West Australian Museum. Mr Chris Halls positively identified the pottery fragments and confirmed that the 'Batavia' carried sheet lead. All material was photographed by the Museum, and authority was given to Aquinas College to retain these 'finds' for display purposes.

BIRDS

Abrolhos fishermen spoke of their winter season before our visit as being a comparatively mild one. Craypots were set on normally inaccessible reefs, and exceptionally good catches were 'pulled.' This mild winter may account for the presence of some of the species of nesting birds which were not observed in an identical period in 1964. Bird life in general in the Wallabi Group seemed to be more abundant.

Most interesting in many ways was the unexpected presence of a large, compact colony of Crested Tern (*Sterna bergii*) nesting on West Wallabi. The nests were on the shore just east of the salt lake and south of Mangrove Island. A similar colony was observed here by G M Storr in early September, 1959. Sonic thousands of single eggs were laid on the coral shingle just above high-water mark. As the colony was approached the screeching terns rose to a height of about twelve feet, their black crown feathers forming shaggy crests. Their nest-scrapes were barely discernible on the coral shingle, and the eggs were white with varied dark brown and red markings. Numbers of Caspian Tern (*Hydroprogne caspia*) were among the Crested Tern but they were not breeding.

Sea Eagles (*Haliaeetus leucogaster*) were observed over West Wallabi and Long Island in 1964, but no eggs had been laid in any of the nests examined. This year, two eagles were in attendance at what appeared to be a Sea Osprey nest but which, on investigation, was found to contain a single white Sea Eagle egg. The nest was a very firm structure of sticks, and stood about eight feet above the pavement limestone ridge on the north east of West Wallabi. Apparently an Osprey nest had been 'taken over' by the eagles.

Just south of the colony of Crested Tern, referred to above, a nest of a Sea Osprey (*Pandion haliaetus*) stood out prominently above the low vegetation. No bird was seen but a clutch of three eggs was present. The eggs were cream with red blotching, and a reddish seaweed formed a camouflage lining in the nest.

These facts were evidence that the occupants were Sea Osprey. A nest on the eastern end of East Wallabi contained eggs in 1964, but was unoccupied when examined again this year.

Pigeon Island was originally named after the Brush Bronze-wing (*Phaps elegans*). None were observed here, possibly because of the intensive settlement, but many were disturbed on East and West Wallabi. Three occupied nests were found on Tattler Island. Single glossy-white eggs were found in two of these nests which had been scraped in the coral grit under bushes and lined with sticks and leaves. The third nest was built in a shrub under a cover of dense foliage. Two fledglings were present.

Little Shearwater (*Puffinus assimilis*) were also found nesting on Tattler Island. Two were banded.

Size: 070; Numbers: 44510 and 44511.

Any soft coral grit on Eastern Island was found to be undermined by the long, shallow burrows of the Little Shearwater. The freshly-excavated burrows were invariably occupied and each contained a single white egg. The birds which were able to be reached in the burrows were banded.

Numbers: 44502 to 44509.

Others were found on Seagull and Pigeon Islands, and two more were banded.

Numbers: 44501 and 44600.

The nesting activity and abundance of the Little Shearwater were not expected as the only two observed in August of 1964 were grounded and in states of apparent exhaustion.

In contrast, was the absence of any large numbers of Wedge-tailed Shearwater (*Puffinus pacificus*). Fresh excavation was common in their large rookeries on West Wallabi but the fresh burrows were rarely occupied. The breeding season was evidently just beginning and was a little later than in the previous year.

A nest of the Painted Quail (*Turnix varia*) was found on the eastern side of West Wallabi. Three eggs were present in the shallow ground depression, partly-concealed by low herbaceous vegetation. It was just north of Slaughter Point in the ecotone near the shore and below the main limestone ridge. A similar nest and location were observed by G M Storr in April, 1960. Another nest of the Painted Quail was seen near Pelican Point.

During a night visit to East Wallabi the nest of an Oystercatcher was found on an inland reef flat near the southern shore of the island. It was quite exposed and amounted to a very shallow scraping in the coarse grit of the reef flat. A few irregularly-placed sticks and a piece of glass comprised the nest. The bird remained on the nest until a close approach was made. It was not positively

identified in the dark. The two eggs were a pale olive-brown ground colour, with irregular dark brown spots and blotches running together at the broad end, and some lighter undermarkings. The nest and eggs seemed to be typical of the Sooty Oystercatcher (*Haematopus fuliginosus*). These birds were observed flying about the anchorage on a few occasions.

In 1964, a nest with two eggs was found on top of one of the unconsolidated coral ridges on Long Island. No bird was seen. This nest also closely fitted the typical nest description by Cayley for the Sooty Oystercatcher — 'shallow depression in the sand, lined with pieces of herbage, dried grass, seaweed, fragments of coral, or broken shells.' However the two eggs were a pale stone colour and seemed to fit the Pied Oystercatcher better (*Haematopus ostralegus*). Pied Oystercatchers were observed along the shorelines of East and West Wallabi.

Flocks of Fairy Terns (*Sterna nereis*) were seen frequently, and Silver Gulls (*Larus novae-hollandiae*) were common. In addition to the Oystercatchers, other waders observed were the Little Stint (*Erolia ruficollis*) and Large Sand Dotterel (*Charadrius leschenaultii*). What appeared to be a Reef Heron (*Egretta sacra*) and Giant Petrel (*Macronectes giganteus*) were seen in the anchorage south of East Wallabi. Welcome Swallows (*Hirundo neoxena*) were seen on a few occasions this year.

MAMMALS

Very little is known of the habits or population density of the indigenous native rodent *Rattus glauerti*. The only islands off the Western Australia coast for which its presence has been recorded are East and West Wallabi Islands of the Abrolhos. We were to spend our five days seeking out this rodent to make a record of its distribution and habits, and to collect ecto-parasites from any which could be caught.

Six live traps were borrowed from the University Zoology Department. Three were lizard traps which were successful in trapping one rodent, and both a King's Skink and Spiny-tailed Skink. The others were mammal box-traps and they too trapped one rodent and a King's Skink. The traps were baited and set on four consecutive nights and visited at daybreak. They were set in a transect, across different terrain, from points along the south-east shoreline of East Wallabi. The first bait tried was bread, cheese, and apple, and later bacon rind was used.

Two rodents were trapped near Eagle Hill on consolidated dune. Numerous ticks and mites were removed from both and transferred, with the aid of fine tweezers, to special small preserving bottles, with alcohol as the preservative. Since the parasites were mammalian ones, care was taken that they did not transfer to human skin or clothing. The animals were released immediately.

The bait used in both successful traps was bacon rind. This may have coincided simply with the area of their occurrence.

This area of dune on the central southern shoreline, and the reef flat to the west were visited also at night. The purpose was to observe the night life with the aid of head torches. Many tammar wallabies (*Macropus eugenii*) were encountered on the high dune of this area, their eyes showing up a very bright red with the torches. Numerous tammars were also found on the western slopes of Flag Hill, on a previous day. A significant feature of our night visit was that no native rodents were seen. Likewise none were observed during daytime work by the reptile, mapping, and physiography groups. It would seem then, from trapping results and day and night observations, that the population of this small reddish rodent on East Wallabi is a very restricted one.

However, a number were seen on West Wallabi and two were actually caught by hand. They have none of the speed or agility of their domestic counterpart (*Rattus rattus*), and are quite easily run down if forced onto open ground. Two were disturbed under a low bush near the shore just north of Mangrove Island. One was caught, and seven parasites removed and preserved. Body length was 135 mms. and the tail stump only 30 mms. in length. Measurements were not taken, but both animals trapped on East Wallabi had shortened tails also. A pair was also disturbed near the Pelican Point settlement when some old hemp rope was lifted. One scampered towards the huts but the second remained at a small hole in the sand and was caught. Ecto-parasites were collected from this fourth one also. Large areas of West Wallabi were not covered so the population may possibly be an abundant one.

The pelage of the rodents captured conformed closely with the description by G M Storr. The long soft hair had 'dark bluish grey bases' and was tipped 'reddish brown on the back and whitish below.' The short hair of the muzzle and limbs was 'whitish.'

Unfortunately, *Rattus glauerti* faces possible extermination by either domestic cats if they are introduced onto the islands, or by the ship's rat (*Rattus rattus*). Spring-back traps set on Pigeon Island killed five of the latter in an hour. Two were preserved in formalin and brought back to the Museum for formal identification. No evidence was found of *Rattus rattus* on either East or West Wallabi but both are relatively easily accessible from Pigeon Island and if it does become established it will rapidly compete out the native species.

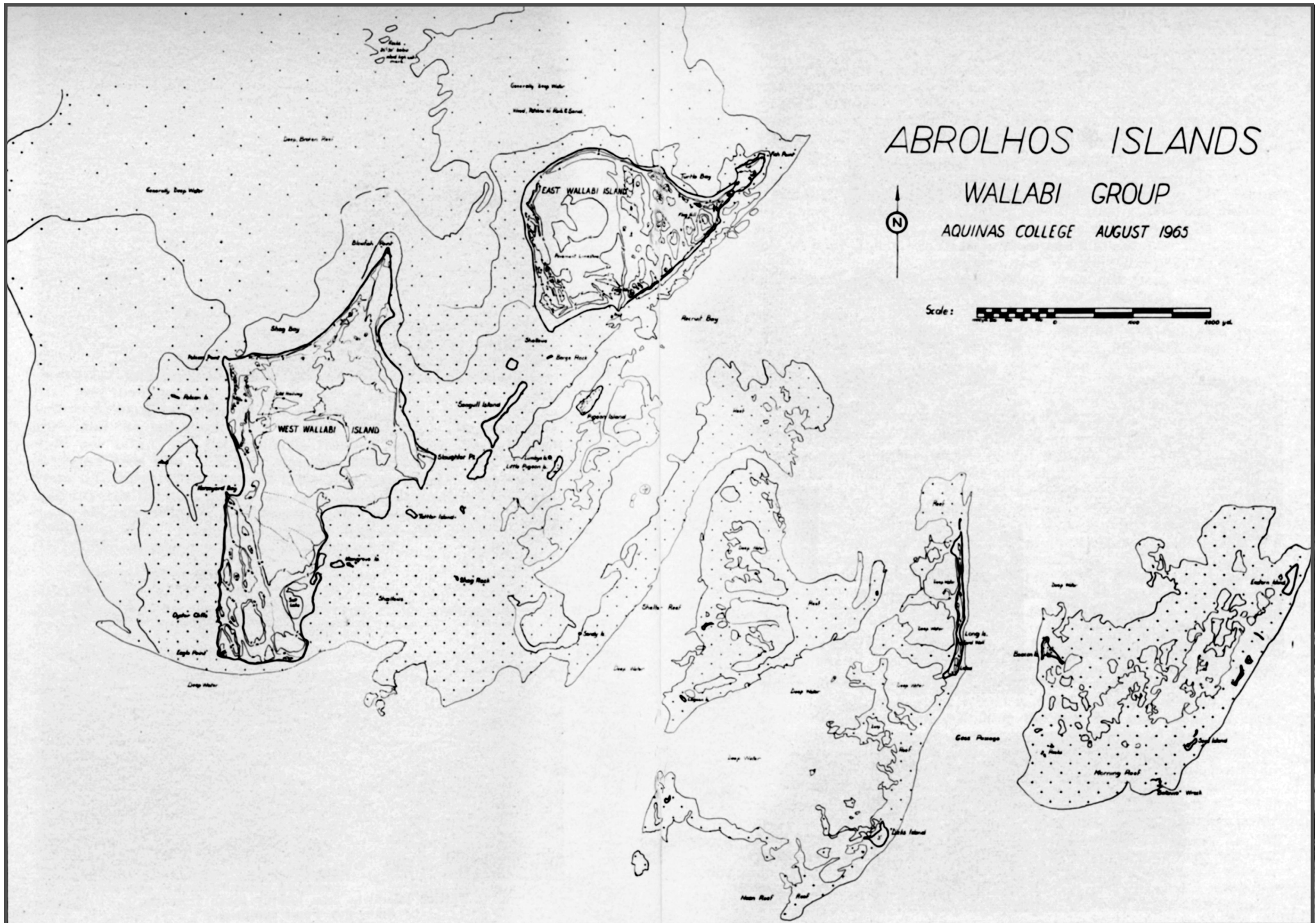
The ectoparasites which were collected are now in the Western Australian Museum awaiting future study. The ticks were provisionally identified, by Dr F H S Roberts, of the Veterinary Parasitology Laboratory in Queensland, as species of *Haemaphysalis*. One species was *Haemaphysalis humerosa*. The mites have not been named.



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

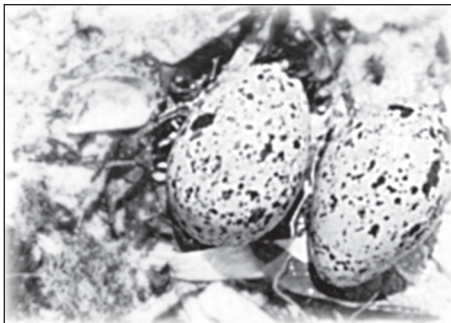
Tattler Island as seen looking south from the Slaughter Point Campsite







Colony of Crested Tern nesting near the salt lake on West Wallabi



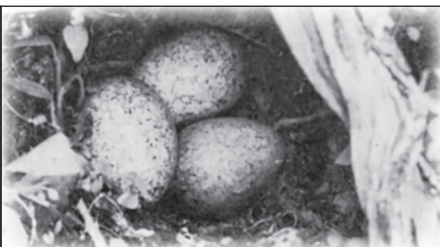
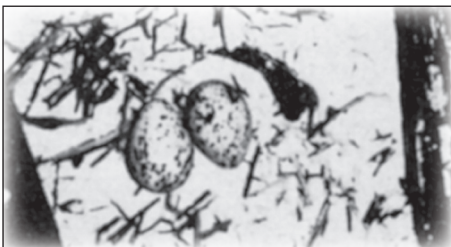
Oystercatcher nest on Long Island



Sea Osprey nest on the eastern end of East Wallabi

Oystercatcher nest on Eastern Island

Painted Quail nest on West Wallabi



REPTILES

The four days in the Wallabi Group were spent observing the reptiles along the eastern side of West Wallabi, over the eastern end and southern shore of East Wallabi, and on Tattler, Seagull, and Eastern Islands. When the reptiles were actually handled, ecto-parasites were collected, and in three cases stomach contents were examined as a beginning to nutritional studies.

The stomach contents were preserved in formalin and brought back from the islands for identification. In two cases the contents were clearly plant floral material and were sent to the Senior Government Botanist for possible identification. The sole stomach contents of a Spiny-tailed Skink (*Egernia stokesi*) from Seagull Island were a number of inflorescences of the annual herb *Senecio lautus* which occurs throughout the Wallabi Group. A Western Jew Lizard (*Amphibolurus barbatus*) examined from West Wallabi yielded an assortment of plant and animal material. An intact insect larva (*Lepidoptera*) and adult insect head parts (*Coleoptera*) were distinguishable, but plant leaf material was not able to be identified. The stomach of a King's Skink (*Egernia kingi*) from Seagull Island contained about eight plant fruits. Their identity was suggested as being possibly fruits of the 'stalked mistletoe' (*Loranthus miquelii*). *Loranthus* is not however listed for the Group and this identity seems most unlikely.

It was not originally planned to collect ecto-parasites from reptiles but, like the native rodent (*Rattus glauerti*), many were found to be hosts to both ticks and mites. Mr L E Koch, Curator of Insects at the Western Australia Museum, had provided prepared preserving bottles for the rodent parasites so many were collected from the reptiles also. They are now in the Western Australia Museum awaiting further study. Provisional identification of the ticks was made by Dr F H S Roberts, of the Veterinary Parasitology Laboratory in Queensland. A Western Jew Lizard, Spiny-tailed Skink, and Lesueur's Skink (*Ctenotus lesueuri*) were all hosts to the tick *Amblyomma* near *albolimbatum*. The typical male of the species is evidently much larger. Other ticks taken from Western Jew Lizards, Spiny-tailed Skinks, and Carpet Snakes (*Python spilotos*) were species of *Amblyomma*. Mites were collected from a Spiny-tailed Skink and two White-spotted Geckoes (*Phyllodactylus ocellatus*).

In visiting Eastern Island it was anticipated that no reptiles would be found. This had been the case on Long Island in 1964. The fauna and flora of East and West Wallabi and their adjacent islets is a surviving mainland one. That of the eastern islands has been established by transmarine migration from either the mainland or the older islands to the west. It was surprising then to find a well-established population of skinks on Eastern Island. It was even more unusual that they should be *Ablepharus greyi*. It has never been recorded for the Abrolhos and, although widespread in the State, is mainly an inland species. If it has not survived on East or West Wallabi since their separation from the main-

land, then it has in some way colonized Eastern Island across Geelvink Channel. This small skink was very elusive and the unconsolidated coral of most of the island provided a secure refuge for it. However one was caught on the coral grit near the centre of the island and its identity was confirmed by the Curator of Reptiles in the Western Australia Museum, Dr G M Storr. The specimen captured is now in the Museum collection.

Only two specimens of the Scale-footed Lizard (*Delma fraseri*) have been collected on the Abrolhos. Both were taken on West Wallabi by W B Alexander. We found a single specimen on East Wallabi at Fish Point, under a piece of coral. G M Storr collected two specimens of *Gehyra variegata* from West Wallabi. We found a single specimen of this gecko on East Wallabi. A third uncommon find was that of *Rhynchoelaps bertholdi*. This Bandy Bandy was unearthed by the historical group when sieving at the Slaughter Point campsite of Wiebbe Hayes. That the only sand being sieved in the whole of the Wallabi Group yielded a specimen of *Rhodona nigriceps* in 1964, and *Rhynchoelaps bertholdi* in 1965, suggests that these burrowing reptiles may be fairly common.

The following is a summary of all reptile observations made during our 1965 visit:—

Rhynchoelaps bertholdi – Small, venomous Bandy Bandy snake found burrowing in sand on West Wallabi.

Python spilotos – Carpet Snakes were found on East and West Wallabi and Seagull Island; all were hosts to ticks.

Ablepharus greyi – Abundant on Eastern Island.

Ablepharus boutoni – Small skink found on Seagull and Pigeon Islands.

Ablepharus lineocellatus – Small skink abundant on East and West Wallabi.

Egernia stokesi – Spiny-tailed Skinks were common in all localities on East and West Wallabi, Seagull and Tattler Islands; most had ticks and mites; one had an olive-brown body colour with no white markings.

Egernia kingi – King's Skinks were common in all localities on East and West Wallabi, Seagull and Tattler Islands; ecto-parasites were present on those captured but none were preserved.

Ctenotus lesueuri – Most abundant on Seagull Island but present on Tattler Island and East Wallabi also; ticks were collected from a Lesueur's Skink.

Lialis burtoni – Only two specimens of this Snake Lizard were found; in pavement limestone on East Wallabi.

Delma fraseri – Single specimen of this Scale-footed Lizard from Fish Point on East Wallabi.

Amphibolurus barbatus – Most abundant reptile; observed in all habitats on East and West Wallabi; ticks were common.

Gehyra variegata – Single specimen from East Wallabi.

Phyllurus milii – Barking Lizards were fairly common on East Wallabi and Seagull Island.

Phyllodactylus marmoratus – Present on Seagull Island, Tattler Island and West Wallabi, but this Marbled Gecko was not common.

Phyllodactylus ocellatus – White-spotted Gecko was moderately abundant on Seagull and Tattler Islands but only one specimen was seen on East Wallabi; mites were collected from two of these geckoes.

Diplodactylus spinigerus – Two Soft-spined Geckoes were identified on East Wallabi.

Sixteen different species of reptiles were observed. This number includes a new species for the Group, *Ablepharus greyi*. No specimen of the *Rhodona nigriceps* observed in 1964 was seen this year. Three species have been definitely recorded for the Wallabi Group which were not seen in either 1964 or 1965. They are the skinks *Rhodona praepedita* and *Ablepharus elegans*, and the gecko *Heteronota bynoei*.

VEGETATION

Eastern Island is typical in appearance of the small, low islands which have grown up on Morning and Noon Reefs. It is also the most easterly of the many islands of the Wallabi Group and is remote from habitation. The nearest fishermen's huts are on Beacon Island. During a day spent on Eastern Island surveying the physiography and fauna, a complete vegetation collection was made.

The island is about four hundred yards long and on an average about one hundred yards across. It rises to a uniform height of about six feet above the Morning Reef coral platform. The latter is emergent at low tide and continues south west through a series of small islands for more than a mile to Seal Island. Eastern Island itself consists of an accumulation of heavy coral pieces and shingle, with some areas of coral sand in the centre. The sand is stabilized by a vegetation cover but all the coral shingle is unconsolidated.

Late August is probably ideal for a vegetation survey as annuals were in full flower or setting seed. Plants were pressed and identified at the Department of Agriculture by the Senior Government Botanist, Mr R D Royce.

Five woody perennials are established on the island. They grow to a height of no more than two feet. The most abundant is the saltbush *Atriplex cinerea* which grows on both the unconsolidated coral and coral sand. Abundant on the heavy, loose coral was the shrub *Nitraria schoberi*, and growing amongst it the thin shrub *Enchylaena tomentosa*. Also fairly abundant on the loose coral was the shrub *Myoporum insulare*. The fifth woody perennial, *Threlkeldia diffusa*, was also common. *A. cinerea* is listed by G M Storr for North Island and East Wallabi but was not collected on Long Island in 1964. *E. tomentosa* was likewise

not collected from Long Island but is listed for North, Pelican, Mangrove, and Pigeon Islands. *T.diffusa*, *N.schoberi*, and *M.insulare* were collected from Long Island and are listed for East and West Wallabi.

Three other perennials were collected. Only a few plants of each were seen. All were collected in 1964 from Long Island and are listed for the other islands of the Wallabi Group. A few tussocks of *Spinifex longifolius* were growing near the water in coral shingle. Pig-face (*Carpobrotus aequilaterus*) was likewise growing on loose coral, its flowers both purple and white. Some isolated plants of the tall perennial herb *Lavatera plebeia* were growing in the deeper coral grit.

Lepidium pseudo-ruderales was one of three of the Cruciferae collected. 'This annual is not listed by G M Storr for the Wallabi Group. *Cakile maritima* and *Hymenolobus procumbens* are both listed but the latter was not collected from Long Island. Of these three annuals only *H.procumbens* was moderately plentiful.

In addition to the spinifex, a few plants of the grass *Bromus mollis* were established on the more sheltered lagoon side of the island. It has not been recorded previously for the group. *B.gussonii* was collected on Long Island in 1964, and *B.arenarius* is listed for East and West Wallabi

Two species of the Compositae were found. The thistle *Sonchus oleraceus* was growing on loose coral, and *Senecio lautus* was abundant in the coral shingle. It is of interest that the yellow florets of *Senecio lautus* were the sole contents of the stomach of a Spiny-tailed Skink taken from Seagull Island. The shrub *Olearia axillaris* was collected from Long Island in 1964 but was not present on Eastern Island.

Very common in the centre of the island in the deeper coral grit was the annual herb *Parietaria debilis*. This area is a rookery of the Little Shearwater. Also abundant in this area was the succulent *Cryophytum crystallinum* with its striking 'crystalline' leaf-surface deposits. Both these annuals were collected from Long Island. The remaining species found, *Salsola kali*, was also amongst the Long Island flora.

Thus of the seventeen plants collected on Eastern Island, five were established woody perennials dominated by *Atriplex cinerea*, two (*Lepidium pseudo-ruderales*, *Bromus mollis*) were not listed previously for the Wallabi Group, and in addition to these two three others (*Enchylaena tomentosa*, *Atriplex cinerea*, *Hymenolobus procumbens*) were also absent from the collection of nineteen species taken from Long Island in August, 1964. The height of the vegetation did not exceed two feet.

Mangroves growing near West Wallabi were examined for evidence of nesting birds. None was found. Within the Wallabi Group the typical location of the mangrove clumps is on the northwest side of the islands off the east

coast of West Wallabi. These islands lie well inside the protective Evening and Noon Reefs to the south, and have the shelter of West Wallabi to the west and extensive reef flat to the east. To the north, Tattler and Mangrove Islands are again protected by West Wallabi; while Seagull Island is more exposed. In the excellent shelter of the shoreward sides of Mangrove and Tattler Islands fine coral mud has deposited on the shallow reef flat, and good clumps of mangroves (*Avicennia marina*) are established. Seagull Island is less favourable but two small clumps have developed on the westward side.

PHYSIOGRAPHY

Noon and Morning Reefs are broad, parallel reef platforms of consolidated limestone which define the south-east margin of the Wallabi Group. Long Island and Eastern Island lie on the northern ends of these reefs, and Dick's and Seal Islands occupy similar locations on the southern extremities. Long Island was visited in 1964 and, as was anticipated, Eastern Island was found this year to be quite similar.

Five small islands have grown up by coral accumulation on the Morning Reef platform. The reef itself is about two hundred yards wide and stretches for more than a mile along the eastern side of an extensive lagoon. It is emergent in many places at low tide, and the full length of this part of the reef can be traversed by wading along its shallows. Its surface is pitted and is an extensive habitat of the sea urchin *Echinometra mathaei*.

'There is no tendency for coral or shell fragments to accumulate on the extensive areas between the islands. Aggradation processes do seem to be at work on Eastern Island, however, the material predominating being the coral *Acropora*. The pieces of *Acropora* vary considerably in both size and shape. Heavy fan and dish-shaped pieces are up to two feet in diameter. The broken branches of the Staghorn Coral species of *Acropora* are plentiful. Along the southern end of the island the shells of the gastropod *Tectus obeliscus* comprise up to a fifth of the unconsolidated limestone. There is some regularity in the deposits along the exposed eastern shore. At intervals of about fifty feet, heavy fan-shaped pieces alternate with very small broken cylindrical pieces. No shells are amongst these accumulations. At the northern end of Eastern Island coral grit is present quite close to some of the largest pieces of *Acropora*.

At a point on the north-west shore degradation processes may be at work. Some old consolidated limestone reef is exposed. Like similar exposures on Long Island, this limestone is above the level of the surrounding reef. The accumulation of coral and shell of these islands appears to be protecting the underlying reef from planing processes which have already reduced the level of the surrounding reef platform by more than a foot.

Erosive action is clearly at work on a small island immediately south of Eastern Island. The loose coral is not in the form of sloping ridges of accumulation, but appears to have been undercut by wave action. Overhanging shrubs are breaking away as the loose coral under them is eroded away. As with Eastern Island, there is some deep coral grit on the island with Shearwater burrows present. The island is already reduced to a thin ridge, broken at two points. It seems that the remaining coral and vegetation may be completely removed by a few storms. Once again, the higher level of the underlying reef suggests that it has been protected by this seemingly short-lived island.

Eastern Island contrasts in two ways with Long Island. Its loose coral ridges are not as numerous, nor is it as high. Two ridges only are distinguishable. They face the open sea and run parallel to the shore on the eastern side. Their height is no more than six feet above sea level. Ridges such as these could represent two cycles of accumulation, or, more likely, two severe storms during which extensive accumulation occurred. The fact that Long Island is higher, and has more ridges, indicates that it is older than Eastern Island. No emergence has occurred in the case of Eastern Island. Teichert suggests that 'beach ridges' build up to heights of about six feet. The greater heights of Long Island, however, would require some emergence. In describing Long Island, Dakin considered that a slight elevation had played some part in its formation, in addition to the accumulation of coral fragments by waves. There is no reason stated.

MAPPING

The initial purpose of the mapping group was to produce a contour map of East Wallabi based on elevations sighted over an extensive grid. The difficult terrain, and lack of time, frustrated this purpose. However, with the assistance of the Photogrammetric Section of the Lands Department, a more accurate map of the Wallabi Group was produced from aerial photographs. Contours, elevations, and other features can be read from the large scale map now available for any future biological, physiographical, or historical studies.

ECHINODERMS

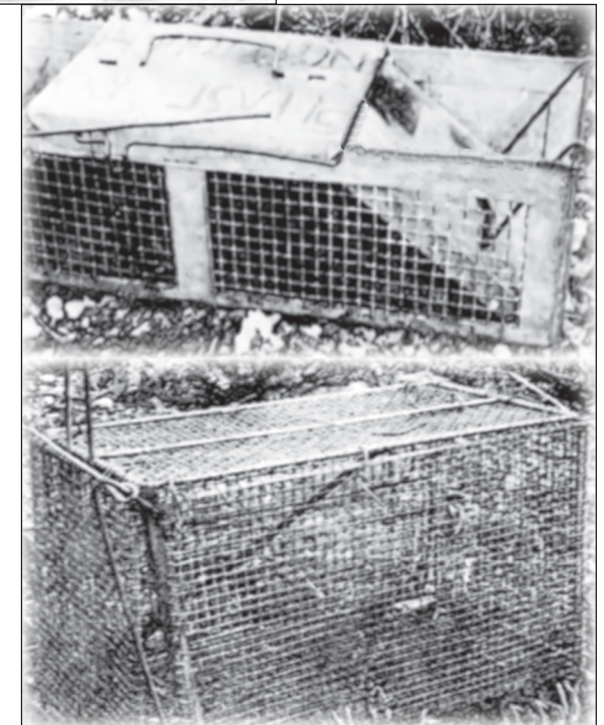
Following a request by Miss E C Pope, Curator of Echinoderms at the Australian National Museum in Sydney, the primary aim of the marine group was to visit as many locations in the Wallabi Group as possible to preserve representatives of all echinoderms which could be found. Holothuroids were preserved in plastic bags in neutralized formol-seawater. All others were narcotized by epsom salts, temporarily preserved in plastic bags in neutralized formol-seawater, and then air dried. Asteroids were identified, and some specimens retained, by Dr E P Hodgkin, of the Zoology Department of the Western Australia University. Specimens representative of all echinoderms

Native rodent caught by hand on West Wallabi.



Ecto-parasites being removed from a native rodent trapped on East Wallabi.

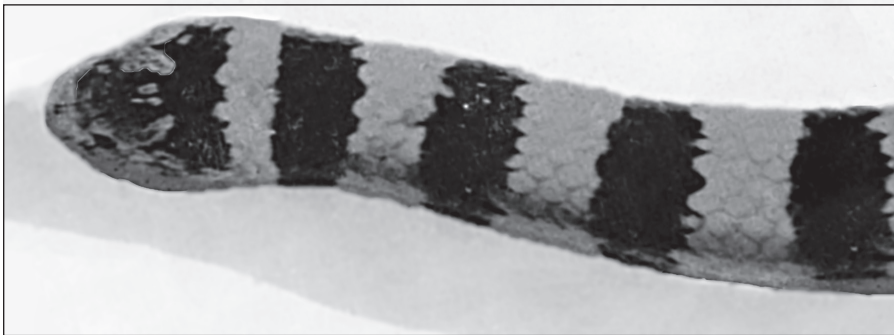
Lizard and mammal traps used for the native rodents.





Typical large
Carpet Snake
(*Python spilotes*)
found on West Wallabi

Below:
Bandy Bandy
(*Rhynchoelaps
bertholdi*)
found in the Slaughter
Point Campsite



Scale-footed Lizard
(*Delma fraseri*)
found on Fish Point

found were sent to the National Museum and the identification of some is still awaiting the necessary examination by experts.

ASTEROIDS

To the south and east of Pigeon Island seven specimens of *Fromia andamanensis (elegans)* were found in about three fathoms of water on exposed sandy bottom with sparse algal growth. They were red with a black pavement outline and the tips of the arms dark. Three were found in 1964 on a similar exposed sandy bottom but in only three feet of water off Long and Beacon Islands. However, the lagoon-like formations in the vicinity of Pigeon Island were the only places in which any were seen this year.

In the shallows, under undercuts, along the eastern shoreline of Pigeon Island, and in rock pools in the shallow reef near Mangrove Island, the sea-star *Parasterina crassa* was found in abundance. The colour was a mottled bluish-green. In view of their abundance in these two locations it is surprising that none were collected the previous year.

Both *Asterina burtonii* and *Ophidiaster confertus* were collected in 1964 and again this year. *Asterina* was found only in the shallows east of Pigeon Island. Specimens were relatively large and were fawn in colour. The unequal arm length of *Ophidiaster* specimens again conferred a 'comet' appearance. Three of the five collected were host to boring gastropods. All specimens of *Ophidiaster* were fawn in colour and all were found under pieces of dead broken coral off the western shore of Eastern Island.

Coscinasterias calamaria was found in most locations at depths of up to about eight feet. It was usually on the limestone reef or on dead pieces of coral and, like the other echinoderms observed, never on living coral. Specimens were a mottled reddish brown in colour, and were observed at Sandy Island, Shag Rock, the shallows near Mangrove Island, the old guano jetty near Pelican Point and Eastern Island.

Two specimens of *Gymnanthenea globigera* were found on the western side of Long Island in 1964 but none were found this year.

CRINOIDS

Two feather-stars were collected from Sandy Island. A number appeared when a piece of decaying limestone was broken up under water. Some were golden, others black in appearance. They have been provisionally identified as *Comanthus parvicirra*.

ECHINOIDS

Extensive colonies of the sea-urchin *Echinometra mathaei* were found on Morning Reef south of Eastern Island, near Eagle Point and Mangrove Islands, and under the undercut at the eastern end of Pigeon Island. Colours ranged from dark brown through flesh pink to green, and each sea-urchin was secure in a pit in the limestone either on the open shallow reef or under the undercuts.

A single small pink and white echinoid was found in the shallows off the eastern end of East Wallabi. It was *Amblypneustes pallidus subglobosus*.

The third sea-urchin collected was also a single specimen taken from the north-eastern end of Pigeon Island. It was amongst broken pieces of coral in about three feet of water. The overall colour was fawn and the relatively short spines were pale pink. The test was relatively large, being about six inches in diameter. It is awaiting identification.

HOLOTHUROIDS

Specimens of five different types of holothuroid were collected but none have been formally identified to date. They did not include *Holothuria edulis* which was collected from the western side of Long Island in 1964.

The most unusual of the holothurians was found in the sandy shallows off West Wallabi near Pelican Point. They were noticed only late on the day on which this area was visited. They were up to 150 mm. long and 30 mm. in diameter. Colour was a very deep brown to black, with five distinctive parallel white markings running the length of the body.

A large black holothurian was found on coral shingle off Eastern Island. The very firm body was 300 mm. long and 150 mm. in diameter. It was possibly *Actinopyga nobilis*.

Large numbers of a smaller black species were found in the shallows, amongst sparse weed and coral shingle, at Eastern Island, Pelican Point, and south of Pigeon Island. Average size was about 250 mm. in length and 40 mm. in diameter. The general appearance was very dark brown to black with reddish protuberances on the back and numerous tube feet on the sole. The provisional identity is that of *Holothuria coluber*.

A species of similar general form and size to those of *Holothuria* was also abundant, and was collected from Eastern Island, Pelican Point, and south of Pigeon Island. Colour was a distinctive tan, and the habitat of this species of *Stichopus* was similar to that of *Holothuria*.

The fifth holothurian was also abundant but its presence seemed to be confined to the more southerly parts of the Group. It was collected from

the shallow reef flats near Mangrove Island and Shag Rock, and from about a fathom of water off Sandy Island. The form was worm-like and sizes were up to 300 mm. long and 10 mm. in diameter. The light brown colour was mottled with white markings. The skin was very 'sticky' to the touch and there was a ring of branched tentacles at the mouth end. The form is typical of *Synapta*.

OPHIUROIDS

Very large numbers of brittle-stars were present on the shallow reef near Shag Rock. Most numerous was the large dark brown *Ophiocoma brevipes*. It was also found under pieces of dead coral at Eastern Island. The smaller *Ophionereis schayeri* with its cream colour and brown bands on the arms, was also found at both Shag Rock and Eastern Island.

A small ophiuroid, which appeared to be *Ophiactis savignyi*, was found at Shag Rock and in large numbers at Eastern Island. It was banded green and brown. The identification has yet to be made.

What seemed to be a specimen of *Ophiocoma parva* was also collected from Eastern Island but it too has still to be formally identified.

All the above brittle-stars were found off Long and Beacon Islands in 1964. Two specimens of a fifth species were collected this year. One was from Shag Rock and the other from Eastern Island. Each was similar in type to *Ophiactis savignyi* but they have yet to be identified.

MARINE INVERTEBRATES

Incidental to the observation and collection of echinoderms, some members of the marine group recorded what molluscs and coelenterates were seen. No formal collection or identification was made, so that names used in this account are based on comparisons with diagrams and descriptions in the available texts.

The reefs of the Wallabi Group abound in magnificent coral growths. Most common are the many species of *Acropora*. The colour ranges from deep purple to pale mauve, and the forms are branched, fan, or disc shaped. *Heliopora* was seen frequently, and brain corals were common amongst the growths of *Acropora*. A species of the soft coral *Xenia* was found near Eastern Island. It was bluish-green in colour with polyps always extended.

The shallows around Eastern Island were populated by very large numbers of anemones. *Actinia* and *Oulactis* were both abundant. Quite large anemones were found at Pelican Island. They were up to nine inches in diameter and of a brownish green appearance. They were not identified, nor was a brownish

anemone with mauve tentacles which was found in large numbers on a reef just west of Pelican Point. Actinia was not seen here.

No chitons were observed in 1964 but this year two individuals of a worm-like species were found. They were under pieces of dead coral in the shallows off Pigeon and Mangrove Islands. The larger was more than three inches long, and each had a very large fleshy girdle with the very small valves well separated. They were probably a species of the naked chiton *Cryptoplax*.

In addition to a common octopus, thought to be *Octopus cyaneus*, two specimens of a small brown octopus, covered with bright blue rings, were seen. It was probably *Octopus lunulatus*.

The West Australian Sea Slug (*Glossodoris westraliensis*) was readily identified by its striking blue, black, and orange colours. This nudibranch was recorded in 1964 also. One specimen of a uniform brilliant red colour was found which could not be identified. It appeared to be a Side-gilled Slug and was relatively quite large, being about eight inches long.

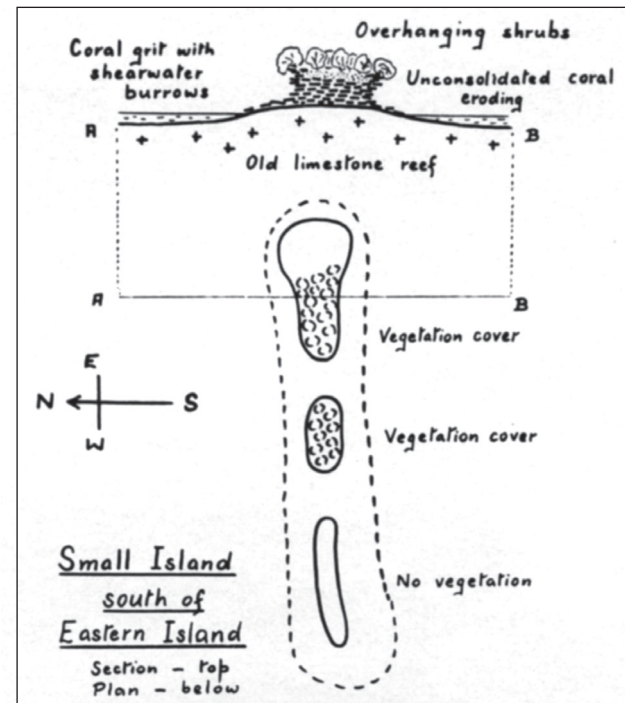
Traps set in the shallows around Pigeon Island attracted *Dicathais aegrota* and the sea-star *Coscinasterias*. Both were found on the traps and the sea-star *Parasterina* was found in the vicinity of two of them. Mr J Lucas collected eggs of *Dicathais* for study at the University.

An interesting gastropod was ultimately found in the echinoderm collection. It was a very small parasitic mollusc found in the sea-star *Ophidiaster*. Only the tops of the conical shells were showing.

Three cowries were observed. The Serpent's Head (*Ravitrona caputserpentis*) and Milk-spotted (*Mystaponda vitellus*) Cowries were common on the reefs, but only a few specimens of the Money Cowry (*Monetaria moneta*) were found. They were at Mangrove Island.

Three other gastropods found in abundance on most reefs were *Tectus obeliscus*, *Senectus intercostalis*, and *Ninella torquata*. Along the inter-tidal undercuts the periwinkles *Melanerita melanotragus* and *Melaraphe unifasciata* were abundant in places. Less common gastropods which were found and identified were *Strombus floridus*, *Chrysostoma obtusa*, *Cerithium fasciatum* and *C. echinatum*, and *Cymatium rubercula*. Several specimens of the Southern Baler (*Melomiltonis*) and Angus's Sea Hare (*Aplysia angasi*) were found on the reefs.

Apart from mussels, the predominant pelecypod was the rock oyster *Saxostrea*. They are especially plentiful in the inter-tidal zones around the southern end of West Wallabi. No specimens of the Black Lip Pearl Shell (*Pinctada margaritifera*) or Painted Pearl Shell (*Pinctada fucada*) could be found although single specimens of each were found in 1964.



Unconsolidated coral being eroded



Typical 'beach ridge' of loose coral fragments

Marine group
moving across shallow reef



Below:

Holothuroid common on the reefs between Mangrove and Sandy Islands



Below Left:

Brittle-star (*Ophioneis schayeri*)

Brittle-star (*Ophiocoma brevipes*).

Below Right:

Sea-star (*Parasterina crassa*).

Sea-star (*Asterina bartonii*).



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