

Notes on the

PHOENIX ISLANDS



The China Mail: 11.4.1867.

SHIPWRECK. - INCORRECT CHARTS. - The British barque Golden Sunset, 628 tons, of Liverpool, Edward Hudson Titmarsh, master, sailed on the 10th of November, from Newcastle, New South Wales, laden with coal, and having twenty passengers (of whom ten were children,) and a crew, masters and mates included, of eighteen men. On the 10th of December, made Birnie's Island, one of the Phoenix group, and on the following morning, at about two o'clock, the weather being very thick, she struck on the reef of Enderbury's Island. Everything possible was done to save the ship, but it was useless. The passengers and crew with the exception of one seaman, unfortunately drowned when the gig was capsized by the heavy surf, were landed in safety. The loss of the ship is attributed to the incorrectness of the charts of this group of islands. The existence of Phoenix Island, one of the group, is, in the English Admiralty charts, laid down as doubtful, as indeed is Enderbury Island. In the chart belonging to the Captain, Phoenix Island was not laid down at all. The result of a careful enquiry into the circumstances of the wreck, made by the British Commissioner, is to exonerate the Captain and officers from any charge of carelessness in the management and navigation of the ship.

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NOTES ON THE PHOENIX ISLANDS

(Wilkes, Charles, Narrative of the United States Exploring Expedition, during the years 1838, 1839, 1840, 1841, 1842, vol. III, Philadelphia, 1844, pp. 388-

[August, 1840][On board the Vincennes]

On the 19th, we made an island in the neighbourhood of the position assigned to Kemins' or Gardner's Island. Its true place is in latitude  $4^{\circ} 37' 42''$  S., longitude  $174^{\circ} 40' 18''$  W.. This is a low coral island, having a shallow lagoon in the center, into which there is no navigable passage; but the reef on the western side is so low that the tide can flow into the lagoon.

When near enough to the island the boats were lowered, and a number of officers and men landed, after passing for a considerable distance through a dangerous surf, breaking with violence over the part of the reef through which the tide flows into the shallow lagoon. The remainder of the reef which forms the island, is white coral sand, about three hundred feet wide, on which there is a vegetation that, unlike that of other low islands of Polynesia, is devoid of low shrubbery.

Birds were numerous on the island, and very tame; the tropic-birds so much so that some of the sailors amused themselves by collecting their beautiful tail-feathers, which they twitched from the bird while it sat on its nest,-- an operation which the bird often bore without being disturbed.

Besides birds, a large rat was found on this island.

The flood here sets strong to the northward, and the rise and fall of the tide was four and a half feet. No coral blocks were seen on this island, and it is less elevated above the water than those further to the eastward. The soil, however, appears to be better than upon those, the coral sand being finer, and mixed with a great quantity of vegetable mould. To this may be ascribed the larger growth of the trees upon it, which, although of the same kinds as those which have been already mentioned as found growing on the coral islands, are forty or fifty feet in height. The island may be seen on a clear day at the distance of fifteen miles.

Believing this to be the island discovered by Captain Gardner, I have retained his name.



Here we made observations of magnetic declination, inclination, and intensity; after completing which we passed through the surf without accident, and on reaching the ship filled away, and stood on our course.

The dip was  $7^{\circ} 39'$  S., the variation  $7^{\circ} 26'$  E.

Light winds continued to blow from the eastward: we held our course to the northward. At ten on the morning of the 19th, breakers were discovered from the masthead, and by noon a small island was seen, to which I gave the name of the man who first saw it, -- M'Kean's Island. In the afternoon, boats were despatched to survey it.

M'Kean's Island is composed of coral sand and blocks, and is three-fourths of a mile long, by half a mile wide. It rises twenty-five feet above the level of the sea, and has upon it no vegetation except a scanty growth of coarse grass. The surf was too heavy to permit a landing.

Our observations place M'Kean's Island in longitude  $174^{\circ} 15' 26''$  W. and latitude  $3^{\circ} 35' 10''$  S., and it lies about north-northeast sixty miles from that of Kemins.

The upper stratum of clouds was perceived to be moving to the westward with much rapidity, yet we had little wind below.

On the beginning of the 21st we had showers of rain, accompanied with a light wind from the westward, and the weather was much more comfortable than it had been for the last few days. During the latter part of the day a quantity of rain fell - 5.2 inches. The temperature of the rain-water was  $62^{\circ}$ . This rain destroyed all our wind, but it came out again from the northward and eastward, with beautiful clear weather. The upper stratum of clouds was moving from the east-northeast. We caught a porpoise this day, differing somewhat in species from any we had yet seen.

On the 23rd we again had a light breeze from the northward and westward, and, what surprised me, a heavy, disagreeable, rolling sea from the southwest, toward which quarter we experienced a current of some strength.

On the 24th, while steering for Sydney Island, we had baffling airs; the swell left us, and we found the ship more comfortable. On the 25th, we had no wind, but



experienced thunder, accompanied with a little rain. The tropic-birds were screaming around us at night, and tern were seen during the day.

On the 25th we again had thunder-showers from the northeast, [p.390] succeeded by light winds from the eastward, the upper stratum of clouds continuing to fly from east-by-north.

On the 26th we made land, which proved to be a lagoon island, about sixty miles to the westward of the position of Sydney Island. At ten o'clock, being near it, the boats were lowered and sent around one side of the island, while the ship proceeded round the other.

This island was not found on any chart; I therefore called it Hull's Island, in honor of that distinguished officer of our navy. It has no doubt been frequently taken for Sydney Island. Its northwest point lies in longitude  $172^{\circ} 20' 52''$  W., and latitude  $4^{\circ} 29' 48''$  S. To our great surprise, we found on this island eleven Kanakas from Tahiti, with a Frenchman, who had been left there some five months before, to catch turtles, of which they had succeeded in taking seventy-eight. The Frenchman was unwell and we did not see him, but three of the Kanakas came on board and remained a short time. They knew Sydney Island, which they told us lay about sixty miles to the eastward, and also two small islands to the northward, but no others hereabouts. Sydney Island they said they had visited, and that it was like the one on which we found them. Hull's Island has a little fresh water and a few coconut-trees upon it, but offers few inducements to visit it, even for the business of taking turtles. The value of those taken could scarcely cover the expenses incurred, which must have been beyond one thousand dollars, taking into consideration the time spent by the vessel going and returning. They informed us that their vessel had gone to Samoa for the purpose of trading, and that they had been expecting her for some time past.

We now stood for Sydney Island, and ran in the darkness until the screaming of the birds around us, warned me that it was most prudent to heave-to, and await the morning light.



The morning proved squally, no land was in sight, and the wind was strong from the eastward. No observations could be taken at noon, and soon after that hour land was discovered from the masthead, bearing northwest, which proved to be Hull's Island, showing that we had been strongly affected by a southwesterly current. I now saw that to attempt to reach Sydney Island, with the wind as we then had it, would occasion much loss of time; I determined, first to search for these islands said to lie to the northward. With the wind at east-by-south, we stood to the north, and at daylight saw an island twelve miles to the westward, [391] which was Birnie's Island. At ten o'clock we made another island, Enderbury's, which our observations placed in latitude  $3^{\circ} 08' S.$ , longitude  $171^{\circ} 08' 30'' W.$

On the latter island we spent the most of this day, making observations for dip and intensity. As it was somewhat peculiar in appearance, we made a particular survey of it. It is a coral island with a dry lagoon. The usual shore coral reef, which is from thirty to one hundred and fifty feet wide, surrounds it, and extends a short distance from its points; its greatest height above the shore-reef, was found to be eighteen feet; it is almost entirely composed of large coral slabs, intermixed with sand: the slabs have the sonorous or elinky sound heretofore noticed, and are likewise of compact coral rock. The bottom of the lagoon is entirely formed of these, and is in places below the level of high tide. The slabs are thrown and piled in all manner of ways, and are generally about the size and thickness of tombstones. They have the appearance of having once formed an extensive pavement that is now broken up in all manner of ways, and would, if laid down, cover, according to estimation, a much larger extent than the whole island.

The island was found to be three miles long, by two and a half wide. The southern end is the widest, and on it are two clumps of stunted shrubs, consisting of *Cordia*, *Tournefortia*, *Portulaca*, *Boerhaavia*, &c. The northern end is almost bare of vegetation, with the exception of a small running vine (*Convolvulus maritima*). At this end the lagoon is most apparent. There is a small channel on the eastern side through which the water probably flows when it is unusually high, and fills the lagoon, from which it is gradually evaporated. On the west side of this island we



found a quantity of driftwood, lying just on the edge of the bank of coral slabs. Some of the trunks were very large, being fifty or sixty feet in length, and from two to three feet in diameter. This occurrence of drift-wood would lead to the conclusion, that during the westerly monsoons in these seas, the winds and currents under the equator extend thus far from the more western islands. The locality in which these large trees are found, which show that there is at times a very great rise of the waters, which must submerge the islands altogether. There were likewise rats here, and, as if subverting the order of things, we found their nests built on tussocks of grass, about eighteen inches or two feet high, while those of the birds occupied the ground.

At about four o'clock we were all on board, and stood for Birnie's [392] Island, in hopes of seeing it before night, which we did not succeed in doing, and I was compelled to lay-to, owing to the dangers which were reported to exist. By morning I found the ship had drifted so far to leeward that it was impossible to reach the island without spending much time in beating up.

The wind now hauled so as to give us the hope that we might reach Sydney Island; but owing to its baffling us, and to the current, we fell to leeward a second time. I then stood to the southward, for a supposed reef in latitude 5° S., but none was discovered.

Feeling that it was necessary for us to be making our way to the Sandwich Islands, on account of the shortness of provisions, I tacked to the northward, after having spent thirteen days in the vicinity.

On the 31st of August, we found a current setting thirty-three miles S. 65° W.



NOTES ON THE PHOENIX ISLANDS

(Wilkes, Charles, Narrative of the United States Exploring Expedition during the years 1838-1842, vol.5, 1844, pp.4-5)

On the 9th January, 1841, they [the Peacock and Flying-Fish] made Enderbury's Island, of the Phoenix group, which has before been spoken of, as seen in the route of the Vincennes from the Feejee to the Sandwich Islands.

On the 11th, they made and surveyed Birnie's Island, which lies southwest from Enderbury's, in latitude  $3^{\circ} 34' 15''$  S., longitude  $171^{\circ} 33'$  W. It has an elevation of no more than six feet above the sea; is about one mile long and a quarter of a mile wide, trending almost northwest and southeast. It is but a strip of coral, apparently uplifted, and is exceedingly dangerous to vessels, as it cannot be seen from a distance, and a vessel in thick weather, would scarcely have time to avoid it after it was discovered.

[p.5]

A number of islands and reefs, reported to exist, were searched for in this neighbourhood, viz.: Mary Balcout's, Brothers', Robertson's, Phoenix, Harper's, and others, laid down, but not named, all of which are believed to have no existence whatever.

On the 17th January, they made Hull's Island, which has already been described, and was surveyed by the Vincennes. The party of Tahitians employed in taking turtles had left it. Captain Hudson, believing this to be Sydney Island, ran off forty-five miles to the westward, for Hull's Island, but, of course, saw nothing of it, as it lies that distance to the eastward in the same latitude.

The position of an island supposed to exist in latitude  $5^{\circ} 23'$  S., and longitude  $173^{\circ} 25'$  W., was passed, but no signs of land were seen. They then ran over the supposed place of Fletcher's Island, in latitude  $7^{\circ} 02'$  S., longitude  $173^{\circ} 22'$  W., without seeing any shoal, island, or reef.

The effects of the rainy season were now felt in these latitudes, in sudden gusts of wind, with torrents of rain, that continued for a few hours of the night, and cleared up partially toward toward sunrise, after which the weather continued cloudy throughout the day, with squalls visible in various parts of the horizon.



Our experience corroborated the generally conceived idea that this kind of weather usually occurs near small islands; but that these isolated spots, of such comparatively small size, can exert so great an influence in arresting and condensing the vapour, is not to me a satisfactory explanation. I am rather inclined to believe that it results more from the fact of the high temperature of the ocean in the neighborhood, it being here nearly  $90^{\circ}$ , or several degrees greater than that of any other part of the ocean; consequently, the evaporation would go on much more rapidly, which, becoming condensed in the higher portion of the atmosphere, is again thrown down in copious streams at night. This is particularly the case when the trade winds are interrupted, that would otherwise carry off the vapour. As far as respects the interrupting or arresting of flows of currents, these islands may exert some influence; but the main cause I should be inclined to impute to the high temperature acquired by the water in consequence of there being no currents.



Folder 4.

Phoenix Island

Our present knowledge of the discovery and naming, and of the occupation and use, of Phoenix Island, is summarized below.

Discovery and Name

The discoverer, date of discovery, and source of the name are not known at present. It is reported by name in the Reynolds report, 1828, page 12.

The Hydrographer of the Navy, E.R. Knorr, in a letter to the Secretary of State, April 8, 1868, remarks:

The island reported by the ship Phoenix was searched for by the U.S. Exploring Espn., but could not be found.

This would appear to indicate that the fact that Phoenix Island was discovered by a vessel named Phoenix was known to the Hydrographer, although not necessarily to Lieutenant Wilkes. No reference in Wilkes' Narrative has been found relating to the reported discovery of the island or the source of its name. Wilkes failed to find the island in the position reported and believed it nonexistent (See Wilkes, Narrative, v.1, p.4).

The only vessels named Phoenix which are listed in Starbuck, whose voyages antedate 1828 (Reynolds Report), are the following:

Ship Phoenix of New Bedford, 1822, Captain Worth (Starbuck, 244)

Ship Phoenix of New Bedford, 1824, Captain Stetson (Starbuck, 252)

Ship Phoenix of Nantucket, 1821, Captain David Harris (Starbuck, 236).

There may be significance in the fact that C.A. Williams and Company of New London, Connecticut, (afterwards named the Phoenix Guano Company) filed with the State Department a notice of discovery of guano on various islands, including Phoenix Island. We do not know why the company changed its name to Phoenix Guano Company, nor do we know why the whole group came to bear the name Phoenix. Possibly the log books of the voyages of some of the ships named Phoenix might throw some light upon the origin of the name of Phoenix Island.

History of Phoenix Island

Phoenix Island was known to American whalers and appeared on charts, as indicated above, prior to 1828.

On March 14, 1859, C.A. Williams and Company of New London, Connecticut, filed with the State Department notice of discovery



Boggs: Phoenix Island, cont'd

of Phoenix Island, together with McKean, Enderbury, and Starve or Barren (Starbuck). In an affidavit by Thomas Long, master of the schooner E.L. FROST, in which the discoveries were made, C.A. Williams and the deponents alleged that they landed on Phoenix Island on February 19, 1859, found guano, and took possession of the island in the name of the United States, erected a board with an inscription to that effect, and buried a bottle containing papers proving their landing and possessory acts (manuscript report by Miss Elizabeth Rogers, page 789). Similar information is contained in a manuscript borrowed from Mr William Williams, 20 Pine Street, New York, by S.W. Boggs, on October 20, 1937; this statement, however, indicates that they landed on Phoenix Island on February 9, 1859, and erected a board on which was inscribed:

This Island taken possession of in  
the name of the U.S.A.

C.A. Williams      Thos. Long

Information extracted from "The Friend", published in Honolulu, transmitted by the Commandant of the 14th Naval District of Honolulu in September, 1937, lists at least nineteen visits of American vessels, chiefly guano vessels, to Phoenix Island between November 3, 1860, and April 27, 1871. A second list, which is somewhat similar, appears to indicate other known visits to Phoenix Island, including some in 1859 and others later in 1871. ....

On March 27, 1872, Commander Richard W. Meade, U.S.N., U.S.S. NARRAGANSETT, visited Phoenix Island. Commander Meade reported:

The buildings, flag-staff, and wharf of the Phoenix Guano Company are still standing, but the island has been worked out and was abandoned in August last (1871). I saw no vegetation on the island, except a little grass here and there (Hydrographic Notice No.45. U.S. Hydrographic Notices, from No.1 to 97, for 1872. Washington, 1873, p.1).

In 1889 a British survey of the island was made. See British Admiralty chart No.184; also H.O. chart No.1211 which indicates that it was based upon the British survey.

A British protectorate is reported to have been declared over Phoenix Island on June 29, 1889 (H.O. Pilot No.166, 1933 edition, page 470). ....



Notes from a Memorandum from S.W. Boggs, dated November 13,

in Bryan - Folder 4

Enderbury Island - not listed by name in Reynolds report, 1828, but position of one of the unnamed islands therein reported on page 10 is given as  $3^{\circ} 14' S, 170^{\circ} 50' W$ . This is presumably Enderbury. On some early charts and reports it is called Enderburg.

Island is listed in two positions on two guano bonds. Phoenix Guano Company extracted guano from Enderbury, Phoenix and McKean islands.

McKean Island - certainly known to American whalers long before Wilkes 'discovered' it. The unnamed island listed in the Reynolds report, page 10, in  $3^{\circ} 32' S, 173^{\circ} 44' W$ , is presumably McKean.

Hull Island - not only was the island known to the Frenchman found there, but doubtless also to American whalers prior to 1840. One of the positions of Sydney Island (Sidney's Island), listed in the Reynolds report, page 12, in  $4^{\circ} 29' S, 172^{\circ} 17' W$ , is more likely to refer to Hull Island than Sydney.

Canton Island - reported as 'Mary Balcot's Island' in the Reynolds report, page 12. It is sometimes spelled Bulcot. And on early charts it is frequently named Mary or Swallow.



BIRNIE ISLAND

(H.O. 166, p.470, 1933)

Position:  $3^{\circ} 35' S.$ ,  $171^{\circ} 31' W.$ ; H.O. Chart No. 125.

Located 50 miles westward of Phoenix Island. Discovered by Captain Ement. It is merely a strip of coral and sand, about 1500 yards in length and 500 yards wide, elevated 6 feet above the sea, and trending northwest and southeast. On several of the charts (1925) the island should be 2 miles to the eastward.

The British flag was hoisted and protectorate declared on July 10, 1889, and there were no signs of any former inhabitants. In 1916 the island was leased to Captain Allen for 87 years. It is uninhabited and the fish are poisonous.

There is no anchorage, but landing was effected on the lee side.

Shoal water extends from the north and south points, nearly 1 mile from the latter. The center is occupied by a brackish lagoon, about 6 feet in depth. Some shrubby growth was seen and much driftwood was found.

A beacon, conical in shape, and built of corrugated iron, 30 feet high, and surmounted by a flagstaff, 15 feet high, has been constructed on this island.



PHOENIX ISLAND

(H.O. 166, p. 470, 1933)

Position:  $3^{\circ} 42' S.$ ,  $170^{\circ} 42' W.$ ; H.O. Chart No. 1211.

This, the eastern island of the group, is 1,200 yards long, 1,000 yards broad, and 18 feet in height.

There are no trees on the island, nor any distinctive elevation; it would be almost invisible on a dark night and it is difficult to detect on a cloudy day. The reefs extend from the northwestern and southeastern extremities for about 600 yards.

The British flag was hoisted and protectorate declared on June 29, 1889, and in 1916 was leased to Captain Allen for 87 years.

The island is uninhabited and overrun with rabbits. There are some ruins of a hut and a shed and an old tramway.

The center is occupied by a shallow brackish lagoon, which probably sometimes dries. A fringing reef surrounds the island, in which, on the western side, there is a break, affording good landing.

There is no anchorage. The landing is on the southwest side.

Current: A current of 2 knots was found setting to the westward past the island.



SYDNEY ISLAND

(H.O.166, p.469, 1933)

Position:  $4^{\circ} 27' S.$ ,  $171^{\circ} 16' W.$ ; H.O.Chart No.125. 64 miles eastward of Hull.

Discovered by Captain Emmet. British flag hoisted and protectorate declared, June 26, 1889. In 1916 the island was leased to Captain Allen for 87 years.

The island is 2 miles long and 1.8 miles broad, and 20 feet high; the tops of the trees are 90 feet above the sea. It is of coral formation, surrounding a lagoon with no opening. The reef is steep-to around, except on the west side where there is anchorage. Wild ducks are found on the lagoon.

Current sets to the westward at a velocity of 1 to 1.5 knots.

The island has a number of ancient stone ruins and an ancient fish pond.

On the west side there are some buildings for those living there and there is also a flagstaff.

The guano works are closed, and the island is planted with coconuts. There were 16 natives, all men, and a half-cast overseer, in 1925. About 60 tons of copra are exported annually. The only landing is over the reef abreast the very inconspicuous flagstaff. Fish are poisonous, turtle may occasionally be obtained, and there are a few fowls. There are six fresh-water wells on the island.

A conspicuous beacon, consisting of a post painted white with a triangular top mark, is situated on the shore above high-water mark at the western end of the island abreast the anchorage. A flagstaff is at the western end of the island.

There is also a beacon on the southeastern point of the island which is conspicuous from southward.

Vessels moor off the west side of the island in about 9 fathoms, about 200 yards from the reef, sheltered from the prevailing winds; but from November to April northwesterly winds may be expected. There is nearly always a southerly swell, which causes vessels to roll heavily at times.

Tide: Spring rise about 4 feet.



## HULL ISLAND

(H.O. 166, p.468, 1933)

Position:  $4^{\circ} 30' S.$ ,  $172^{\circ} 12' W.$  H.O.Chart No.125; 142 miles eastward of Gardner Island.

Discovered and named by Wilkes in 1840. British flag hoisted and protectorate declared on July 11, 1889; leased to Captain Allen for 87 years, 1916. Inhabited by Captain Allen's employees.

In 1925 they consisted of 1 American overseer and 14 natives from Union Group, the settlement being situated at the extreme western end of the island, where in ordinary weather landing is made over the reef opposite an inconspicuous flagstaff on the foreshore. A conspicuous white mound surmounted by a white diamond-shaped top mark, stands on the foreshore about 300 yards northward of the flagstaff. There are two wells, one used for drinking and the other for washing water. Green turtle are abundant and there are a few pigs and fowls on the island.

It is quadrilateral-shaped and incloses a lagoon; there are coconut trees on it, about 50 feet high. A coral reef fringes the island and landing is difficult except by entering the lagoon through the boat passage on the northwestern side; the position of the landing place and house of refuge is marked by a flagstaff and cairn.

The west point is in  $4^{\circ} 30' S.$   $172^{\circ} 12' W.$ , but H.O.Chart No.1993 (1903) gives it 1.8 miles to the westward. There is no anchorage.

The spring ~~time~~ rise of the tide is stated to be about 4 feet.



GARDNER ISLAND (Kemins)

(Pacific Islands Pilot, Pt. II. H.O.166, p.462, 1933)

Position:  $4^{\circ} 41' S.$   $174^{\circ} 34' W.$  H.O. Chart No. 125.

Southwestern Island of Phoenix Group; a coral island with a shallow lagoon into which there is no navigable passage. The height, including the trees is 50 feet.

The island is surrounded to a distance of 200 yards by a shallow shelf of hard black rock on which there is a constant surf and heavy undertow. The outer edge of the shelf is almost perpendicular, there being depths of 60 fathoms almost up to the breakers. The shore of the island is of rough coral. Landing on any part of the island is extremely difficult and dangerous, unless made by the most experienced native boat crew. There are a few coconuts on the island and numerous large birds, rats, and large crabs. Both the sea and the lagoon are infested with sharks. There is no fresh water except such as may be found in pools after rains.

A British protectorate was formally proclaimed on Gardner Island on May 28, 1892; in 1916 it was leased to Captain Allen for 87 years, and is uninhabited. The island has been planted with coconuts.

Tides: The flood tide sets strongly to the northward; the rise and fall is about 4.5 feet.



MC KEAN ISLAND

(H.O. 166, p.472, 1933)

Position:  $3^{\circ} 37' S.$ ,  $174^{\circ} 07' W.$ ; H.O. Chart No. 125.

Lying about 67 miles north-northwestward of Gardner Island, was discovered and so named by Wilkes (1840). It is of coral and sand formation, 15 feet high, 1500 yards long by 1,000 yards wide, and covered with bushes; it is leased to the Pacific Islands Co. There is guano on it.

Breakers were observed (October 1923) extending about 500 yards from the northern end and 400 yards from the southern end of the island.

The master of the Norwegian motor vessel Veranger reported (9 Feb. 1933) that from careful stellar observations the southwest point of the island is in  $3^{\circ} 34' 12'' S.$ ,  $174^{\circ} 12' 12'' W.$ , or about 6 miles west-northwestward of its charted position.



## NOTES ON CANTON ISLAND

By H.W. Bigelow, 1939.

Canton Island is the largest and most northern of the Phoenix group. It is a coral atoll, roughly triangular in shape, enclosing a large lagoon, studded with coral heads, and crossed by numerous barrier reefs. The short western or lee side lies north and south, and is about 4 miles in length. The other sides trend southeasterly, and meet about 9 miles from the N.W. point. There are only two openings in the land rim, one, a boat channel, is about a mile north of the S.W. point, and carried about two fathoms into the lagoon, another about a mile north of it dries at low water. The boat channel must be used with caution, due to its narrowness, and the strength of the current (estimated to run up to 6 knots at maximum flood or ebb.) The right hand side of the channel must be held in entering and immediately after clearing the entrance a sharp turn southward must be made to avoid a large coral field.

The land rim of the island consists of a narrow strip of land from 100 to 600 yards wide, and from sea level to 20 feet in height. The island is practically bare of vegetation, except for nine scattered palms, two patches of kou bush, one near the channel and one near the northern point, some *tournefortia* and *scaevola* shrubs, and occasional patches of *portulaca* and other purslane's. The most conspicuous objects are the lone palm on the NW point and a large kou bush on the SW point.

The settlement of the island has changed remarkably in the past year. On our arrival in April, 1939, there was a small settlement near the channel, on the west side, housing the British and American colonists. In May the PAA construction gang arrived, and buildings they have erected have completely changed the appearance of that side of the island. There is now an extensive settlement running all along the west side from the channel entrance to the SW point. There is a light house at the channel, and about half a mile south is a large airway beacon some sixty feet high. There are three radio stations and three weather observatories, one each for British, ~~and~~ American colonists, and PAA. It is understood that the activities of the American colonists will be taken over by the resident force of the PAA upon the completion of their construction work.

There is no fresh water on the island, although there is evidence of an old well on the east side, near an old coral slab pier. The PAA has two large evaporating units and storage tanks, while the British settlement has an emergency evaporator run by a gasoline engine.

The island is very steep to, the coral shield extending only about 200 yards from the shore line, except at the three corners where it extends about 400 yards. Depths outside the reef drop off from 100 to 300 fathoms and more within a few hundred yards. In one instance, the ship was anchored off the channel entrance with ten fathoms at the bow, 40 fathoms under the bridge, and over 100 fathoms at the stern. The surf breaks heavily on the weather side and at the three points.

The lagoon is choked with coral heads and barrier reefs, which may be navigated with care in a small boat, drawing not more than two feet, since the water is very clear, and when the sun is up more than 30° the coral heads are clearly visible.

Off the island there are frequent rain squalls, but rain rarely falls on the island itself, due apparently to the heat rising from the warm water of the lagoon. The wind is mostly from the E. or E.N.E., the Phoenix Islands lying in the most southerly part of the northern trades. I am not entirely satisfied with the explanation for the lack of rainfall, but it is a fact that most rain squalls, which appear to be headed directly for the island, will veer either north or south and pass clear of the island. I have seen a squall appear to split, and pass both north and south, with no rain at all on the island. There is another item, in that the rain squalls are usually accompanied by heavy winds, and therefore what little rain does fall on the island is blown off the roofs and catch basins, and is not caught in the storage tanks.



There are a goodly number of birds on the island, including terns, boobies, frigate and tropic birds. There are lizards, Polynesian rats, and innumerable hermit crabs. The only insects are flies. Fish are plentiful, but those caught in the lagoon must be regarded with suspicion, as some, notably the red snappers, and rock cod are poisonous. The lagoon is infested with sharks, morey eels and rays, making swimming dangerous. Turtles often visit the island to lay their eggs.

Canton appears to have been discovered by whalers, and to have been discovered several times independently, as the several names, "Canton", "Mary", "Swallow", etc., suggest, but it is not known by whom these names were given or when. The island is one of those claimed under the Guano Act of August 15, 1856. Wilkes in his voyages never saw the island, although he visited Enderbury, only forty miles away. There are guano workings on the island, including a stone pier on the lagoon shore of the eastern rim. There is evidence of some buildings near the channel, but they may be either whalers, guano workers, or later visitors. Canton, along with other islands of the group, was leased to Captain Allen, of the Samoan Shipping and Trading Co., in 1915 or '16. It appears that he planted the existing coco palms, and according to the notes on the island in the "Pacific Islands Handbook, 1939" he built a beacon. There are a great many stone cairns on the island, and which of these, if any, is the one he built it is not possible to say. The British flag was planted on the island and a proclamation of British Sovereignty was made by the HMS Leith, Captain Tudway, RM, in 1936. In June, 1937, the island again came into prominence as one of the few sites from which the solar eclipse of the year could be seen. An American expedition on the USS Avocet landed there and established camp. Later the HMS Wellington with a similar party arrived from New Zealand. An international incident occurred when the Commanding officer of the Avocet refused to vacate the only anchorage at the ~~insistent~~ demand of the Commanding officer of the Wellington, who claimed it by right of British sovereignty. The Wellington finally landed the party and laid to without anchoring. The American expedition erected a concrete pier with two American flags inset on the sides, and made an astronomical determination of the spot. A new proclamation was made by the Commanding officer of HMS Wellington of British Sovereignty. In August, 1938, the HMS Leith again visited the island and left two men as colonists, an English radio operator, and a native of the Gilbert islands as his servant. An American party of colonists, including a radio operator and three Hawaiian boys arrived in November, 1938.

Both parties established radio stations, and made weather observations, and made preliminary surveys of the island. Joint occupation, or Condominion, was formally agreed upon between U.S. and Great Britain in April 1939. The USS BUSHNELL commenced a detailed hydrographic survey of the whole area in April, 1939. In May, 1939, the S.S. North Haven arrived with the construction crew of the Pan-American Airways, and the construction of a modern airbase was begun. The first plane flight was in August.

See notes on Canton Island in the "Pacific Islands Yearbook, 1939", p.174 & 387.

See item in "Paradise of the Pacific", June, 1939, p.16. "An other condominion."

See item in "Pacific Islands Monthly", April 17, 1939, p.7, "Another Condominion"; May 16, 1939, p.47, "Americans visit Canton Is."; June 15, 1939, p.6, "Transpacific Air Service", p.14 of the same issue has an item about the PAA construction work.



## NOTES ON CANTON ISLAND

E.J.Witt, April, 1939.

I have not made comments of the character of the various parts of the island of Canton since they are quite well shown on a map by the U.S. Department of Interior Survey July, 1938, "CANTON ISLAND" B-N1-105. Except for a few minor omissions, which the pictures will show, this map is very good for character of detail.

At intervals of about one mile I have tried to get a picture tie in. In some cases it has been very difficult, especially on the NE side, to definitely determine a tie-in point. It is quite possible a couple of my points may be in error.

At every signal I have an elevation - good to the nearest foot, with regard to average water level.

Where there are large groups of bushes, there are countless bird nest and guano deposits.

From the beach seaward to where the breakers show up - all around the island - is fairly flat coral shelf which bares at low water. At the point of the breakers there are found piled up coral boulders.

There seem to be a total of nine grown coco palms, though many very small ones are growing - at present about 18" high.

Below are a few fairly typical cross-sections (Fig. 1, 2, 3, 4.)

To attempt to approach the island from seaward is extremely dangerous. There is just one entrance channel to the lagoon, just north of the camp. There is plenty of water here for small boats, but at full flood and ebb there is a very powerful current flowing. [Estimated to be about 6 knots, HWB]

Coming out of the channel into the lagoon a sharp turn to the right (southward) must be made. Near the camp is very good anchorage.

Except for the clear water at the south end, travel in the lagoon is poor and dangerous due to the numerous coral heads and reefs. We have been able to get around most any part of the lagoon (except directly east of the main entrance channel where there is a large and dangerous coral field) with small skiffs equipped with outboard motors. The water is so clear that the heads may be seen and ducked. In some parts it is necessary to push the boat over a narrow part of the barrier reef.

The lagoon is simply alive with many varieties of fish of all colors, sizes, and shapes. We have seen many sharks, turtles, rays, morays, eels, etc. We do not, repeat not, advise swimming in the lagoon.

Tho the sun gets extremely hot during the mid afternoon, there is a constant easterly wind which makes the place livable.

During the past week we have had considerable rain - tho the colonists tell us that it is the most they have had for several months. Only a few fish are edible, so before eating any variety of fish the advice of the colonists should be had. The island has thousands of birds - mostly boobies, frigate birds, and love terns. Needless to state there is considerable guano. The American colony consists of one white American radio operator and three Hawaiians. The British colony consists of one white British radio operator and one Gilbert islander. But don't come here to live expecting to find a south sea paradise. On lagoon side of the land the light color on the pictures is shallow water, less than three feet deep. Several stone cairns exist in various parts of the island; cuts have been made to many of them, and it is possible that stereoscopic study of the photos may identify them.

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All existing descriptions were written before PAA moved in. The photograph (fig. 5) was taken in May, a day or so before their arrival, the panoramic picture was taken in July and shows the amount of work done at that time. They have completely changed the character of the island, by building a modern settlement on the island, and by blasting a good landing area out of the coral patches in the lagoon. At this time there are three units on the island - each keeping their own time, each maintaining a radio station, and a weather observatory - they are:



(Canton, cont.)

- a. The British settlement at Edinburgh.
- b. The American colonists at Blackville.
- c. The Pan-American plant 100 yards south of the latter.

Edinburgh uses local civil time (ie. Zone 11 1/2). Blackville uses Honolulu time (ue. 10 1/2), while the PAA uses straight Zone time ( ie. 11 hours.)



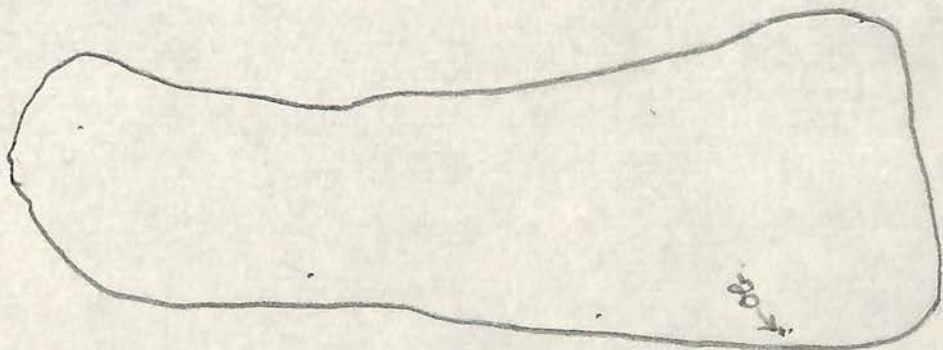
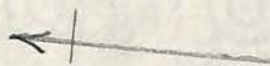
BERNICE P. BISHOP MUSEUM  
HONOLULU, HAWAII.

CURATOR OF COLLECTIONS

Enderbury I.

Scale 1:40,000

Obs Spot.  $3^{\circ}08'30''$   
 $171^{\circ}05'35''$





## BIRNIE ISLAND

(Copy of letter from CO USS Bushnell to Hydrographer, Sailing Directions)

### SAILING DIRECTIONS BIRNIE ISLAND

#### General

Birnie Island (H.O. Chart 125) is a barren kidney-shaped island about 1300 yards long by 600 yards wide, the axis running in a NNW-SSE direction. A shoal, which breaks in heavy weather, extends 1300 yards south from the southern point. The depths on the shoal vary from 3 to 4 fathoms. Depths of 80 fathoms are found 1200 yards NW of the NW point. At other points the 100-fathom curve lays about 500 yards off. The island is 12 feet high on the rim, sloping gradually to sea level at a small shallow brackish pond about 300 yards long by 50 yards wide situated about 100 yards inland from the eastern side of the island. A flat, fringing reef extends about 50 yards around the island, drying at low water.

At the eastern extremity, about midway between the northern and southern points, is a stone monument 16 feet high and 14 feet in diameter at the base. The stones are held in place by an iron framework. The position of this beacon is Latitude  $3^{\circ} 35' 15''$  S., and Longitude  $171^{\circ} 30' 45''$  W.

#### Landing:

Landing may be effected with caution and by skilled oarsmen at a point about midway of the western side just north of a pipe staff.

#### Currents:

Close to the western shore the current sets to the northward. Farther off the set is westerly and is usually about one-half knot, the strength and direction varying with the surface currents set up by the prevailing wind.

#### Tides:

No tidal data was obtainable, but the time of high water is about ten minutes earlier than at Canton Island.

#### Anchorage:

It may be possible to anchor a small vessel off the northwest point about 500 yards, with easterly winds. The southern spit is considered too dangerous as it drops off from two or three fathoms in surf to thirty fathoms within one hundred yards.

#### Fauna:

The only life on the island consists of sea birds, hermit crabs, and Polynesian rats. Fish are plentiful and so far as is known, there are no poisonous species.

#### Flora:

The only vegetation is a wirey grass and some creeping plants of the purslane family.

W. B. COLEMAN.



## NOTES ON SYDNEY ISLAND

(From H. W. Bigelow, 1939.)

Sydney Island is roughly triangular in shape, with a base of about 2 miles and legs about  $1\frac{1}{2}$  miles each. The apex is toward the north. There is a fringing reef about 50 to 60 yards wide, which dries at low water. Off the edge of the reef the bottom drops off very steeply. In the center of the island there is a lagoon which is roughly circular in shape, about a mile in diameter and about 3 fathoms in depth. There is no outlet and it is obstructed by many islets and shoals. The water is unusually salty and is similar to a concentrated brine. Upwelling water was noticed in two locations on the north side of the lagoon, and at numerous points around the edges there is definite evidence of seepage just above the normal water level. A line of levels was run connecting the reef outside ~~the~~ with the lagoon, and it was found that the water surface of the lagoon was 1.6 feet below the level of the reef. From the location and construction of the tramways and dock, it would appear that the water surface of the lagoon was at least a foot higher at the time of the guano work (1860-1890). An old shoreline is readily visible in most parts of the lagoon, which would indicate that lagoon used to be ~~about~~ at least two feet, and probably  $2\frac{1}{2}$  feet above its present level. The shore of the lagoon and of the islets is of mud and guano, which is soft while in contact with the water, but which hardens like cement when dried.

There is a colony of about 130 persons living in a village on the southwest point. They have come from various villages of the Gilbert and Ellice islands. There is an administrative officer, Kima Jack Pedro, a native Magistrate and a radio operator. Pedro, the Radio Operator, and two or three men speak English. The island is under the jurisdiction of the Gilbert and Ellice Islands Colony. Jack Pedro is also Public Works foreman, and is half Tokelau and half Portuguese. He is a brother of Mrs. Jennings, of Swain's Island. He has only recently been appointed as Administrative Officer. The village is well built, and very clean. We occupied the quarters which had been built for the Administrative Officer, at the Gov't. Station, and found them to be the most comfortable quarters which we had had. There is a large three-room house, with a cement floor, the eaves overhang and form a porch, which has been floored like any Polynesian house.

At the time of our visit, in September, 1939, the island was very badly in need of rain. There are some fifteen wells, three of which are new, and all of which are more or less brackish. There is a large cistern, with a capacity of 31,000 gallons, but there has not been enough rain to fill it, and at the time of our visit there was only six inches of water in it. Two houses are equipped with sheet iron roofs and gutters to catch rain.

There is a considerable grove of coconut palms at the village, but they are not thriving due to the lack of rain. There is another stand at the S.E. point which is in even worse shape, and several scattered stands along the south shore. Most of the rest of the island is covered with a heavy growth of brush, standing some fifteen feet above the ground. It is the devil and all to get through. Several varieties were recognized including *kanava*, *Tournefortia*, *Scaevola* - and there were several which I could not identify. *Sesuvium*, *Portulaca* and *Lepturus* were noticed.

There are a large number of structures scattered about the island which were investigated as thoroughly as time and the press of the survey work would permit. The several sites are numbered in the order in which they were discovered, and I have tried to correlate them with the structures found by the Zaca party. Plan No. 1 shows their general locations.



Site No.1 is near the S.W. point. It is a circular pile of broken coral 20 feet in diameter and 3 feet high. This mound starts in an area of broken gravel, clear of brush, just back from the beach, and separated from the beach by a fringe of brush. It has been tentatively identified as Structure "T". See photograph No.1.

Site No.2 is about 125 feet east of Site 1, in the same clear area. It is a platform 12 1/2 feet by 5 feet, ~~2m~~ by 2 feet in height. It is constructed of coral slabs set on end, and the space inside filled with broken coral. In one corner a large slab stands 3 feet above the ground. This structure has been tentatively identified as structure "U". See photo No.2.

Site 3 is about 200 yards east of site 2, and is situated at the edge of the beach, on the top of the slope. It is a ruined beacon, 8.3 feet square at the bottom. The first level is 4.3 feet above the ground. The second level is set back about one foot all around, and the top is 8 feet above the ground. The beacon was built about 1916 for Captain Allen, and is very similar to the beacon on the west point of Hull Island. A survey signal, called "DOC" was erected here. See photo No.3.

Site 4 is just around the SE point from the beacon (site 3). There is a platform 11 1/2 feet by 6 feet by 2 feet high, in excellent condition. The walls are built of coral slabs laid like bricks, and the center filled with small broken coral. See photo No.4. This has been tentatively identified as structure "P". About 100 yards NE of the platform there is a cairn built of coral slabs about 2 feet high. It has been tentatively identified as Structure "O".

There are several cairns on the beach, and just back of the beach in this vicinity, but most of them were made of no more than four or five stones. There was no noticeable arrangement in their location. Between sites 1 and 3, three paved paths cross the coral gravel from the bush to the beach, and three clearly marked pathways likewise cross from the bush to the water. One of these paths continued on into the brush. Several swampy areas exist at this end of the island, which are believed to be guano pits.

Site 5 is the beacon and flag staff at the village (see photo no.5.). It is similar to but larger than the beacon on the S.E. point. It is 16.3 feet by 22.2 feet at the base and stands 9 feet high. The flag staff is 44 feet long. A main triangulation station was established 300 feet, bearing N.35° W. from the flagstaff, at the village end of the old tramway. About 1000 feet along the tramway and a little to the right there is a grave yard. (Site 6). There were four graves of recent date with low curbing and head stones with names and dates. One of these shows the date 1905. A little further on there are 13 more ancient graves, weather worn, about 3 feet by 6 feet, with low curbing and no head stones. The 1905 graves look very recent in comparison with these. Still further on there are five low circular mounds of coral gravel, four of them in one line and the fifth off the line a little. There is no indication as to their origin or purpose.

In the village there is the ruin of a large house, built by Lever Bros. about 1905, and wrecked in the hurricane of 1914. About 100 yards north of the flagstaff on the beach, there is a white post carrying a triangular white mark, supposed to show the anchorage off the village. About a quarter of a mile north of the flag-staff in the Government Area, the U.S.S. Bushnell erected two range marks to show the best landing place. The cistern is just inshore of these, and the Observation pier is just to the north.

Site 7 is in the ~~bush~~ brush north of the guano pits near the SE point. It is on the ridge just above some small pits, and is not far from the end of a small tramway. The structure is a cylindrical tower of coral slabs, with a square platform in front. This is easily identified as structure "R". See photo No.6. The cylinder is 3 feet in diameter, solid, and 5 feet high. The platform in front is built up of slabs laid like bricks, and is 4 feet square, and from 8 inches to a foot high. Kima guided me to this spot, as he had seen it before when he had



helped to clear all this area. He was much surprised at its dimensions, as he had remembered it as being much larger. He also stated that the last time he had seen it the platform was intact, and securely decked over. He also said that one of his companions at that time had been much interested in the structure, and that he believed that his friend had returned and rifled it. The broken down condition would bear out this suggestion.

Site 8 is a stone deck standing out into the lagoon at the end of a short tramway, which leads from the center of the island to the lagoon. See photo No. 7. It can be clearly seen that the level of the lagoon has dropped since the deck was built.

Site 9 is about a quarter of a mile north along the beach shore from the guano dock. It is readily identified as the structure "S". There are six cairns set about midway between the old shore of the lagoon and the present water's edge. Most of them are broken down, but one cairn was intact, and measured 2 1/2 feet by 5 feet by 2 1/2 feet high.

Site 10 is in the heavy brush along the NW shore of the island. Here the beach rises steeply to a coral gravel ridge, heavily overgrown with brush. This ridge is about 100 yards wide, and then the ground drops away to a rather wide valley, which is relatively open. The structures at this site were found about 50 yds in from the beach, and about 1/3 of the way from the village to the north point. Structure "E" was the first one discovered, but a little searching uncovered structures C, D, F, G, H, and I, hidden in the brush. Enough measurements were taken to identify these structures surely. The ovens mentioned in the notes furnished by Mr. Emory were not discovered. About as far south of E as H and I are north, I discovered a circular paved path about sixty feet in diameter.

Site 11 is about half a mile south of the northern point. Here I found a platform about 11.4 feet by 6.3 feet by 1.7 feet high. It is in excellent condition, and is formed by a row of slabs set on edge with the center filled with small broken coral. I have identified this as structure "L". I was unable to locate structures "M" and "N", and no opportunity afforded to explore the northern point.

Site 12 was located after considerable search through very heavy brush and consists of structures "A" and "B". I found that the plan from the notes supplied by Mr. Emory was correct in general, although there were several omissions. I found the site fully covered with brush, so that my men had quite a job on their hands clearing the lines of the court, and I was unable to get a complete view of the whole courtyard. I am unable, therefore, to state that the stones marked 14 and 17 on Mr. Emory's plan do not exist, I can only state that I could not find them. The stone marked 16 must be a miss-interpretation of the notes, as I found none more than 6" high in this area. However, there is an upright about the middle of that side. Figure 2 shows the plan of the structure according to my measurements, and Fig. 3 is an isometric view indicating the size and relation of the several standing stones. I have compared my plan with the photographs and data furnished by Mr. Emory, and find only one discrepancy - In Photo No. 1197 (Bishop Museum) a stone a stone about 1 foot square can be seen standing on the marae near the tallest upright. I found no such stone. Several small stones - say about a foot square - were noticed among the brush, which gave me the idea that either the court had been paved at one time, or that there had been a paved path across it.

There is one item that I have not seen brought out in the notes furnished by Mr. Emory, and that is the structure "B". I found it to have a curbed court similar to that of structure "A". I did not take the time to sketch structure "B" very carefully, nor did I take many measurements, for which I am now sorry, as I find several items in my notes which differ from the data furnished by Mr. Emory. [a] The court, extending 40 feet to seaward from the structure. [b] The depth of the structure, which I found to be 21 feet, but which the notes give as 14 feet. [c] The location of the upright, which I found is questioned in the notes, but which I recall as being placed in the same way as those of structure "A" - i.e. about six



inches out from the curb, and approximately in the middle of the length. The upright must be about 5 feet high, I did not measure it.

Site 13. is about half way between sites 10 and 11, in a relatively open area of coral gravel. I found a large hole surrounded by an irregular ring of slabs set on edge. One of the slabs is about 4 feet high. A little further on I found another similar hole. I did not pay too much attention to the site at the time, and did not make any measurements. On giving the matter due consideration, and studying the photographs in the data furnished by Mr. Emory, I have come to the conclusion that these two structures are sites "J" and "K", and that someone had attempted to dig them out. I found the path mentioned in the notes.

I did not have an opportunity to make any further investigations about the island. However, I talked at considerable length with Jack Pedro, who is a very intelligent person, and he made detailed inquiries of all the natives, and I can find only one structure which I did not visit - structure "N", which Pedro describes as being very similar to the platform at site 4. I could find no trace of structure "Q". Pedro tells me that when he was working here for Captain Allen, he camped down near the S.E. point - and assisted in clearing off all the brush between the guano pits and the lagoon, to plant coconuts, and he states that he is sure that if there were any structure similar to, or of a size comparable to, structure "A" existing in that area, he would have seen it. All of the men I talked with know of the existence of structure "A", but none had seen or heard of any such structure at site "Q". I questioned Pedro several times, and through him various natives, as to the existence of a platform in the brush of the S.E. point, and they all knew of one, oh, yes - but it always turned out to be structure "R".

On the first reconnaissance trip, upon arrival at the island, I followed the old tramway from the village around the head of the lagoon, and on until it dies out in the brush. I made several attempts at the time, and later, to cut across from the lagoon to the NE shore, between the end of the tramway and the guano dock, on two occasions managing to get within about 200 yards of the beach, before running into impenetrable brush, but I found no sign of the tramway. The tramway shown on figure 1 is taken from the aerial photograph, and shows all I could find of it. There does not seem to be any connection between the two pieces of tramway. The tramway cuts across the north end of the lagoon on two causeways, which carry it at least two feet above the present level of the lagoon.

The coconut trees on the island have been divided into lots of 25 trees, and the corners of these lots marked by coral slabs on edge, set in cement, or by cairns. Each man, woman, and child receives two lots, in different parts of the island. The colonists have made several boats, using the lumber that made the forms for the cistern. They are tied together with sennit.

Pedro has been on the island several times before, as an employee of both Captain Allen and the Burns-Philp Co. He told me one evening about discovering an old canoe in the lagoon on one of his former trips. He said that he brought it to the surface and looked it over, but that one side was either broken away or rotted, and he let it sink again. He said that the construction was not like the Gilbert Island canoes, and not exactly like the Tokelau variety. He said that he had tried to find it again this trip, but that the water is much darker and much more salty now than it used to be, and he hadn't been able to locate it. In one of our conversations he happened to mention that just before our arrival three people had arrived from the Gilberts in a small canoe. The only remarkable item seemed to be that it was two men and one woman. The trip did not seem to be anything out of the ordinary.

We had a most enjoyable stay on the island and found the people very friendly, clean, and willing workers. The people put on three dances for us during the week we spent on the island. I took a great number of photographs, which are mostly worthless, due to a faulty shutter.



I have [have] been able to obtain little or no information on the history of Sydney Island. According to Bryan this island was not extensively worked by the Phoenix Guano Co., but from evidence on the island, somebody did a great deal of work there. According to the sailing directions, it was discovered and named by Captain Emmet. The spelling of the name seems to indicate British origin. It was with the rest of the Phoenix group, claimed by the British in 1889, the flag being hoisted and a protectorate declared on June 26, 1889. According to Jack Pedro, Lever Brothers established a plantation here in 1905, and planted the first coconuts. The island seems to have been worked spasmodically since 1916 by Captain Allen and Burns-Philp as a copra plantation. The island was visited in January, 1937, by H.M.S. Leith, Captain L.C.P. Tudway, R.N., and in October, 1937 by the H.M.C.S. NIMANOVA, M.L. Singleton, Master, and H.E. Maude, Administrative Officer. The present colony was established in the fall of 1938.

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ADDITIONAL NOTES

Inhabitants of the present colony mainly from Gilbert Islands, although a few are from the Ellice group. There is a native chief, or magistrate, who does not speak English, and a radio operator who does. At the time of our visit (Sept. 1939) we were informed that the Commissioner for the Gilbert and Ellice Islands Colony would be in residence here for about six months, beginning in October, 1939.

Island badly in ~~need~~ need of rain, as the wells, of which there are some 15, are all contaminated with salt from the lagoon. Coconut grove on S.W. point, around the village, and at the S.E. point, with scattered palms along the southern shore. Coconut palms 55 to 60 feet tall, about 70 feet above sea level. Rest of island covered with a heavy growth of brush, standing 12 to 15 feet above the ground.

Sign erected on tree: "This Island belongs to His Britannic Majesty King George VI, was visited by HMS Leith Jan, 1937 (sgd) L.C.P. Tudway, Captain RN."

One short section of tramway runs from a stone pier on the east side of the lagoon about 1/4 mile into the brush. There are three or four swampy areas near the SE point which appear to have been guano workings.

Large coral slab beacon on SE point built by Captain Allen about 1915. Now badly broken down.

Pedro has been on the island off and on since 1923. He states that when he was on the island about 10 years ago [1929] the lagoon was higher, and much less salty, and that the wells at that time gave good sweet water. He also states that the only poisonous fish he knows of on the island are the reef fish. All the deep water fish are edible and eaten regularly by the colonists.



## SYDNEY ISLAND

(From notes of H.W. Bigelow, 1939)

13 September, 1939. - Wednesday - en route Sydney Island to Birnie Island. What a lot has been going on. We carried off the landing about 6 A.M. Just a week ago today - and George, Rebel and Ed went ashore in the first boat - while I stayed aboard to check out all the gear. Rebel handled the landing end - and George and Ed went for a look-see around the island. I finally shoved off about 1:30 - in the last boat - and was all set ashore and watched the ship steaming off by 2 P.M. We had grand quarters - they had been built for the Commissioner who is making an official visit next month - and we just hit it lucky. The HQ house consists of a living room and two bed rooms opening off, one on each side. The walls made of the ribs of coco palms, and the ~~roof~~ roof thatched with palm fronds - it was very cool and quite comfortable. We had cement floors, with a big floor mat over it, and a porch all around made of clean white gravel. On the beach side of the house are two small houses - one we use for a kitchen & I guess that is its intended use - the other will eventually be a head and shower - but they are not yet installed, so we use the house for a storehouse. The men had a big airy shed with a cement floor, and rough board walls. We were very comfortably located.

That afternoon Ed and I went on a tour of investigation. There is a tramway, presumably built by the guano workers back in 1870 or thereabouts. It is just a level, more or less surfaced pathway, six feet wide, dug out here, or filled in there, and crossing the north end of the lagoon on a well built stone causeway. We followed the tramway about a mile and a half until it lost itself in a mass of brush, and we spent a futile half hour trying to get somewhere, and finally gave it up and came home. While I think of it, the island is a crude triangle, pointed about north. The base is about 2 miles, and the two legs are about 1 1/2 miles each. The settlement is on the left hand or SW corner, where there is a grand grove of coco palms. Most of the rest of the island is covered with brush, except in the SE corner, where there are three swampy areas - where they dug out the guano, and where Lever Brothers planted coco palms about 35 years ago, so are growing OK, and some are not. In the center of the island is a lagoon, roughly circular, and about a mile in diameter. It is very salt, just like brine solution, and deep mahogany brown in color, and the mud stinks something terrific. Where the bottom is covered with water it is oozy mud, but where the bottom is exposed to the sun the mud has hardened like cement. The lagoon is about two feet lower than it was when the guano workers built their causeway.

After supper Pedro - the boss-man - came over with the High Chief and the Talking Chief. Pedro is half Portuguese and half Tokelau, and is a very good man for his job - which is construction of public works in the Gilbert and Ellice Islands Colony. At the moment he is acting administrative officer on Sydney. He was here in 1923, and has been here off and on for different people since then. He really knows the island, and a lot of my dope is from him, so "Pedro says" will run like a refrain through this narrative. We had a very nice little chat with the Big Shots, Pedro acting as interpreter, and arranged to hire native labor day by day as we needed it, at the rate of 50 cents a day, to be paid in goods on the ship when she got back; an arrangement satisfactory to both parties. After the conference we adjourned to the Guest Fale for a dance. It would require a sound movie to really convey an adequate idea of that dance. The music was furnished by a police whistle and a gasoline drum. One lad pounded on the head, and four or five more gathered around and beat on the sides. They did very well, and it was a little while before I realized that it was a gas drum they were using. They would start a slow beat on the drum, and then one voice would suddenly chant a few words, and then half a dozen would chime in, singing in time to the drum beat, and punctuated by the whistle. Then two or three men would get up - dressed in a lavalava and an ula, pick up a grass skirt and wrap it around them, and start to go through the routine. This was obviously a set series of gestures to go with the words, and they kept excellent time. Some of the emn were wonderfully graceful. It seemed to



be a sort of unwritten law that when anyone got up to dance, they put on part of the traditional costume. Sometimes it would be three or four of the girls who would get up and dance, and sometimes it would be couples, but that was only for one or two dances; for most of them it was either a male or female team. The hand gestures seemed to be about the same for both teams, but while the men did a sort of bent-knee shuffle, the girls, quite often, did some very neat hip wiggles. The boys who danced were anywhere from teen-age to grandfathers, but mostly lads about twenty - the young bucks - same with the girls, though very few of the older women danced at all. The interesting thing was the fun they were having. It was like a country barn dance, crude orchestra, and maybe not all of the dancers experts, but all of them competent, and all having a grand time. Those who weren't dancing sat along the side lines and sang and clapped. We sat at one end - Rebel, Jimmie, Ed and I were dignified by chairs, but the rest of the boys sat on the floor mats like everybody else. They finally wound up about 11:30, and we were ready for bed.

Next morning we were up and had breakfast about 6:30, and Jimmie took his working party and four natives and went off to build himself two tower foundations, while Ed and I took two sailors, Pedro and 8 islanders, and a load of signal gear, and headed out along the south side of the island, building signals, spotting them on our aerial photos, and in that way doing our shoreline at the same time. We arrived down by the SE corner about noon, and checked on the tower site, and found three old ruins which I carefully measured and photographed. Then we headed back along the lagoon shore for the village. On the way back Pedro showed us a well that he had dug some years before, when it gave cold, sweet water, but now it was almost undrinkable, it was so salty. The trouble with the island is lack of rain. We came back to camp again about 1 P M, and rested, and set out again along the NW shore, and built two more signals - and those two signals took more effort than the four we built in the AM, you just can't work in the afternoon.

That evening we were glad enough to take things easy, and turned in early. Friday morning Ed took the gang out and built two signals on the west side of the island. I had cut my foot on a bit of coral, and decided against the five mile hike. I got Pedro started on shifting the steel for the third tower. He had a gang of men, and a go-cart we had rigged out of a Ford front axil, and first he moved one of our boats into the lagoon, and then started to carry the cement and steel, and other tower gear. There was about 800 pounds of cement, and at least a ton of steel, to say nothing of the forms, etc. It took him and his gang the whole day to cart the stuff down to the lagoon and transport it across, and clear out the trail so that the long tower legs could be carried along it. Ed got back in the early PM - just a little late for lunch - and we went down and had the lumber out for the base line, referenced the tower Jimmie had been working on - he finished it about 2:30 p.m. - and did a couple of other odd jobs.

Saturday Jimmie started on the other tower near the village, while Ed and I with out gang went to work and staked out the base line along the line of the old tramway between the two towers. It was half a mile long, and it took us all morning to stake it out. In the P.M. we were able to level and measure the whole thing. That was a full day's work - no fooling. In the evening there was another dance. This time the regular weekly affair. We had a good time as usual. It is almost impossible to give a real description. The nearest I can come to is to say that it was a cross between Tom Hiona and a barn dance. That is, the technique was that of Tom Hiona and the atmosphere that of a barn dance - or maybe it was vice-versa.

Sunday was just one of those days. We decided to give the boys a break - and let them sleep in an hour - and as a result we didn't get started until about 8 A.M. Then Jimmie was across the lagoon building the far tower, and Ed and our gang were supposed to be building signals in the lagoon. It didn't work very well, and we had a terrible time. Instead of being able to clear the whole work up in the morning, it took us all day. That evening we observed our stellar azimuth, and of course that would be the one bad night of our stay. We only had one hour of clear



sky, and were finally chased home by a down-pour, that lasted until we reached the house. What a life.

Monday we had to wait for Jimmy to finish the third tower, so I took the opportunity to go exploring. Ed occupied the two home towers, which he did easily in half a day. In the AM I searched through the brush, and uncovered about half of the ruins I was looking for, but not the big one that Emory was most interested in. I finally had to give up, and come back for lunch, but in the PM I went out again, and this time by systematically working through the brush, I finally stumbled on the big shrine. It was a big one too. I measured it carefully and took a few photos - couldn't get much an account of the heavy brush. That night there was a farewell dance for us - and they hung ulas around our necks, and made a present to us of the only thing they had - Palm toddy. It is good - I learned to like it - and I have some with me. We gave them four boxes of satinas, and they went wild with joy. It is really fun to give people things when they obviously enjoy them so much.

Tuesday we went out cutting in, and had quite a time for ourselves. But we managed to finish up by dark. That night we had another dance - but didn't stay too long - as we were all tired out - and had to be ready to go off at 6:30 A.M.



## SOME NOTES ON SYDNEY ISLAND

We landed on Sydney Island the 6th of September, 1939, and established camp at the newly erected Guest House, built for the visit of the High Commissioner. In the afternoon we explored the old tramway, running from the center of the village (on the South west point) around the north end of the lagoon for about one and one half miles, until we lost it in the heavy brush. We made two attempts to cross from the lagoon to the ocean on the west side, but could not find any trace of the tramway, nor could we get through the last few hundred yards of brush.

On the 7th of September (Thursday) we walked along the south shore building signals and establishing shoreline control. Near the South-East point, as shown on Fig. 1., we located Site 1. This is a circular pile of coral stuff twenty feet in diameter, and three feet high. (Photo No. 1.) This mound is standing in an area of coral gravel, clear of brush and trees. It has been tentatively identified as Structure "T" of the Zaca party.

About 125 feet east of Site 1., in the same clear area, there is a platform (Site 2.) 12-1/2 feet by 5 feet, by 2 feet high. It is constructed of coral slabs set on end, and the space inside filled with coral gravel. In one corner a larger slab stands three feet above the ground. (Photo No. 2.) This structure has been tentatively identified as the Zaca Structure "U".

About 200 yards east of Site 2., there is a ruined beacon, (Site 3.) mentioned in the notes of the Zaca visit. The structure is 8.3 feet square at the bottom, and the first level is 4.6 feet above the ground. The second level is set back about one foot all around, and the top is 8 feet above the ground. This beacon was built about 1916 by Captain Allen, and is similar in construction to the beacon on West Point, Hull Island, which was also built by Captain Allen at the same time. A survey signal was erected here. (Photo 3.)

Just around the South East point from the beacon, and 73 feet SW of Triangulation Station "ILE" there is a platform (Site 4.) 11-1/2 feet by 6 feet by 2 feet high, in excellent condition. The walls are built of coral slabs laid like bricks, and the center is filled with coral gravel. (Photo No. 4.) This has been tentatively identified as the Zaca Structure "P". About 100 yards North-east of this site there is a cairn made of coral slabs, about 2 feet high. This has been tentatively identified as the Zaca structure "O". There are several cairns on the beach in this vicinity, but most of them are constructed of only three, four or five stone. There was no arrangement noticeable in their locations.

Between Sites 1 and 3, three paved paths cross the coral gravel from the brush to the sea, and three clearly marked pathways, likewise running from the brush to the water. Only one of these paths continued on in the brush. Several swampy areas exist at this end of the island, which are believed to be guano pits. No more exploration was done this day, but the party returned to camp along the shore of the lagoon. Our guide showed us several old wells, each about a foot in diameter and fifteen to twenty inches deep, and covered with a large stone. The water in them is now brackish. The same day we made a trip along the western shore of the island, building two signals, but having neither the time nor the energy to explore the brush.

On Friday, the 8th, a party went around the beach to the North East shore, and built two more signals, but no effort was made to explore inland. In the



afternoon we investigated the village in more detail. A beacon, carrying a 44-foot flag pole, (Site 5.) (Photo Number 5.) which is similar to, but larger than the beacon on the South-east point, was examined and photographed. Triangulation Station "NEE" is located at the end of the old tramway, three hundred feet, bearing N35°W from the flagpole. One thousand feet along the tramway from the station, and a little way to the right (south) there is a grave yard. (Site 6) Three types of graves were noticed. There are four graves of recent date with low curbing, and headstones with names and dates. One of these shows the date 1905, the time of the occupation of the island by Lever Brothers. A little further on there are 13 more ancient graves, weather worn, about 3 feet by six feet, with low curbing and no headstone. The grave with the date 1905 looked very recent in comparison with these older graves. Still further on there are five low circular mounds of coral gravel, four of them in one line, and the fifth slightly off the line. There was no indication as to their origin or purpose.

In the village there is the ruin of a large building built by Lever Bros. and destroyed in the hurricane of 1914, it is believed. The village is good sized - there are some 130 people - and it is very clean and well built. The people are colonists from the Gilbert and Ellice Islands. There is a radio station and a cistern with a capacity for 31,000 gallons of water has recently been built. They have dug several large wells which supply the needs of the village. The colony is very poor, as the coconut palms are not thriving, due to lack of water. All the palms on the island have been divided in lots of 25, and assigned to the various people, each person receiving 50 trees. The corners of these lots have been marked off with cairns, two coral slabs set on edge in concrete, marking the lines, with the number of the lot on each face. The colonists have built several boats, built of planking tied together with sennit, after the manner of the old fashioned war canoes. They have built a most comfortable and comodious guest house, with a cement floor, standing on the typical polynesian house-platform. The Administrative Officer is Jack Pedro, who is half Portuguese and half Tokalau. He is the brother of Mrs. Jennings on Swains Island. He is also the Construction Foreman for the Gilbert and Ellice Island Colony, and has built most of the public works for them in these islands. He was employed by Captain Allen and by Burns-Phillips at various times, and has visited all these islands several times at different periods. He acted as our guide about the island, and from him we obtained a great deal of miscellaneous information. Among other things, he told us of finding a canoe sunk in the lagoon. He said that he had found it when swimming there some years ago, but that he had been unable to locate it this time, as the water was much darker, and much more salty. He said that the canoe was not like the Gilbert or Ellice types, and that one side was either rotted away or had been broken when the canoe sank.

On Saturday, the 9th, we were too busy staking out, measuring, and leveling a precise base line a half mile long to be able to do any exploring. Sunday morning with Pedro as a guide I went across the lagoon with a party, and struck off into the brush in the vicinity of the swampy areas of the South East point. Pedro showed me where he had camped in 1923, and told me that at that time they had cleared off the brush between the swamps and the lagoon, in order to plant coconuts. He took me directly to Site 7. This is a cylindrical tower of coral slabs, with a square platform in front. This is readily identified as the Zaca structure "R". The stone cylinder is three feet in diameter, solid, and five feet high. The platform in front is built up of slabs laid like bricks, and decked over. It is four feet square and some 8 inches to a foot high. Pedro was much surprised at these dimensions, as he had remembered it as being some eight feet high. He also said that when he saw it last the platform had been in good



condition, and fully decked over. He said that one of his companions of that time had been much interested in it, and he believed that he had returned and rifled it. The broken down condition would bear out that view. (Photo No. 6.)

After leaving this site we cut through the brush, and came out on a short section of tramway which leads down to the lagoon, and ends in a stone pier, Site 8. (Photo No. 7.) About a quarter of a mile up the beach I located the Zaca structure "S", Site 9. There are six piles of rock set about midway between the old shore and the present water line of the lagoon. Most of them are broken down, but one pier was intact, and measured 2-1/2 feet by 5 feet by 2 1/2 feet high. I believe that the "Weirs" mentioned in the British report of the island may be the causways where the old tram way crosses the north end of the lagoon.

Monday morning, the 11th, was the first real opportunity that I had to explore the area of brush along the west shore, north of the camp. The area is heavily wooded, with brush running up to ten and twelve feet in height, and very thick. Most of it is dry and very difficult to cut, or get through. There are open spaces of coral gravel, where the going is good, but these open lanes are mostly in the valley behind the ridge on which the structures stand. After casting about fruitlessly for some time I saw a large platform through the brush (Site 10) which I identified as as Zaca structure "E". I also readily located the adjacent structures, C, D, m F and G. I made a few measurements and took some photographs to check the identity of the monuments. I then cast southward through the brush for quite a way, finding here and there indications of a paved path, completely hidden in the brush. At one place, about 100 yards south of Structure "E" I noticed a circular paved path, about 60 feet in diameter. South of this path there was no indication of any structures, and the brush was very heavy, so I turned around and headed north. About 100 yards north of structure "G" I found the two structures "H" and "I". They are formed by one row of slabs, set on edge, to form a curb, and the space filled with coral gravel. The ovens mentioned in the Zaca notes must have been well hidden in the brush, as I did not find them.

I find that distances in the brush are a very illusive matter. The short distance mentioned by the Zaca notes as lying between structures "B" and "C" is a myth - there is a great deal of thick brush - and at least ten minutes hot work. I find that I have great difficulty in estimating the relative spacing of the several structures I encountered in this brushy area, and can only say that I found - some little distance north of site 10 - a large hole, surrounded by an irregular ring of large slabs on end. One of these slabs were about four feet high. I did not examine the site at all carefully, nor did I make any measurements. A little further on I found another similar site, and began to think. Both these sites are in open areas of coral gravel, and correspond approximately to the locations given for structures "J" and "K". On comparison with the photographs, after my return to the ship, I am convinced that someone has attempted to dig up these two structures. I have indicated the approximate location of these structures as Site 13. I found several patches of the paved path mentioned in the Zaca notes.

About 500 yards north of Signal "NOT", and about half a mile south of the point I located Site 11. This site is a platform 11.4 feet by 6.3 feet by 1.7 feet high, in excellent condition. A row of slabs on edge form a curb and the center space is filled with coral gravel. I have identified this as structure "L" of the Zaca notes. The structure is in an area of open coral gravel. I attempted to go on, and locate structures "M" and "N", but the brush was getting thicker, and it was almost noon, so I headed back to camp.



In the afternoon I headed out with two natives, and made directly for structure "E". From here I proceeded to work systematically through the brush from the sand to the back side of the ridge. I finally stumbled upon Site 12, which I knew at once to be structures "A" and "B" of the Zaca notes. I found that the plan made from the Zaca notes is correct in general, although there have been several careless omissions. I found the site fully covered with brush, so that my men had quite a job on their hands clearing the lines of the court, and I was unable to get a complete view of the whole courtyard. I am, therefore unable to definitely state that the stones marked 14 and 17 on Mr. Emory's plan do not exist, I can only state that I could not find them. The stone marked 16 on the plan must be a miss-interpretation of the notes, as no more than six inches high was found in that area, however, there is an upright about the middle of the side. Fig. 2, shows a plan of the structure, according to my measurements, and Fig. 3, is an isometric view indicating the size and relation of the several standing stones. I have compared my plan with the photographs taken by the Zaca party, and find only one discrepancy. In Photograph No. 1197 (Bishop Museum) a stone about 1 foot square can be seen standing on the marae near the tallest upright. No such stone was found. Several small stones - approximately one foot square - were noticed among the brush in the courtyard, which gave me the idea that either the court had been paved, or that there had been paved paths across it.

There is one item that I have not seen brought out in any of the Zaca notes or sketches, and that is that the Structure "B" has a curved court very similar to structure "A". I did not take the time to sketch structure "B" very carefully, nor did I take many measurements, for this I am now sorry, as I find several items in my notes that differ from the data given by the Zaca notes. [a] The court, extending forty feet seaward from the structure. [b] The depth of the structure, which I found to be 21 feet, but which the Zaca notes gives as 14 feet. [c] The location of the upright, which I find is questioned in the Zaca notes, and which I recall as having been placed in the same way as those of structure "A" - that is, about six inches out from the curb. I believe that the upright is about five feet high - and placed approximately in the middle of the side of the structure. I did not measure them.

I did not have any further opportunity to make a personal investigation of the island, but I have had several talks with Pedro, who has been all over the island, and who has inquired of all the natives. He knows all the sites that I have visited, and in addition describes the location and appearance of structure "H" exactly as does the Zaca Notes. He states that it is similar to site 4., in size and construction. I asked him several times concerning Structure "Q", and he states that there is no such structure. He has made a point of asking those of the islanders who have been around that part of the island most, and they agree that there is no structure similar to structure "A" in that part of the island.

It would appear that the Zaca party covered the ground very thoroughly during their short stay on the island. It is too bad that someone couldn't have been with us who could have devoted all his time to a study of the island. I was too busy with my own work to make more than a hurried examination, being able to devote only parts of one day to that end. I do not believe that any more information can be uncovered here unless a large and well equipped party can spend several days here. They will need plenty of sharp brush knives. I took a good many photographs, most of which are of no value, due to some trouble with my shutter.



## NOTES ON HULL ISLAND

By H. W. Bigelow, 1939.

Hull island is a coral atoll, rectangular in shape, about 5 miles long by about 2 miles wide. The long axis is roughly ENE-WSW. An island rim about 1/4 mile wide surrounds a fairly clear lagoon. The island is surrounded by a fringing reef which is roughly 100 yards wide and which bares at low ~~tide~~ water. At the edge of the reef, the bottom drops away rapidly, except near the eastern point, where 60 fathoms was found 800 yards off shore. Elsewhere the 100 fathom curve lies within 600 yards of the reef. The 500 fathom ~~curve~~ curve lies about 1 1/2 miles off shore.

On the south-east shore there are two passes through the island rim, which are fairly deep at high water, but which do not connect with channels through the reef. On the northwest side the rim is broken by some twenty channels of varying width and depth. Two of these connect with channels through the reef and are practical for small boats. The easternmost channel was blasted by the U.S.S. BUSHNELL party in July, 1939, to carry a depth of 4 1/2 feet from deep water to deep water, at Spring high water. This is the widest and deepest channel. The other channel, near the western end of the island is marked by two rock cairns, but is narrow and shallow.

An observation spot was established by the Bushnell party, and occupied with the Astrolabe. It is on the tip of the island just east of the blasted channel. The coordinates are: Latitude 4° 29' 15" S., Longitude, 172° 10' 15" W. Another spot was occupied by the New Zealand Naval Survey party in January, 1939. It is located on the lagoon shore directly in front of the Administrative Officer's house. The coordinates are: Latitude, 4° 31' 00" S., Longitude, 172° 13' 35" W.

Landings may be effected at the blasted channel entrance described above, or off the western point near the village. This landing is dangerous as the surf is tricky, but a smartly handled pulling boat should have no difficulty in ordinary weather.

The island is well wooded. At the western end there is a large and flourishing grove of coconut palms. There are small stands of *Pisonia grande* and other trees scattered about the island, but most of the growth is scrubby, and a great deal of it appears to be dead. It is possible that a bad storm in recent years has flooded the island and rendered the ground water too salty for the trees to live. The photographs 1 to 6 show the appearance of the island on the northern side, east of the blasted channel. The ridge of coral shale in picture No. 3 is typical of the whole island. On the southern shore there are more trees. The bush shown is about 15 feet in height. Picture No. 7 shows a charge of TNT being exploded in the channel.

The island has an abundant bird life, including boobys, terns, frigate and tropic birds. Hermit crabs are plentiful and there are some Polynesian rats. There are a few pigs and chickens at the settlement. Fish are plentiful in the lagoon and off the reef.

There is a settlement of some 80 colonists from the Gilbert Islands on the western point. They are administered by an Administrative officer (Mr. Jones) and a native magistrate. The island is under the jurisdiction of the Gilbert and Ellice Islands Colony. There is a radio station with the call letters ZIU. A supply ship from the Gilbert Islands calls here at irregular intervals. It is understood that a large cistern with a capacity of some 50,000 gallons is to be built in the near future. At present the only water supply is from two brackish wells, and the rain water caught on the tin roof of the Administrative Officer's house.

Several sites of interest were found. On the eastern point there is a large platform, 17.8 ft. by 8.5 ft., 2.7 feet high, built of coral slabs and filled with small pieces of coral. At the ends the structure rises to a height of 3.7 feet. The first course of slabs are set on edge, and the remaining slabs laid like bricks. A triangulation station was built over this platform. Picture No. 8 is a general



view, looking N.W. Photo No.9 is looking SE, and shows the details of the NW end. Photo 10 is looking N. as is No.11, showing the details of the SW face. No.12 and No.13 are looking west, and show the details of the NE face. No.14 is looking SW, and shows the general appearance from that side. The structure is quite similar to several platforms seen later on Sydney Island, except that this structure seems to have been built up at both ends of small coral slabs, rather than having one large slab extend above the rest. No the north of this structure there are three semicircular walls of coral slabs, which serve as excellent wind breaks, giving a clue to their possible origin. They are built on the crest of the ridge, and make use of the slope of the ground to give protection from the wind and rain - as we found out when a sudden shower overtook us here. West of the main structure, on a small point sticking out into the lagoon there are three cairns, two in excellent conditions and one just a heap of stones. Photo No.14 shows these cairns and the wind breaks. About 100 yards south of the platform there is an indeterminate structure, some two feet by three feet, and about four feet high - it is built against the steep slope of the ridge, forming a small terrace.

On the north side of the island, at the turn of the shore, there is a peculiar structure. It is built of coral slabs in the form of the symbol "[". It is built on the crest of the ridge, facing the ocean. It is a wall of coral slabs about two feet high, and five feet long. The two arms of the barcket are about two feet long. It does not appear to be a wind break, as it faces across the wind and does not take advantage of the slope of the ground as do the wind breaks near the eastern point. A survey signal called "NUT" was built over this structure.

About 400 yards east of the blasted channel, on the lagoon side of the northern rim, and about 150 feet in from the lagoon shore, there was found a structure shown in photographs No.16 and 17. The structure is built of coral slabs set on edge, and is in the form of three sides of a square, and about 4 1/2 feet on a side. The open end faces almost due west. The coral slabs are about one foot square and extend some five inches above ground. The site was carefully dug over by Dr. Schultz and Mr. Bigelow. It was found that there was a layer of fine broken shell and gravel about 1/2 inch thick, and then a layer of eather mixed with coral gravel, which looked as though it would be fertile. This layer is from 12 to 15 inches thick. Below this layer we encountered damp beach sand, shell and coral. There was no evidence of any disturbance within the square, except where the slabs had been set in a trench filled with small pieces of coral. The coral slabs must have been brought at least a quarter of a mile.

We did not happen upon the grave found by Mr. Bryan, near the western point. There are two cairns marking the entrance to the smaller western channel. One of these is square, and the other circular. Both are about seven feet high and some four feet across. These dimensions are estimates, as I did not have a chance to examine these structures. About a quarter of a mile north of the village, at the turn of the coast on the western point, there is a large coral slab beacon, 17 feet high and 10 feet square at the base. It was erected by Selfridge, foreman for Captain Allen, about 1916 or 1917. There are a number of signs indicating visits by various British ships, and areas set aside for ~~xxx~~ a Sea Aerodrome. There is a small grave yard in the village with graves dating to 1929 and 1930. It is believed that some of the graves are older. The 17 foot beacons mentioned above is locally known as the "American Beacon".

The New Zealand Navy made a survey of the island, particularly of the lagoon, in the latter part of 1938. They have carefully buoyed most of the coral heads with fifty gallon gasoline drums. They have erected signs at various points to establish claims over the areas needed for landing fields, buildings, etc.

The details of the discovery of Hull Island are not known. When Commander Wilkes, of the U.S. Exploring Expedition "discovered" the island August 26, 1840, he found there a sick Frenchman and 11 Tahitians who were catching turtles. Hull seems to have been claimed by the United States under the Guano Act of 1856 [??].





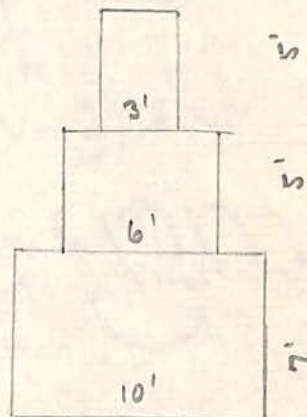


4. Sign near center of settlement, near flag pole.

This island belongs  
to his  
BRITTANIC MAJESTY  
KING EDWARD VIII  
Was visited by  
HMS Leith Aug.  
1936. sgd. O.Bevir Captain RN

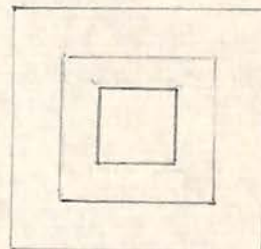
5. Sign on flag pole at settlement.

Gilbert and Ellice Islands  
Colony  
Administrative visit to  
Hull Island  
HMCS "NIMANOA" October 1937  
M.L.Singleton H.E.Maude  
Master HMCS "Nimanoa" Administrative  
Officer G.E.I.C.



6. Sign on tree beside American Beacon:

This island belongs to  
HIS BRITTANIC MAJESTY  
KING GEORGE VI; was  
visited by HMS LEITH  
January, 1937 (sgd) L.C.F. Tudway  
Captain RN



7. Coral block monument about 1/2 mile  
north of the flag pole in settlement - on west point.  
Spoken of as the American Beacon.

The settlement is centered around the flag-pole on the seaward side of the island at West Point. There are some 80 persons living on the island, most of whom are colonists from the Gilbert Islands, who have been there for less than a year. There are 17 adult males on the island. It is reported that there will be an olet [outlet?] group of some 200 colonists arriving in four or five months (November or December, 1939). Mr. Jones, the British Administrative Officer is in charge of the island, under the authority of the New Zealand Government. There are several shallow wells in the settlement area, which collect brackish water suitable for washing and possibly cooking. Drinking water is obtained from rainwater caught on the roof of the Administrative Officer's house. The natives rely largely on coconuts. It appears that the island was well covered with vegetation at one time - the present growth is largely dead stuff with a few struggling remnants. There are several stands of "Pisonia Grandis" scattered about the islands. It would appear that the sead brush now found all over the island was killed by salt water - it is assumed that a hurricane drove salt water over the island, and killing the trees which require fresh or brackish seepage water for existance.



NOTES FOR SAILING DIRECTIONS: HULL ISLAND.

Hull island is roughly rectangular in shape, about five miles long by about two miles wide. The long axis is roughly NE-SW. The island is surrounded by a fringing reef about 100 yards wide. The reef is more or less flat and dries in patches at low tide. There are several channels of varying width crossing this reef. This island itself is about 1/4 mile wide on an average, and encloses a large, and relatively clear lagoon.

On the NW side the land is broken by some twenty channels, two of which are navigable for small boats. The last passage to the east was blasted out by the Bushnell party in July, 1939, and carries about 4 1/2 feet from deep water to deep water, at the Spring tides. This is the widest passage of the lot, and was marked by a flag on a rock on the outer reef, and a cairn on the beach inside. The other negociable channel is near the west end of the chain, and is marked by two rock cairns, one on each side of the channel.

An observation spot, occupied by the Bushnell party, was established on the islet just east of the blasted channel. The coordinates are: Lat. 4° 29' 15" S., Long. 172° 10' 15" W.

On the south side of the island there are two passes from lagoon to reef, which are fairly deep at High Water, but there is no communicating channel through the reef.

There is a settlement on the Western point of the island, with a population of 80 people in July, 1939. The people are colonists from the Gilbert Islands, and are administered by a native magistrate and a British Administrative Officer. The island belongs to the Gilbert and Ellice Islands Colony.

The western end of the island is planted with coconuts, which seem to be doing very well. Several varieties of food plants have been tried here, but so far without success. The remainder of the island is covered with a fairly heavy growth of brush, most of which stands about 10 to 12 feet high. A great deal of the brush appears to have been killed by salt water within the past few years. There are several stands of *Pisonia grande* in various parts of the island, none of them more than about 40 feet in height. The palms in the vicinity of the village are up to 80 feet high, but rapidly dwindle in height north and south.

There is very little good water on the island. There are several wells, but they yield brackish water. The house of the Administrative Officer has a tin roof, with gutters, and he catches and stores rainwater. The materials for a large cistern of some 3,000 gallons capacity are on the island, but the cistern had not been built in September, 1939.

There is radio station operated by the Administrative Officer. There is a large beacon just north of the west point, which was built by Captain Allen about 1915. It is 10 feet square at the bottom, and 17 feet high, built of coral slabs. The first section is 10 feet square and 7 feet high, the second is six feet square and 5 feet high, and there is 3 feet square and 5 feet high. There is a flag pole at the village. The beacon marks a possible landing place.

The lagoon runs about 10 fathoms in depth, and is studded with 484 coral heads, mostly isolated. Only a relatively small number of these come within a fathom of the surface. The larger and shallower heads have been marked with buoys made from gasoline drums.

There are a number of signs about the island, marking out the limits of a proposed air port for the British Pacific Airways. These signs indicate that the island was visited by the HMS Leith in August, 1936, and January 1937, and by HMCS Nimanea in October, 1937.

One sign, on the west bank of the blasted channel, is of particular interest, as it indicates that all that portion of the island lying northwest of a line running 136° true through the sign is constituted an aerodrome reserve.



SOME NOTES ON MCKEAN ISLAND

(H. W. Bigelow, Jr.)

McKean Island is roughly circular in shape, and about 1/2 mile in diameter. It is surrounded by a fringing reef some 30 yards wide, which dries at low water. In the center of the island there is a considerable depression, usually more or less filled with water. The highest point of land is on the northern rim of the island and has an elevation of 17 feet above the reef. The most conspicuous object on the island is the ruin of a large building, with a wall standing 7 feet high. This is about the middle of the western rim. There is a fairly good landing place near this wall. Landing is possible at any time, but it is best just after high water, as the surf is apt to be less at that time, and there is more water over the reef.

The beach around the island is largely composed of beach rock and coral shingle. It rises very steeply from the reef to the crest of the ridge, and then drops gradually to the central depression. In one place on the northern rim there is a deep narrow valley, lying parallel to the shore, just behind the crest of the beach. There is very little vegetation, what little there is consists of Portulaca, Sesuvium, and Lepturus. There are innumerable birds, mainly terns of several species and frigate birds. The boobys, so common elsewhere, are relatively scarce. There are several kinds of crabs, including hermits, and a good sized black and orange sand crab. There are a few lizards, and some small insects, but there are no mosquitoes or common flies.

There are a large number of structures on the island, obviously the work of the guano ~~riggers~~ operators. These structures are scattered along the western rim, but most of them are in the vicinity of the conspicuous walls mentioned above, which seem to have been the center of the guano camp. A large quantity of debris was found among the walls, including pieces of chain cable, wrought iron nails, a copper pump (barrel pump.), bottles, a large section of wire rope, several pains of glass, and in one structure a copper plate with the following inscription:

THIS ISLAND  
TAKEN POSSESSION OF  
IN THE NAME OF  
THE UNITED STATES  
OF AMERICA FOR THE  
PHENIX GUANO COMPANY  
BY T. LONG

The plate was almost entirely buried, and is partly eaten away, but still legible. The reconstruction of the missing portion of three words was simple. Two other signs, indicating visits by British ships were found. One, lying in the corner of one of the ruins was nearly illegible, but was read as follows:

THIS ISLAND BELONGS  
TO HIS BRITANIC  
MAJESTY KING EDWARD  
VIII  
WAS VISITED BY  
HMS LEITH AUG.  
1936. Captain O. Bevir.

Near the crest of the ridge, not far from the conspicuous wall mentioned above, there is a small circular cairn, some 3 feet high and about 9 feet in diameter, carrying a small flag pole. On the pole was the following sign:

GILBERT and ELLICE ISLANDS  
COLONY  
ADMINISTRATIVE VISIT TO  
MCKEAN ISLAND  
HMCS "NIMANOA" October 1937

M.L.Singleton                      H.E.Maude  
Master HMCS Nimanoe              Administrative Officer



A facsimile of the copper plate above was made on the U.S.S. BUSHNELL, of 1/16" copper. The plaques were secured by brass screws to a 3x3x5 feet, and set against one of the ruined walls, in board of the astronomical pier. Stones were piled about the bottom of the post to form a cairn. The sign as replaced reads:

THIS ISLAND  
TAKEN POSSESSION  
OF IN THE NAME OF  
THE UNITED STATES  
OF AMERICA FOR THE  
PHENIX GUANO COMPANY  
BY T. LONG

SURVEYED BY  
USS BUSHNELL  
DECEMBER 1939.

The fishing in the deep water outside the reef is the best in these islands. The fish are both numerous and large, running up to about 80 pounds in weight. Tuna, barracuda, whoo, rainbow runner, and snappers are prevalent.



## NOTES ON GARDNER ISLAND

By H. W. Bigelow, 1939.

Gardner Island is triangular in shape, about  $3 \frac{3}{4}$  miles long, by a little more than a mile wide, the axis lying NW-SE. The land rim is roughly  $\frac{1}{4}$  mile wide, except at the NW end where it is about  $\frac{1}{2}$  mile wide. The island is surrounded by a fringing reef which dries at low water, and is some 100 yards wide. The island is well wooded with many stands of *Pisonia grandis*, and large areas of *kanava* [*Cordia subcordata*], *Tournefortia*, and other relatively low, bushy trees. Many of the trees run up to 90 feet in height, especially near the NW end. There is a large and relatively clear lagoon, with two entrances through the island rim, which are passable for small boats at high water, but which have no connecting channel through the reef.

The most conspicuous object is the wreck of the steamer *Norwich City* (Sir W.R. Smith and Sons, Ltd.) which was stranded here in 1931. (Information as to name and date received from Burns, Philp Co. Manager, Tutuila). The vessel seems to be of about 3500 tons burden, and has been gutted by fire. She stands upright, with more than half her length on the reef. There is a large hole on the port side extending down to the keel. The foremast is in place and intact.

The island is inhabited by some eighty colonists from the Gilbert and Ellice Islands colony. The exact number of persons is not known, but there are a total of 18 men in the village, including two boys about 16 years old. It is assumed that a family of five for each adult male is a conservative estimate. The colonists are very poor, as there are less than 200 coconut trees on the island, although many have been planted in the year they have been here. The village is on the south side of the lagoon entrance, near the NW point. They have a small cistern, some 12 feet square and 5 feet high. This cistern is the same type as that on Sydney Island, and is about  $\frac{1}{2}$  the size, so that it is assumed to have  $\frac{1}{2}$  the capacity. The cistern leaks at present, and will not hold more than 6 inches of water. Nearly every hut has a rain catching device of some sort. There are two or three wells giving brackish water. The rainfall on this island is the most abundant of any we have visited. During the week we spent on the island (early November) there was at least one shower every 24 hours.

The island is infested with the small Polynesian rats, which are ruining the newly sprouted coconut trees. There are many land crabs and a few hermit crabs. Fish are abundant in the lagoon and off the reef. Birds are also numerous and include boobys, terns, frigate and tropic birds.

The island was surveyed by the New Zealand navy in 1938, and the coral heads and channels in the lagoon have been buoyed with 50-gal. gasoline drums. Numerous survey hubs were seen, and several signs were noticed. Directly opposite the wreck the following sign is posted:

BRITISH PACIFIC  
AIRWAYS  
GARDNER ISLAND  
SEA AERODROME RESERVE  
NOTICE

The use of that portion of  
the lagoon marked off as an  
alighting area for marine  
aircraft is forbidden without  
prior permission from the  
Administrative Officer  
BY ORDER



A few hundred yards further south along the beach there is a small flag staff set in a circular stone cairn about three feet high, and some four feet in diameter. On the flagstaff is the following sign:

GILBERT & ELLICE ISLANDS  
COLONY  
ADMINISTRATIVE VISIT  
TO  
GARDNER ISLAND  
HMCS "NIMANOA" - October 1937  
M.L.Singleton            H.E.Maude  
Master HMCS Nimanoa    Administrative  
                                 Officer, G&EIC

The first sign is white with black letters, while the second is black with white letters. On the lagoon side of the NW point, across from the village, at the edge of the brush there is a third sign:

BRITISH PACIFIC  
AIRWAYS  
ADMINISTRATION  
AREA  
SEA AREODROME

This sign is black with white letters. In the brush behind the sign and for several hundred yards on each side there are numerous small stakes indicating the location of the several buildings to be built. A fourth sign is in a cove at the NW corner of the lagoon, but was not approached near enough to be read. It is white with black letters.

There are two range beacons near the village, but these must not be used as a guide for landing, as they are installed to aid the small supply ship that calls here frequently to anchor. The best landing place is directly over the reef about 1/4 mile south of the range, where the surf is apt to be lower. The landing is one of the worst in the Phoenix group, and should be attempted only at or just after high water. The surf on the falling tide is apt to be less than that on a rising tide. A good landing may be effected in the lee of the wreck, but the reef on that vicinity is very slippery, and if any equipment is to be landed this site is not recommended. Landing at the wreck is feasible at any stage of the tide.



(Manuscript in Bernice P. Bishop Museum)

The Phoenix Islands comprise eight scattered atolls within the latitude 2 degrees 45' to 4 deg. 40' South of the Equator and Longitude 170 deg., 40' West, or about 500 miles northeast of the Ellice Islands and 300 miles north of the Tokelau Islands. The Phoenix group, with the isolated islands of Baker and Howland, is in western Polynesia and lays not far distant from the Gilbert Islands at the southeastern end of Micronesia. To the northeast are the Equatorial Islands of north central Polynesia. Due east is Malden Island. The position of the Phoenix in Polynesia places them with the Tokelau and Ellice in direct line of the southeast trade winds that blow across central Polynesia, making them possible stopping places of canoes sailing or drifting with these winds. The Phoenix are also very possible places of landing for eastward moving people from Micronesia. The significance of the geographical position of the Phoenix is a very important point in the solution of the origin of the stone structures found on three of the islands.

All the Phoenix Islands were found unpopulated, as several sea captains discovered one after another. John T. Arundel reported finding a fish pond, and "a large collection of graves or whatever they are" to the Geographical Society of the Pacific in San Francisco in 1885 (1). In 1889, a British survey (16) also reported "ancient stone sites and an ancient fish pond" on Sydney Island. Sometime after the Phoenix Guano Company conducted operations at the southeast end of the island and built a dock and tramway at the east end of the lagoon. In 1905 Lever Bros. established a copra plantation and the first coconuts were planted. An investigation of the previously reported archaeological sites was made in 1924 by the Whitney South Sea Expedition, which found ancient stone structures on Hull and Canton, as well as Sydney. Notes and photographs made by E. H. Bryan, Jr. revealed platforms with upright limestone slabs. No ruins have been discovered on the other atolls of the group.

In August 1933, Mr. Templeton Crocker sent his yacht "Zaca", after its return from the Solomon Island Expedition, to the Phoenix Islands to collect further details on these archaeological sites and to search for more.\*

The finding at Sydney Island of two stone platforms with uprights and courts, closely resembling marae of eastern Polynesia, in western Polynesia long characterized by the absence of eastern types of stone marae, has stimulated much speculation as to the origin of the stone remains. A few stone uprights as shrines and a sacred stone refuse pit have been found in the neighboring Tokelau Islands, stone uprights and platforms in the Ellice Islands and on Ocean Island of the

\*As the guest of Mr. Crocker and Ethnologist for the Bernice P. Bishop Museum, the writer made the second survey. Through Mr. Crocker's generosity the published plates of the sites were supplied from the photographs taken by Mr. Toshio Asaeda, photographer of the expedition.



Gilberts, and stone altars and uprights, often associated with stone circles in other parts of the Gilbert Islands. In Samoa, there are <sup>an</sup>archaic "stone house" (sic), known as Fale O Le Fe'e and adjacent shrine. In all western Polynesia, our present knowledge reveals that structures of the Phoenix complex alone closely parallel marae of the eastern Polynesian Islands. Nothing of their type is found in Tonga or Fiji. The conclusion which first comes to mind upon comparison of the Phoenix with the eastern marae is that the Phoenix stone structures were built by people from eastern Polynesia.

Emory has found on Necker and Nihoa, outlying islands to the west of the Hawaiian group, prehistoric marae practically identical with the marae in the eastern Tuamotu. These in turn are very probably the prototypes for the simple marae of the western Tuamotu and Tahiti, which in the latter island, became elaborated into the large stepped marae. The Sydney marae, Sites A. and B, agree in general with the simple Tahitian marae.

Micronesia to the northwest is also an area marked by stone construction of an intensity and complexity at least equal to that of eastern Polynesia. Eastern Micronesia, through which no line definitely demarcating culture area boundaries can be drawn, has a mixture of Polynesian blood as well as culture traits. Here in islands of Polynesian and also of Micronesian culture, are found stone platforms, slab uprights erected on and beside platforms, and isolated stone uprights. Affinities to the Phoenix remains, therefore lie in both directions. The origin and time of arrival of the Polynesian blood and culture traits in eastern Micronesia is as yet unknown. It may be they are from the migrants who traveled through the area but whose great majority went on to settle in Polynesia. More and more evidence is accumulating to show a movement of Polynesian people and diffusion of their cultures from Polynesia into Micronesia, a natural movement with strong easterly winds to carry Polynesian sailing vessels westward into this part of the Pacific. Much of the answer on the origin of the Polynesian marae remains with the solution of the origin of the Polynesians in Micronesia and the definite knowledge of the Polynesian migrations that passed through the Micronesia to reach their final homelands to the east.

The elaborateness of marae of eastern Polynesia pales into simple shrines and upright monuments as one moves westward. Is this the diminution of the eastern development, affected by the lack of religious intensity and priests or by the small number of travelers? Possibly the order is reversed, according to the opinion generally held by Polynesian archaeologists, from the trait of erecting simple stone monuments in cleared spaces and building raised terraces or platforms, the marae of eastern Polynesia and the great terraced burial mounds of western Polynesia developed locally.

Before speculating further into this interesting problem of the origin and development of Oceanic stone structures, of the diffusion and local development of this widespread custom, let us look carefully at the Phoenix structures and those comparable to them.



## Sydney Island

This southernmost atoll, possesses thick vegetation, a deep lagoon, and a brackish pond which might possibly have been used for drinking water. Puslane grows on the island but no coconuts were reported growing there until planted for commercial purposes in 1905. For any earlier population, the food supply must have come almost entirely from the sea and lagoon. A fish pond was seen at the west end of the lagoon by Arundel in the 1880's and fish cairns were located in 1933. Arundel noted that the lagoon "is very salty and nothing will live in it." Since then the water in the lagoon has gone down several feet, as evidenced by the present height of the old guano works dock. One may hazard a guess that the limited food supply was a major reason for the population of the island not remaining permanently.

More than twenty of the Phoenix stone structures are concentrated on Sydney (Fig. 2) Most of these were seen, measured and photographed by the Zaca party, but unfortunately in an accident on the reef at the end of the last day of exploration, the records and photographs of nine sites (L-U) were lost. However, in September 1939 during an extensive survey of Sydney Island, Henry W. Bigelow, Jr., investigated all the archaeological sites again, except sites M, N and Q. Through his thorough recording we now have data and location to substitute for most of the lost information, and a check on the preserved records. The following descriptions of the eleven sites A to K are taken from the data obtained in 1933, supplemented by material supplied by Bigelow.

Thirteen sites extend along the northwest shore, the first nine closely associated and lying in a line along the high crest of coral rubble 50 yards above the beach. Of the 9 platforms, six were made of unworked coral slabs set on end to form a small or large rectangular frames which were filled with coral rubble to a height of one or two feet. The other three platforms, 3-1/2 to 4 feet high, were built with walls made of slabs laid horizontally, with other slabs set on edge around the outside base of the walls. One platform, A, had several erect slab monuments along the front and back sides, two platforms, B and F, had single slab monuments, and the remaining six in the group of nine were without the upright slabs. Site A. The platform was the largest and most complex of the structures. Originally this site was long and narrow with low curbed court extending before it on the sea side (fig. 3). The platform was built of limestone slabs about 15 inches high, set on end or on edge, and filled with coral rubble. In length, the whole platform measured 84 feet, and in width, 8 feet.

The platform was divided by limestone slabs into four sections of unequal size. At the western end are two small sections; Section A, the westernmost 12 feet in length and Section B 8 feet in length (fig. 3, A and B). These sections appear to have been shrines adjoining the two main platforms of the marae. This assumption is supported by the existence of separate courts or approaches of the main terrace before the shrines.

The longer sections of the platform formed a single unit from the appearance of the single court extending before both of them. Section C had an upright standing just before either end. The eastern upright was originally 7 feet, 3 inches high, although a piece over 5 feet in length lay, when found, beside the standing stump. Similarly the western front upright appeared to have been about 5 feet high. Behind the eastern upright was a smaller one built into the curbing and standing 3 feet above the



ground level. Another short upright was built into the rear curbing of this platform. Standing on the western end of Section C and in the middle of the platform were four uprights 4 to 5 feet high, forming a 5 foot square. Section D had an upright slab 7 feet, 2 inches high and 2 feet, 1 inch wide standing before the center of the front curbing. Just west of the front upright was another small upright set at right angles to the curbing and on the platform. (pl. 2)

Standing 3 feet from the eastern end of the platform and like the other frontal uprights, about 6 inches away from the curbing, was a 4 foot upright. This upright was about 7 inches thick, twice that of any of the other uprights. One upright 4 feet high stood in the eastern side curbing of the court. This was the only monument isolated from the platform complex.

The court before the platform was 84 feet long and 40 feet wide. Several small slabs, first thought to be broken remains of uprights on the court, but suggested as paving stones of a court walk by Bigelow, were observed in the Scaevola brush that now covers the court. The curbing of the court varied from 3 to 8 inches in height. Only sections of it remained, but enough was left to indicate its general outline and the approaches to the sections of the platform. At the northeastern corner about 6 feet of curbing ran toward the sea, suggesting a possible extension to the court which has been ~~washed~~ washed out by high tides. The curbing between the approaches to the Shrines A and B was not exactly parallel to the side curbing, so that the approach to Shrine A was wider at its opening and that of Shrine B narrower than at the opposite ends. These courts were covered with white coral, somewhat finer and cleaner than that on the large section of the court or on the platforms.

Site B. A broad platform 28 feet 6 inches long and 21 feet wide stands parallel to and 4 feet from the east end of Site A. The seaward walls of the platforms of sites A and B were in line. However, platform B was built with walls of coral slabs laid horizontally to a height of 1 foot 3 inches. The walls retained a coral rubble fill. A broken upright monolith 1 foot 2 inches high and 2 feet 6 inches broad stood a half a foot in front of the middle of the seaward or northern wall. This platform like Site A had court extending to 40 feet seaward. Bigelow, who discovered this, notes that the western curbing of this court did not run exactly parallel to the eastern curbing of the court of Site A. The ends of the front curbing of Sites A and B were 6 feet apart.

Site C. Platform C with sites D, E, F and G formed a complex of platforms with all except D having their south walls built in line. Platform C was low and rectangular in form, 13 feet long and 11 feet wide with walls built of slabs set on end. Inside it was filled with coral gravel.

Site D. Six feet east of platform C was a small shrine (plate 3). It was formed in a small rectangle, 4 feet 9 inches long and 4 feet wide, of conglomerated coral slabs placed on edge and standing 8 inches high on the south side and 1 foot 9 inches high on the north side. This structure faced inland. On the back side stood an erect slab 3 feet 10 inches high outside the wall, and a smaller one 1 foot 8 inches high just inside it. Some rubble fill lay within the enclosure and more appeared to have been washed out, letting a few short slabs fall into the center.



Site E. The adjacent platform to the northeast, stood 7 feet 6 inches from Site D. It was constructed like Site B, although it had large slabs set on edge at the ends of the platform and small slabs set on edge along the base of both sides (plate 4). This platform measured 29 feet long, 13 feet wide and 2 feet 6 inches high. Platform E is typical of the appearance of the platform structures, B, C and F.

Circular paved path. Bigelow notes, "about as far south of "E" as "H" and "I" are north, I discovered a circular paved path about 60 feet in diameter."

Site F. Site F was a platform 17 feet 6 inches long, 12 feet wide and 1 foot high, and built 6 feet east of Site E. A single erect slab 2 feet 6 inches high and 1 foot 6 inches wide stood about a foot from the middle of the seaward or north wall. Otherwise it was identical with Site E in construction with retaining wall of slabs set on edge around the base.

Site G. One hundred feet northeast of F was a smaller platform built with a curbing of 2 foot slabs set on end. It was nine feet long and 6 feet wide, and was only partially filled with coral rubble. On top of the fill lay several large slabs.

Sites H and I. Almost 100 yards further to the northeast and paralleling the shoreline stood a pair of partially crumbled platforms with low curbing of rough and pointed conglomerate slabs set on edge (Plate 5). They were roughly built compared to the platform of Site A (Plate 1), lacking the even ends and tops of the walls (sic) slabs. Sites H and I were filled with rough rubble within a few inches of the top of the walls. Site H measured 9 feet in length and 8 feet in width. Outside the southwestern corner a slender pointed stone 2 feet 6 inches high, had been erected. Site I measured 15 feet long and 9 feet wide. On the south side of the platform were laying long broken slabs, which did not appear to have been part of the curbing. Possibly they were erect and had fallen from loosening of the fill.

Three shallow pits about 3 feet in diameter and 1 1/2 feet deep were found, one 15 feet west of Site H and two about the same distance south of H and I (Plate 5). They were of insufficient size to be excavations formed by taking fill from the platforms. It is possible that they were pit ovens, although any evidence of former fires had been washed away. Ten other pits were found some distance south of the line of platforms C to G.

Site J. Platform stood about one quarter of a mile from Sites H and I. It was constructed on much smaller proportions and similar to Site U found on the east side of the island. Platform J differed from H and I in having an erect stone slab at each end and the walls made of irregular conglomerate slabs set on end, giving a greater height to the terrace. The end monoliths had toppled over but were set in their original holes for the photograph (Plate 6). This structure varied in its orientation from the others on this side of the island by its long axis north and south. The other platforms were oriented northeast and northwest, parallel to the line of the coral ridge.

The platform J was 12 feet long 7 feet 6 inches wide - the erect wall slabs measuring 1 foot 8 to 10 inches in height. The monolith of irregular shaped coral at the north end was 3 feet 4 inches high; the pointed one at the south end was 3 feet 10 inches high. The west or sea side of this structure was removed and the ground beneath excavated for a depth of 4 feet in search of burials, but no trace of bone or human possessions was discovered. This site was comparable to a general type of Polynesian grave.



Site K. A badly crumbled, small shrine-like structure stood a short distance northeast of Site J. The structure and size of Site K— 6 feet long and 4 feet wide, with walls 1 foot high — were approximately the same as the little shrine, Site D. Site K had however, two upright slabs side by side, on the north side, instead of one behind the other. The western upright was triangular in shape, 1 foot 9 inches high and 1 foot 7 inches wide at the base. The eastern slab, roughly rectangular, was 2 feet 6 inches high and 1 foot 10 inches at the base (Plate 7).

Site L. Beyond the shrine K, the paved path was picked again by the Zaca party on the second day of exploration. Site L was found about and eighth of a mile beyond K. Bigelow records this site "...is about half a mile south of the northern point of the atoll. Here I found a platform 11.4 feet by 6.3 feet by 1.7 feet high. It is in excellent condition, and is formed by a row of slabs set on edge with the center filled with small broken coral..." Beyond this point a fairly clear and well worn path in the coral gravel, ran to a destroyed cairn, Site M. Due to its condition, the original form of this cairn, Site M, could not be deciphered. The path continued from here across an undulating plain of coral rubble piled up from a series of storms that had swept the north end of the island. On the shingle above the beach at the northern point stood another platform, Site N. This platform was in excellent condition and stood between 2 and 3 feet high, the highest platform remaining in Sydney Island. Its dimensions were approximately 12 by 6 feet. The walls were made of slabs laid horizontally.

Along the northeastern beach, three paved paths were found leading from the water's edge to the bush behind the shingle ridge. As far as the bush could be penetrated, we could not observe any structures to which they might lead. Bigelow found similar paved paths from bush to beach between the eastern beacon and Site U.

Site P. About 150 yards north of the southeast point of the atoll was a cairn of coral slabs. (Should this be Site O?)

Site P. Just above the southeastern point was (a) platform, Site P, in excellent condition. Bigelow gives its dimensions as 11.5 feet by 6 feet by 2 feet high. The walls were built of coral slabs laid horizontally, the center filled with small broken coral. Below the southeastern point was the remains of navigation beacon built in 1916, according to Bigelow, for a copra schooner working the island.

Site Q. The first party of the Zaca Expedition turned inland from the beacon toward the east end of the lagoon. Not far from the lagoon shore and south of an old dock, a structure was found that is unique among the Sydney stone remains. It has a paving about 14 feet long and 3 or 4 feet wide made of limestone slabs laid on edge like thin cobblestones. This platform faced the lagoon and had along its back edge several (perhaps as many as seven) upright slabs ranging from 3 to 6 feet in height. This was considered to be a platform resembling eastern Polynesian ~~marae~~ marae but Bigelow's notes concerning both ancient and modern Polynesian graves on the island suggest that Site Q may have been also a row of early graves.



Bigelow did not rediscover this structure. At Site V Stuart's party from the Zaca discovered this site on the first day and returned to it again the second. They excavated beside the uprights but unearthed nothing of archaeological interest. Six members of the Zaca expedition saw this site. However, Bigelow could not locate it, nor did his inquiry among the native islanders on Sydney in 1939 reveal that they had ever seen it. Bigelow's guide, Kima, had been all over the eastern end of the island when coconut trees were being planted in 1905, and yet he had not known of it. It must remain a problematical structure until it can be located and photographed again.

Site R. Within the thick brush and tree growth of this area, stood a squat tower built of waterworn coral slabs. Adjoining one side of its base was a circle of stones, the two looking much like a crude and heavily built fireplace and chimney. However, neither showed signs of fire. This structure standing about forty or fifty yards from the roadbed of an abandoned guano tramway, and some distance from the lagoon end of the line, showed no apparent connection with this enterprise, nor did its strange shape offer any clue to its origin or purposes with early Oceanic visitors. The tower walls were laid in the same fashion as some of the platform walls on this atoll and at Hull, but this gives no certainty to a prehistoric construction.

Bigelow also located this queer ruin and has the following to say about it. "The structure is a cylindrical tower of coral slab, with a square platform in front. The cylinder is 3 feet in diameter, solid and 5 feet high. The platform in front is built up of slabs laid like bricks, and is 4 feet square and 8 inches to 1 foot high. Kima (Kima Jack Pedro, his Tokelau guide) guided me to this spot, as he had seen it before when he had helped to clear all this area. He was much surprised at its dimensions, as he had remembered it as being much larger. He also stated that the last time he had seen it the platform was intact, and securely decked over. He also said that one of his companions at that time had been much interested in the structure, and he believed that his friend had returned and rifled it. The broken condition would bear out this suggestion.

Site S. At the eastern<sup>n</sup> end of the lagoon is a stone dock which continues as a short tramway into the bush. This was evidently part of the guano works which were in the pits, now swamps, at the eastern end of the island. North of the dock and on the lagoon edge were six piles of rock sites. One still intact was 2 feet 6 inches by 5 feet by 2 feet 6 inches high according to Bigelow. Formerly these had been surrounded or covered by the water of the lagoon and were probably used for catching fish. In other Polynesian atolls, similar piles are built to attract smaller fish in shallow waters, and then surrounded by a net. The piles are then torn down and the escaping fish grasped or snared. It seems probable that these are the piles the British Survey of 1889 referred to as ancient stone weirs. (16).

Site T. On the southern shore near the southeastern point of the island was (a) coral heap about 3 feet high and 20 feet in diameter.



Bigelow's photograph shows around the base a number of coral slabs, indicating this may have once been a platform with the fill now spilled out.

Site U. Close by to site T was a small platform with curbing of slabs set on edge. In the southeastern corner is a slab or upright about 3 feet high. The curbing stands about 2 feet. (sic) The dimensions of this platform were 12 feet 5 inches by 5 feet. This platform was first reported by Bryan in 1924.

Sites V and W. Bigelow reports finding 13 ancient graves, well eroded by the elements. They were located south of the tramway a little distance from the modern village on the southwest point of the island. These graves were rectangular in shape, measuring 6 feet by 3 feet. They were marked by a low curbing, but had no head stones. This was in distinction to nearby modern graves, whose headstones were marked with names and the date 1905. The dated graves looked very recent in comparison to the nineteen graves of Site V. Still further on, he remarks, "there were five low circular mounds of coral gravel, four of them in one line and the fifth off the line a little. There was no indication of their origin or purpose."