

the morning of the 2nd, unto whom I delivered over charge of the Bight Division.

The Abaki of Abbeokuta has lately made application for a Naval Officer to conduct the defence of his town. One thousand musket ball cartridges and 5000 percussion caps have been supplied to him from the *Crane's* magazine. I understand that the King of Porto Novo, who is tributary to the King of Dahomey, has already 2100 soldiers in the field,—on the march. It is to be presumed that the King of Lagos will assist the Egbas, who are the inhabitants of Abbeokuta; at least there can be no doubt that he will espouse their cause, dreading lest the fall of Abbeokuta should merely be a prelude to the destruction of Lagos, though his cooperation may turn out to be more passive than active.

The names of certain notorious slave dealers are,—Iambo, Machado, Marco, Carvalho, and Lennado.

[The life of the noted slave dealer Kyetan will be found in our volume for 1852.]

#### ISLANDS AND REEFS IN THE WESTERN PACIFIC OCEAN.—By H. M. Denham, Captain, R.N., H.M. Surveying Ship "*Herald*."

[The following substance of a letter to the Hydrographer of the Admiralty will be read with interest by our friends, and especially those acquainted with or about to visit the parts to which Captain Denham alludes. Some curious inaccuracies in the charts will be evident on the perusal of it, that seem, as usual, to have been the receptacle of imaginary as well as real dangers incorrectly placed, while a remarkable corroboration in the position of the Minerva Reef will be seen as given by an American whaler in our number for April last. The visit to the Solomon Islands, concerning the fate of the unfortunate Mr. Boyd, proved no less unsuccessful than that of H.M.S. *Serpent*, related by her Acting-Commander U. L. Hammet, in our last year's volume (February, March, and April numbers), except in eliciting a proof of the event of that gentleman's death. This visit of Captain Denham has, however, been fruitful in Hydrography, and although interrupted in his interesting and important survey of the Fiji Islands, which he was following with his usual zeal, contributions from the Solomon Islands will thus swell the amount of valuable additions made by this officer to our charts: showing that the accomplished maritime surveyor can gather fruits of industry important to his fellow seamen wherever chance may lead him in the wide field of hydrographic labour afforded by the ocean.—Ed.]

By June 28th, 1854, I had traversed a space embraced by thirty miles of latitude and ninety miles of longitude, so closely as to satisfy myself that a reef laid down in lat.  $31^{\circ} 27' S.$ , and long.  $178^{\circ} 0' E.$ , does not exist; our sounding efforts could not find bottom in 852 fathoms.

I then made for the easternmost position assigned to the Rosaretta Reef, lat.  $30^{\circ} 25' S.$ , longs.  $179^{\circ} 8'$  and  $179^{\circ} 15' E.$ ; and after giving

it a margin of thirty miles of latitude and sixty miles of longitude, and essaying for soundings in the vicinity, and eventually dropping the lead at the assigned spot to the depth of 930 fathoms without finding bottom, I was constrained to decide in my own mind that it was another of those fabulous dangers which stud the charts of these seas.

The seeking for and obtaining sufficient data for expunging these two reefs, brought me into the neighbourhood of the Kermadec Group, and as the space between those islands and the reported Vasques Island to the N.E., and the Minerva Reefs due North, forms the highway between Western America and our Australian Colonies, besides New Zealand, I set about determining the actual relative positions of the northernmost island of the Kermadec Group, and the northern limits of that passage.

It was not until the 24th of July that the then winter and boisterous season enabled me to conclude the survey of Sunday Island,\* the which I found offered three anchorages according to winds, and that water, vegetables, and poultry could be procured by whalers during the summer, i.e. the whaling, season. The Observation Spot in West Bay was found to be in lat.  $29^{\circ} 15' 30''$  S., long.  $177^{\circ} 54' 52''$  W. Variation  $11^{\circ} 18'$  E. High water, full and change, 6h.; rise 5 feet. Its maximum altitude is 1627 feet. Its only inhabitants consist of one family from New York, by the name of Halstead, and to whose humane disposition I shall ever feel indebted under the trying circumstances of my having to inter a beloved son close to their settlement.

Proceeding from Raoul or Sunday Island to the northward, I searched between the parallels of  $28^{\circ} 6'$  and  $28^{\circ} 30'$  S., and between the meridians of  $176^{\circ} 6'$  and  $178^{\circ} 24'$  W., for two islands laid down respectively in lat.  $28^{\circ} 30'$  S., long.  $176^{\circ} 50'$  W., and lat.  $28^{\circ} 14'$  S., long.  $178^{\circ} 13'$  W., and certainly such islands do not exist thereabouts. Nor could I trace a sign of Vasquez Island between the parallels of  $24^{\circ} 20'$  and  $26^{\circ} 30'$  S., intersected by the meridians of  $174^{\circ} 40'$  and  $177^{\circ} 40'$  W. Neither does the reef exist which is laid down in lat.  $26^{\circ} 2'$  S., long.  $177^{\circ} 0'$  W. I searched for this reef, its assigned position placing it right in the fairway between the Kermadec Group and Minerva Reefs, with the keenest anxiety over a space bounded by thirty miles of latitude and one hundred and fifty miles of longitude, trying for soundings throughout the space, and dropping the lead over the assigned spot into 400 fathoms without finding bottom.

I had worked my way up to the Minerva Reef region by the 10th of August. This region presented on the charts and in the catalogues of maritime positions a nest of reefs spreading between the parallels of  $23^{\circ} 30'$  and  $24^{\circ} 0'$  S., and the meridians of  $178^{\circ} 0'$  to  $180^{\circ} 0'$  W. This nest of reefs, under the several names of Minerva, Nicholson, and Favourite, I had the satisfaction of reducing to *two* positive reefs upon which I landed, surveyed, and fixed as the North and South Minervas, nineteen miles apart, uncovering at half tide, always show-

\* This appears to be the same as Raoul Island, by Captain Denham's remarks.

ing out by their breakers, and lie respectively in lat.  $23^{\circ} 37' 19''$  S., long.  $178^{\circ} 48' 58''$  W., and lat.  $23^{\circ} 56' 22''$  S., long.  $179^{\circ} 4' 16''$  W. I obtained soundings and brought up the bottom at 967 fathoms about midway between them. The greater part of this sounding consists of the shells of many microscopic species of Foramsensera. It also contains several specimens of a styliola or exescis, abundantly taken everywhere in the Pacific in the towing net. Mixed up with the sand there are a few fragments of dead slender *cellefrossa*, a piece of a *bulia*, one perfect and several imperfect plates of a *balanus*, and several minute detached crystals of smoky quartz, prismatic, and terminated by five-sided pyramids. This actual specimen of the bottom at 967 fathoms depth, will be forwarded by the first careful hand I can trust it to, with those brought up 300 miles off New Zealand. I found the tide-hour at these reefs to be the same, viz., eight o'clock, and the tidal rise measured six feet. The magnetic variation underwent no disturbance upon the reefs, but come out in confirmation of our ship observations, viz.,  $10^{\circ} 47'$  E. These reefs measure thus:—the North Minerva three and a half miles diameter North and South, and three miles across East and West. The Southern Minerva is two miles diameter from East to West, and one and a half miles across North and South, and both partake of the Atoll character.

By placing Sunday Island where it really is, by expunging the two reported islands sixty miles northward of it, by showing that Vasquez Island does not exist there, and by defining the actual number and positions of the Minerva Reefs, and by sweeping away that *vigia* between which I have referred to as assigned to lat.  $26^{\circ} 2'$  S., long.  $177^{\circ} 0'$  W., we widen that important but as yet unnamed passage nearly one hundred miles.

Having accomplished the foregoing positive as well as negative results, to the great relief of the future voyager, I was at liberty, on the 31st of August, to enter the Fiji Archipelago. Levuka Harbour, at the Island of Ovalau, invited me as the most tranquil position for rating chronometers, to adjust my recently traversed ground. But I could not forego seeking anchorages and obtaining sights, to add to our chain of meridian distances, as I passed the beautiful Islands of Moala and Angau. I did not find our safe-guards, the Missionaries, at these two islands; but we had the benefit of their wonderful influence through the native teachers whom they had sent. Therefore, while our astronomic data was being obtained, we procured refreshments, made acquaintance with those who will be glad to see us again, and, in tranquillity I could not have anticipated, we visited the heights, intersected the intervening reef, called Mum-bo-li-the, and surveyed the harbours Moala and Angau. The Harbour of Moala we make in  $18^{\circ} 32' 45''$  S.,  $179^{\circ} 57' 38''$  E.; and that of Angau  $17^{\circ} 59' 32''$  S.,  $179^{\circ} 13' 45''$  E.

On the way from Moala to Angau I placed the ship alongside of the intervening reef Mumbolithe, and, by boats, determined its features and relative position. It proved to be of coralline structure, awash at low water, presenting an oval rim: the smooth pool within not acces-

sible. It measures one mile by 0.6, and lies 5.8 miles S.  $18^{\circ}$  W. from the islet off the S.E. extreme of Angau, which places it in lat.  $18^{\circ} 14' 36''$  S., long.  $179^{\circ} 17' 50''$  E. Between this reef and the boundary reef of Angau, five miles and a half apart, I obtained soundings (coarse white coral grit) in 753 fathoms, each reef being so steep to as to give no soundings in 200 fathoms half a mile off.

Thus linking the islands, I found myself in the Harbour of Levuka, where a few white settlers, English and American, with their handy little coasting craft, presented a promising scene amidst a vast native population. Here I found the Missionary Station, anxiously and gratefully verified. We were looked upon as their friends and supporters, and, as no vessel of war of any nation had been there for nearly three years, I soon found my judicial services were solicited by English, American, and native traders, and by French as well as English Missionaries: in the course of which I esteemed myself fortunate, and you will be relieved to hear, that, so far from being embroiled, I elicited thanks.

Levuka Harbour was forthwith surveyed and the heights of Ovalau soon occupied to throw off the great trigonometrical diagram which was to be the basis of a vast field of work, comprising islands and reefs in countless array. But, after some progress, I was suddenly broke off, i.e. one month sooner than recruiting health and supplies at Sydney would have suggested, by a report that Mr. Boyd, of the *Wanderer* yacht, (of sad story in October, 1851,) was alive and had marked many trees at Guadalcana, Solomon Islands. Accordingly I left the Fiji Group on the 24th of November for the Solomon Islands.

Our sojourn at Ovalau had afforded us excellent opportunities for rating, and I always looked to clinching the longitude by a smart trade-wind run to Aneiteum, New Hebrides, on my way to Sydney, with which I last year (1853) satisfactorily settled Aneiteum and Isle of Pines. I therefore took Aneiteum in my way, accomplishing the run in four days. This meridian distance completed the circle and resolved the longitude of Levuka  $178^{\circ} 49' 45''$  E., while its latitude had been determined by us as  $17^{\circ} 40' 45''$  S.

At Aneiteum the Missionaries supplied us with as much flour and sugar as averted my placing the ship's company on short allowance while diverted from our previously contemplated route.

From Aneiteum I proceeded to Port Resolution, Tanna, with a hope of shipping an interpreter for the Solomon Group; as also that I longed for an opportunity of obtaining some counter observations from the volcano which I had, in 1853, intersected from Aneiteum and Footuna. I did not succeed as regarded the Interpreter, but I did obtain, with the able assistance of Mr. Smith, the true bearing data desired by Raper in his foot note to page 363 of his third edition, regarding the relative positions of Tanna, Aneiteum, and Erronan.

Without interpreter, but with good rates and departure and good hearts, I made for the Island of San Christoval; and, come what might of our errand of mercy, I determined to obtain some acceptable matter for your reception. We had many plans to organize, plenty to

occupy executive attention, but I could dedicate Mr. Smith to a course of operations; and so, both along the coasts and at the several anchorages of San Christoval and Guadalcana, the interests of hydrography were advanced. At San Christoval I surveyed the beautiful Harbour Makira, situated in lat.  $10^{\circ} 25' 23''$  S., long.  $161^{\circ} 26' 39''$  E., variation  $8^{\circ} 40'$  E., with its Cape Phillip in  $10^{\circ} 31' 23''$  S.,  $161^{\circ} 26' 35''$  E.; and of Guadalcana, its Cape Henslow was determined as in  $9^{\circ} 58' 42''$  S.,  $160^{\circ} 34' 55''$  E.; Cape Hunter  $9^{\circ} 49' 10''$  S.,  $159^{\circ} 47' 10''$  E.; while the fatal bay (Wanderer Bay), mouth of Boyd Creek, was settled as situated in  $9^{\circ} 41' 47''$  S.,  $159^{\circ} 39' 34''$  E., var.  $8^{\circ} 40'$  E.

Our exertions to ascertain Mr. Boyd's fate is necessarily the subject of a distinct report. In a word, we elicited that he was put to death within a day or two of his capture in October, 1851, that no where was his name engraven, except upon two trees at Makeira, San Christoval, where he was a month refitting and where I found his letters and other tokens, dated six days before he went to Guadalcana. The only trace I obtained of him at Guadalcana was his tomahawk, which I have. They offered me a quantity of bones as of *his*, but the comparative anatomy would not do.

While the natives were consistently agreeing in the death, they were equally so in denouncing the Chief who did the deed, and identified him so completely to my satisfaction that I heard without compunction that he had fallen under our fire, after dodging and slipping from our hands. Our restraining and refraining from any act of retribution except regarding the avowed murderer—burning no other house or destroying any canoe except his—gave such unmistakeable evidence of our course of justice, and our two opportunities of saving parties of themselves when capsized amongst the sharks and their own people abandoning them, rendered our visit a fine preliminary to a good understanding with the Queen of England's flag and subjects.

I took such a course from the Solomon Group for Sydney as should cut up fresh ground. I satisfied myself that the Indispensable Reef of lat.  $12^{\circ} 12'$  S. does not stretch to  $161^{\circ} 30'$  E., as denoted on some of the charts. But I am enabled to state that a reef which was laid down by some pains-taking mariner in 1791 (in Arrowsmith's, though not in some other charts) does really exist. I anchored alongside of it for thirty-six hours, worked around its awash coral margin, contoured its bank of soundings, ascertained its dimensions to be half a mile by a quarter wide, and that it is situated in lat.  $21^{\circ} 0' 15''$  S., long.  $161^{\circ} 45' 9''$  E.

From this reef, which I call the Fairway because lying nearly midway between the Bellona Shoals and New Caledonia, I was obliged to make the best of my way to Sydney, to hurry my crew out of the effects of the tropical heat; which, with unavoidable privations, had placed one-fourth of us in the sick list.

[In our last year's volume (p. 365) will be found some former observations of Captain Denham's on Pacific Islands and dangers; and in the same volume his remarks on St. Paul Island, Indian Ocean.]