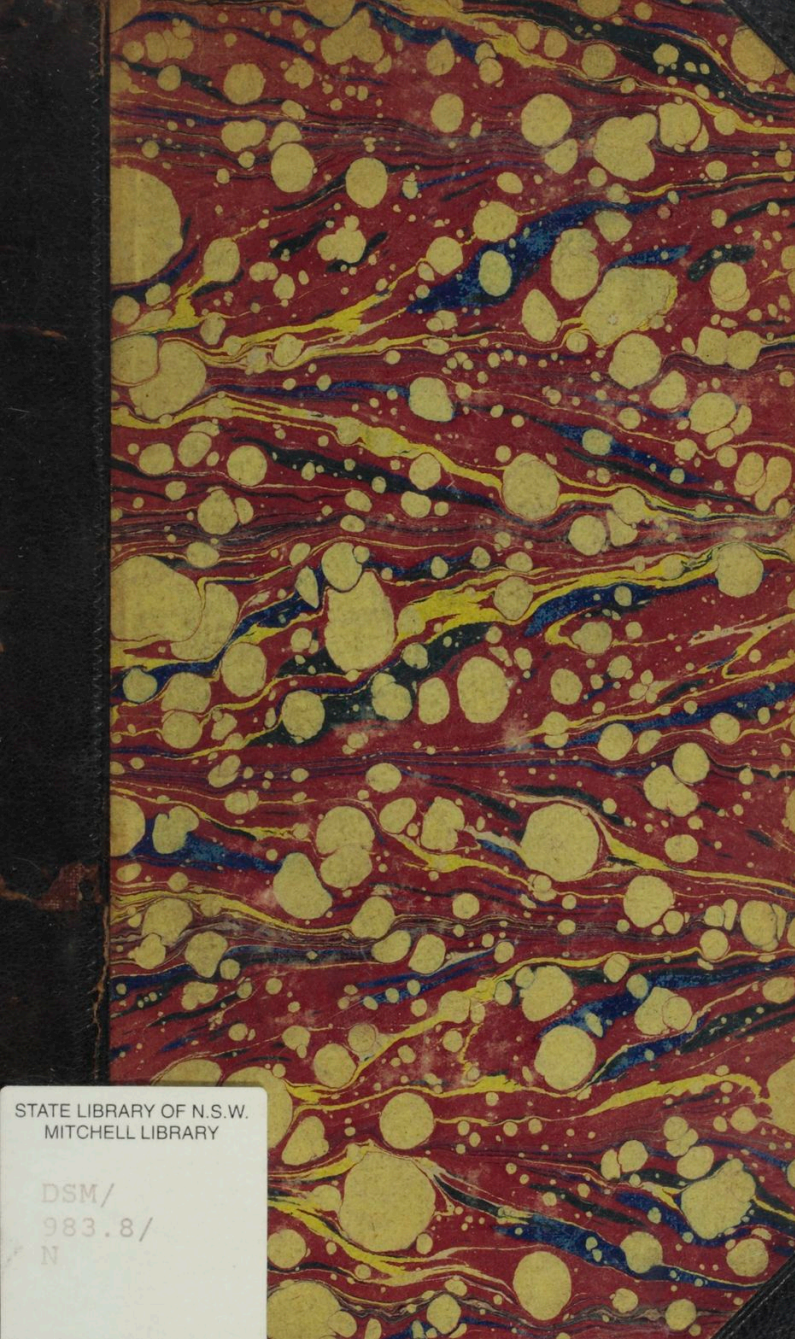

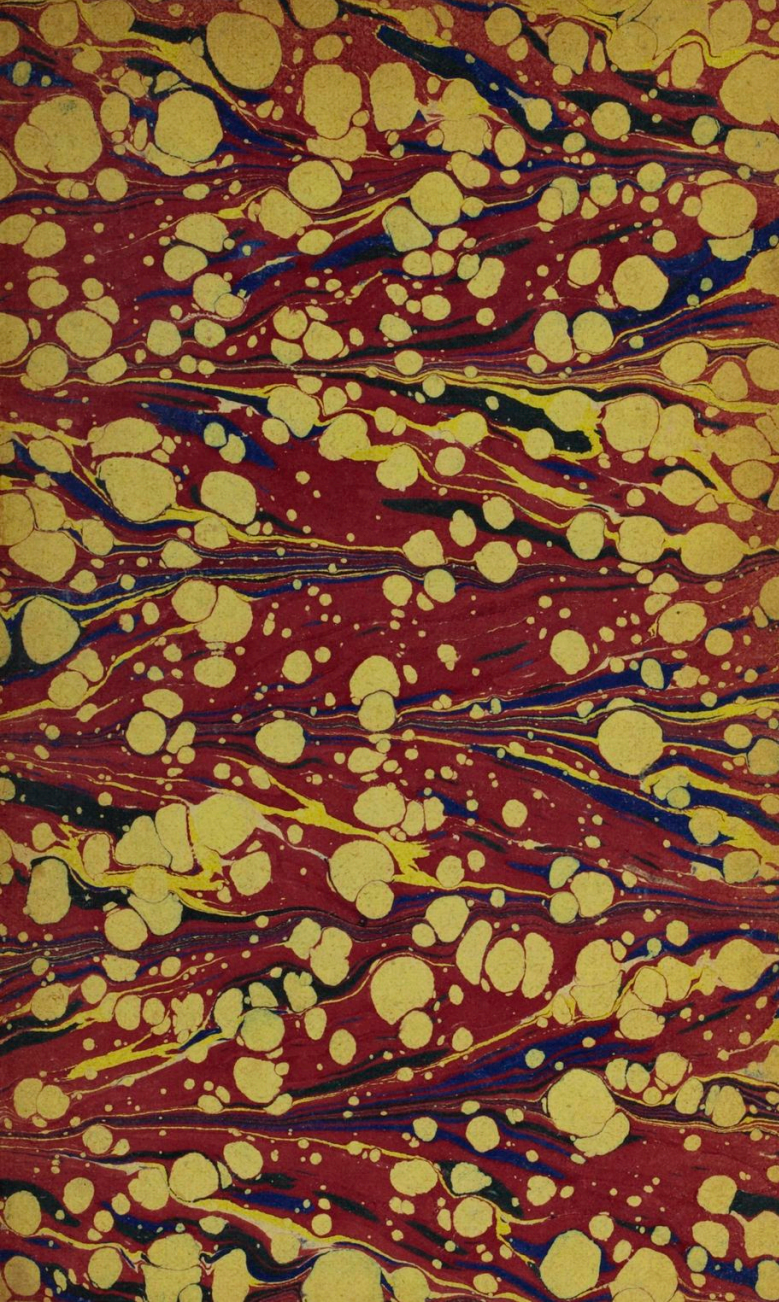

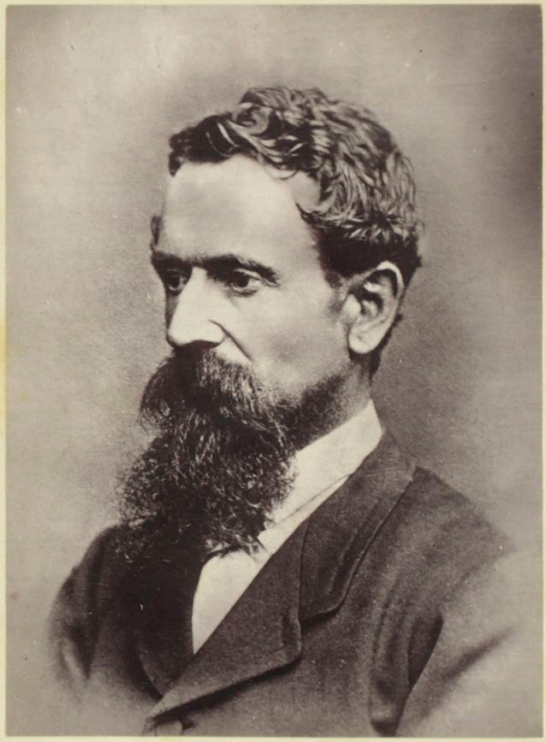

NOTES OF A VOYAGE

FROM

NEW SOUTH WALES

TO THE

NORTH COAST OF AUSTRALIA,

FROM THE JOURNAL OF THE LATE

FRANCIS NAPIER.

D. Mitchell's.

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ERRATA.

Page 12,	line 10,	for	"Mytulus,"	read	"Mytilus."
„ 12,	„ 11,	„	"Solon,"	„	"Solen."
„ 59,	„ 22,	„	"Saliconia,"	„	"Salicornia."
„ 62,		„	"Bourke,"	„	"Burke."
„ 63,		„	„	„	„
„ 64,		„	„	„	„
Map,			„	„	„
Page 84,	„ 24,	„	"Sans atout,"	„	"Sans atouts."

CONTENTS.

PLATES.

MAPS.

INTRODUCTION.

In the year 1867 the South Australian Government sent an expedition to the north coast of their territory to discover desirable localities for settlements.

Mr. Francis Napier, the second son of David Napier of Glenshellish, Argyllshire, and Millwall, London, whose connection with the early development of steam navigation is so well known, joined it.

On the 23rd December, 1875, while preparing a short account of his voyage for the Philosophical Society of Glasgow, he died.

The following Notes, extracted from his journal and embodying the above account, which I communicated to that Society after his

death, are submitted by his sisters for whatever may be interesting, scientifically or otherwise, connected with their brother's voyage.

Unfortunately, no map or track chart has been discovered among his papers, but merely fragments of surveys. On a reference, however, to the last Admiralty chart, 1871, of these regions, I find some, if not all, of his survey work embodied in hair lines—the new channel which he surveyed being called "Cadell Strait," from the name of the chief of the expedition, and the peninsula on its southern side "Napier's Peninsula." On the general chart I have endeavoured to trace his voyage; the other maps are from his own drafts.

Mr. Wm. Keddie, F.R.S.E., has kindly supplied some explanatory notes; and a few sketches by one of my sons, which have been very simply produced by a process of Maclure & Macdonald's which ought to be better known, have been added. Drawn merely on their autographic paper with lithographic crayon, they

are transferred direct to the stone, and are fair representations of the originals, having been correctly outlined to the required size by the pantograph.

The expedition, under the command of Captain Cadell, started from Newcastle, New South Wales, calling at Brisbane, Port Denison, Cape York, &c.

From Cape York it crossed the Gulf of Carpentaria to the Liverpool River. After surveying that river and exploring the coast for about 100 miles east and west of it, it returned for provisions, &c., to Burke Town, on the Albert River, at the head of the Gulf of Carpentaria, passing through Cadell Strait, and along the west coast of the gulf, remaining some time at Maria Island, during which it made an unsuccessful search for the entrance to the River Roper, which the explorer Leichardt had crossed in the interior on his second last journey across the continent. From

Burke Town the expedition returned to Maria Island, and on this occasion discovered the entrance to the Roper. From the Roper it returned to Liverpool River, thence sailing westwards to Mount Norris Bay, Adam's Bay, and Victoria River, in search of fuel, food, and water; but failing to obtain these at the latter places, it had to make for Kœpang, in the Island of Timor, where it arrived in a very exhausted condition on the 19th November. After refitting, it returned to Sydney *via* Port Denison and other Queensland ports.

JAMES R. NAPIER.

BLYTHSWOOD SQUARE,
GLASGOW, *June*, 1876.

NOTES OF THE VOYAGE.

We left Newcastle, New South Wales, on the evening of the 5th of April, 1867, in the old wooden steamer "Eagle," with our tender, the "Firefly," towing astern, and arrived at Brisbane on the 9th.

We there visited the Botanic Garden, the Director of which shewed us all that was interesting. Among these were the sweet-scented Moreton Bay lily, which he said we should also find farther north; a large guava tree full of ripe fruit, of the size and colour of a lemon; the Brazilian cherry tree, with its beautiful scarlet ribbed fruit and pleasant acid taste; the cinnamon tree; the allspice; the coffee tree in full fruit, growing very luxuriantly; and a singular looking Chinese fruit, with its seed outside.

For two days previous to our arrival at Port

Denison we were sailing almost wholly among islands, with the sea so beautifully smooth, that it was like an excursion on a Scottish lake.

The town Port Denison, or Bowen, was in a very dilapidated condition, from the effect of a hurricane which had passed over it about three weeks before our arrival. Many of the houses had been blown away, and almost every one shewed some mark of the violence of the storm.

Denison, as seen from the sea, is barren in the extreme, the granite mountains in the neighbourhood being nearly destitute of vegetation. One of them, Romeo Peak, is remarkable for its great conical peak and isolated position, glistening when the sun shines as if it were covered with snow.

Within a few miles of the town, however, there are fertile plains of considerable extent, with grass from six to eight feet high. Some of the plants seen during a short excursion were the yellow, white, and red varieties of the hibiscus, a scarlet passion-flower, many varieties of papilionaceous plants, various species of convolvulus, the beautiful blue water-lily, with its delicate scent. The coral

and bottle trees were common. White cockatoos and quail were plentiful, also cranes, and the footprints apparently of an alligator were seen.

The hurricane which had devastated Port Denison on 3rd March had destroyed also a great part of the township in Cleveland Bay. Many of the houses were still in the position they were left by the gale, having been moved from their original places, some of them turned over, others a mass of broken timber. We found on the beach pieces of galvanised iron roofs, at a distance of two miles from the town. The beach itself had a beautiful fresh emerald green look, which we found on landing was caused by a species of convolvulus with large leaves, like that of a broad bean plant.

After sunset the air appeared as if filled with meteors, caused by the brilliant bluish light which the fireflies emitted in their flight. When caught they gave sufficient light to read small print by. On a reef which runs out about one and a half miles from an island in the bay, and which dries at low water, fine specimens of coral and shells were collected. The pearly nautilus appears common, as well as

a species of strombus, ptericoras, rostillaria; many species of murex, ranella, triton, turbinella, pyrula, fusus, buccinum, nassa, ricinula, columbella, dolium, cassis, oliva, conus, bela voluta; immense specimen of melo; many species of cypræa, natica, cerithium, trophon, Turritella, scalaria pretiosa, litorina, solarium perspectivum, nerita, trochus, patella, chiton, ostrea, placuna, pecten, spondylus, pinna, mytulus, arca, chama, cardium, cardita, venus, cytherœa, mactra, tellina, solon, &c.

Magnetic Island, at the entrance of the bay, is about 2,000 feet high. It has not been found to possess the attractive qualities ascribed to it by King. At Fitzroy Island, a station famous for its pumpkins, and where vessels often call, the pumpkins had been cleared off, apparently about fourteen days previously, by a passing vessel. A notice attached to a tree informed us of her movements. They had forgotten, however, to remove their hammer and tacks, as these were found in a hollow of one of the branches. Ripe fruit, about six inches long and three inches diameter, having the appearance of a melon, but much superior in flavour, was obtained from a species of palm tree. The

beach was composed entirely of broken coral, beautifully pure and white.

While passing Lizard Island about noon, on the 24th April, we saw a vessel lying at anchor in one of the bays, and a small boat making its way towards us. It appeared that the vessel was a three-masted schooner, which was supposed to have been lost in the late hurricane. She had left the Albert River in Carpentaria two and a half months before, and had been detained by contrary winds. Fourteen passengers were on board, short of provisions, whom we relieved with a bag of biscuits and another of flour from our stores. On a square stone building which we found on the island was a large black cross, with the words "DIG UNDER" painted in large letters, indicating where a depot of provisions had been left. Those who had long since removed the provisions had not thought it necessary to remove the intimation.

Cape Melville has a singular appearance from the sea: it is from 1,000 to 2,000 feet high, and formed of huge boulders heaped one on another in the wildest confusion, with little or no vegetation; and for more than a mile out to sea little isolated pinnacles just shew

their heads above water, causing vessels to give it a wide berth.

In many places during the last few days, sailing among so many islands, the only indication of land being near was the appearance of stunted trees, growing as it were out of the water. Their appearance so far from the mainland or larger islands struck me as very singular. There was no appearance of rock or sand round them, but possibly at low water some of these would shew.

A sea snake, about six feet long, was seen about noon on the 25th, swimming with its head erect close past the ship; it afterwards dived underneath.

While passing Cairncross Island, near Cape York, on the 27th, Captain Cadell thought that he saw some of the natives, and sent a party ashore in the small boat to communicate with them. They found on the beach a canoe hollowed out of a log of about two feet diameter, with an outrigger on each side, and in it a conch shell about twelve inches long, filled with fresh water. Three naked natives with spears appeared in the distance; they could not be induced to approach the boat party, but

beckoned to them to put away their guns. Seeing this, Captain Cadell recalled his men and went ashore himself, with biscuits and tobacco, which he left in their canoe, the natives being too timid to approach him.

The township of Somerset, Cape York, is situated on the wooded slope of a hill, with Albany Island in front. It consists of about half-a-dozen houses nestled among the trees. On entering the strait we were struck with the novelty of the high sharp-peaked ant-hills, which look like sentries with their military cloaks on. The constellation of the Great Bear was here seen by some of us for the first time after a lapse of fifteen years, recalling scenes and events of former times. Both the Southern Cross and the Great Bear being above the horizon at the same time, we had a good opportunity of contrasting them, and certainly could see no reason for the raptures bestowed by early navigators and travellers on the former. The head of the Little Bear was also visible; in fact, with the exception of the Pole Star itself, there is no star above the fourth magnitude which does not pass in review in the course of one fine night here.

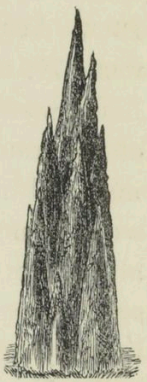
The climate appears to be very healthy and equable in temperature. From a meteorological register which had been kept by Dr Harm, the medical resident, the maximum temperature in the shade for the last two and a half years did not exceed 99° F., being 6° less than is sometimes experienced at Sidney; while the minimum in the same time was 68° F., or 30° higher than the Sidney minimum. In 1865 the rainfall was 54 inches, and in 1866 it was about 104 inches.

The natives are very harmless—fond of biscuits and tobacco, and do not touch spirits, having yet to reach that point in their civilisation. They are very lazy, wear no clothing of any kind; many of them are afflicted with coughs, no doubt caused by exposure to the heavy dews at night.

H.M.S. "Salamander" was attending the settlement and surveying. Since the stoppage of the Torres Straits Mail Service she has been the only means of communicating with civilised society. When we arrived their latest news was six weeks old. A room about twelve feet square—the jailor's house—was the church. On account of the heat one-half of the prayers

were read on one Sunday, the other half on the next. The clergyman, Mr. Jagg, presented me with some beautiful butterflies. Among Dr. Harm's collection of birds were some brilliantly coloured small pigeons, a white hawk, an owl, and some very fine kingfishers.

In the woods at Newcastle Bay, about two miles south of Somerset, we found numbers of a large species of helix, and in the clear spaces the ant-hills, which struck us so much on entering the strait. Some of them were fourteen and fifteen feet in height, and so small in diameter at the base and sharp at the summit as to resemble Gothic spires. They were the habitation of a species of white ant. Bananas and pine apples were thriving in the gardens of some of the residenters. Some of the black fellows, whom we dressed up in paper collars, scarlet neck-ties, and brass rings, were much pleased with their new clothing. Two of them, Tommy and Elijah, arranged to accompany us on our voyage to the west.



29th April.—We started from Cape York for the west, going through Endeavour Strait. The sea was intensely blue, and much more phosphorescent than we had seen it on our way north.

2nd May.—Wessel's Land was passed during the night, and was in sight at nine A.M. The temperature of the air and sea was 84°, and a spirit thermometer exposed to the sun shewed 136°. At three P.M. the temperature of the air was 87°; the sea was of a pale green colour. Land was visible from right ahead to abreast of the beam. At five the country was improving, and many natives, their huts and fires, were seen along the coast. One little fellow, about four or five years old, was running in the sea, apparently bathing. We came to anchor in a little bay in latitude 11° 58′.

On the 3rd we were entering Castlereagh Bay, and passed a very deep inlet, apparently the entrance to a large river. Great quantities of large flying fish were skipping along the surface of the sea at bounds of fifteen to twenty feet at a time, for 200 or 300 yards. Our course was S.S.W. when we put about to examine the inlet. It opened like a strait in an E.N.E.

direction, with open sea for about fifteen miles in that direction, making the land on our left a large island.

The navigation was now becoming difficult. The water getting shallower we ran aground, and the strong ebb tide laid us over on our bilge, much to the discomfort of the horses. The captain went ashore to make observations, and saw an encampment of natives in huts with ridge poles. Our anchorage was in latitude 12° 9′, and is one of the finest sheets of water and land-locked harbours in Australia, with sufficient depth of water for any vessel, and room for all the fleets of the world. The tide had left us nearly dry on the top of the reef.

In the afternoon we went in our tender, the "Firefly," to explore a river, and were probably the first white men who had viewed the primeval forests on its banks. The tide was setting strong up, there being a rise and fall of from ten to twelve feet at spring tide. After trying several branches, in which there was two to three fathoms water, we ascended one for about three quarters of a mile. We found another, which we purposed to explore at a

future period. The river appeared to be well stocked with fish.

4th May.—We were now in unexplored waters, keeping from two to three miles off the land. Several dense smokes were seen all along the coast ahead, as if the natives were telegraphing our approach; for a steamer must have been a strange sight to them. At 10.30 A.M. all the country from S.W. to W. was smoking, and large dense smokes were seen rising apparently out of the sea. The appearance of a reef extending from the mainland compelled us to alter our course. The sea was getting up; the water had suddenly shoaled from ten to two and three-quarter fathoms, with broken water all round. We had gone some miles farther to the westward than King had done forty-six years before, but with no better success. The Crocodile Islands stopped us, as they did him.

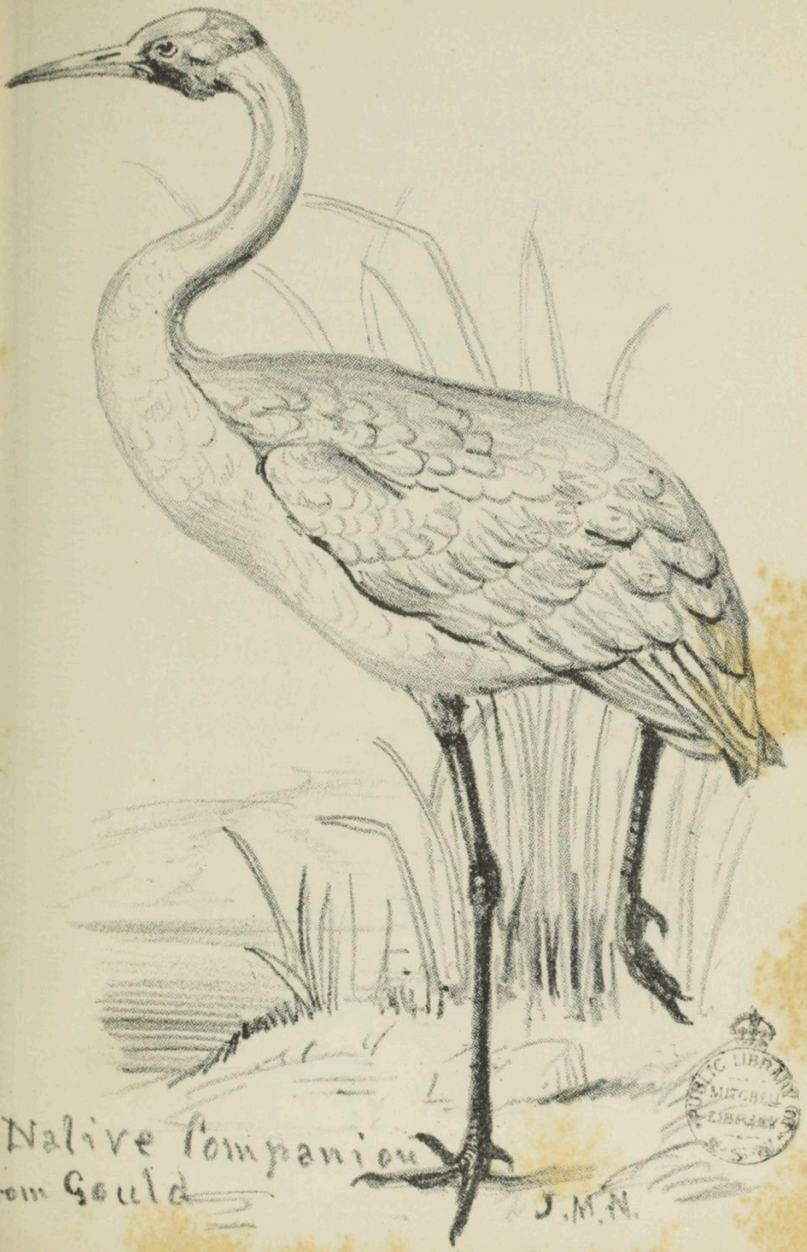
These islands are surrounded by such a labyrinth of shoals, rocks, and sandbanks, extending in a semicircle for about thirty miles from shore, that a vessel getting embayed among them would have very little chance of escape. We steamed among them during the day, look-

ing for a passage to the westward, but at nightfall, having found none, had to go north, to get into the track of King forty-six years before.

About noon on the 5th we anchored off Liverpool River, the lands in the neighbourhood of which it was our chief object to survey. At its entrance the river is about four miles wide, with hard wiry grass growing on its banks. The atmosphere, I remarked when sailing along the coast, was beautifully clear, so much so that while writing in the cabin, and accidentally looking up through the skylight, I saw about an hour before noon the planet Venus shining with great brilliancy.

Bat Island, about four miles up from our anchorage, appeared to be the headquarters of a large species of bat, which we saw flying about there after dark in great numbers. It was a mass of trees from sixty to seventy feet high, with foliage reaching to the water edge. In a plain intersected with creeks and marshes, we came upon about one hundred native *companions*, the *Grus Australasianus* of Gould, amusing themselves. It is a bird of about four feet high, easily captured, and not unfrequently tamed. Mr. Gould states "that when at Para-

matta he saw a remarkably fine specimen walking about the streets in the midst of the inhabitants perfectly at its ease. And a friend of his stated that a pair which he kept in the immediate neighbourhood of his house at Camden, and which had become perfectly domesticated, so far attracted the notice of a pair of wild birds as to induce them to settle and feed near the house, make the acquaintance of himself and other members of his establishment, and, becoming still tamer, to approach the yard and feed from his hand, and even to follow the domesticated birds into the kitchen; until, unfortunately, a servant imprudently seizing at one of the wild birds, and tearing a handful of feathers from its back, the wildness of its disposition was roused, and darting forth, followed by its companion, it mounted in the air, soaring higher and higher at every circle, at the same time uttering its hoarse call, which was responded to by the tame birds below. For several days did they return and perform the same evolutions without alighting, until the dormant impulses of the tame birds being aroused they also mounted high in the air, and winged their way to some far distant part of



the country, and never returned to the home where they had been so long fostered."

The mosquitoes were very troublesome in the mangroves. In order to examine one of the banks, which appeared to be a suitable place for landing the horses, the stem of our tender was run into the mud. Two men jumped overboard, but it was so soft that they sank up to their knees in it. The captain and doctor followed, taking flying leaps with the boat-hook, so as to jump as far as possible, but they almost entirely disappeared in it. The engineer and I, with some men, remained on board. As the tide had ebbed, leaving our boat fast, we amused ourselves catching little scarlet crabs that were running about on the mud. After enjoying ourselves in this way for about an hour, the captain and doctor were observed in the distance, returning in haste, chased by a number of natives. Our guns and revolvers were immediately loaded, and after getting the captain and doctor on board, we waited the expected onslaught. Presently our black enemy was seen peering at us from behind the trees, and we at them from behind sails and other protection from spears,

although as yet I had not seen that any of them had these weapons. Then two of their number came forward, and after a great deal of gesticulation and jabbering, which we did not understand, about a dozen more came out, and made signs which could not be misunderstood. Some good Christian had taught them the use, or rather the abuse, of that universal accompaniment of civilisation, strong drink, and their signs were for this. As there had only been one vessel up this river before our visit since King was here forty-five years ago, it was not difficult to trace the source of their knowledge.

They then commenced dancing, one fellow, the leader of the band, humming through a hollow branch about six feet long, another playing the bones, while a third went through the most comical movements and gestures, to the time of the band, quivering the thighs peculiar to the Australian natives, and always ending in a most extraordinary bound, in which he displayed great agility.

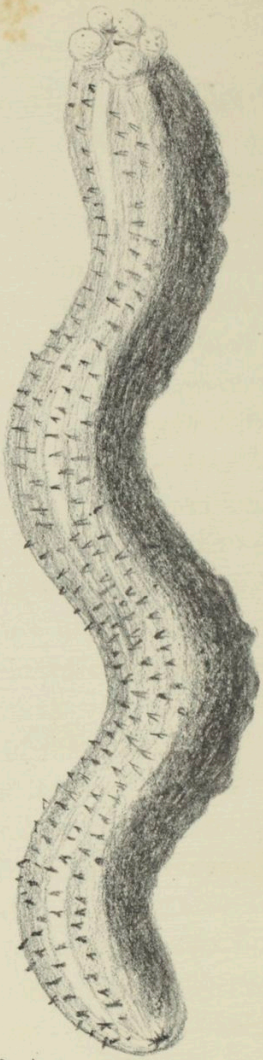
Some of our party thought that they were working themselves up for a general rush, others that this was to distract our attention

while some of their confederates attacked us from another quarter; so we were all posted, with rifles ready to fire on the first spear being thrown, yet bursting with laughter at the comical scene going on before us. But we found, as I had thought from the first, that they never meant mischief: they were overjoyed, in fact, at our visit, and had come down to welcome us, as they had been on friendly terms with the "Beatrice," which was here last year surveying. The performance lasted till we floated, when we gave them some biscuit and tobacco, with which they appeared quite delighted. They had two canoes, about twelve feet long by two feet broad, drawn up on the bank. They were made of bark, very ingeniously sewed at the bow and stern, and plastered over inside with moist clay, to keep the water out.

It was a magnificent starlight night as we returned to our ship, steaming along the sombre banks of the Liverpool River. The scene was such as can only be witnessed in a tropical climate. The phosphorescent water was sparkling with the brilliant coruscations of light from the ripple caused by the wind,

the flitting to and fro of the disturbed fishes, or the plunge of the crocodile; while around and above us were the fitful streamers of pale blue light emitted by the fireflies in their noiseless course. The silence was occasionally relieved by the cries of the night birds, or the crash of branches, as some lumbering alligator moved his unwieldy carcase through the mangroves, and the flight of the large bats that frequent these dark retreats, impervious even to the light of day. Unfortunately the enjoyment of such scenes is sadly marred by these tiny insects, the mosquito, which renders the river utterly uninhabitable for man or beast, the armour-clad alligator alone being able to put them at defiance. Even the midday sun does not prevent them from pursuing their relentless avocation on any unfortunate one who may be on shore in the mangroves. If Dante had visited this river before writing his *Inferno*, it certainly would have found its fitting record in his verse; or if capital punishment were converted into a compulsory clearing of its banks, a more useful or severe punishment could scarcely be inflicted.

On the 7th the "Eagle" steamed up to the scene of our encounter with the natives, and



Bêche de Mêr.
Holothuria Edulis

preparations were made for landing the horses. Some of them could at first scarcely walk; fourteen of them, however, disappeared during the night, notwithstanding their hobbles and their five weeks' detention on shipboard.

On Entrance Island, at the mouth of the river, I killed a carpet snake about six feet long, and saw a large species of bee. Spotted-winged dragon-flies were very plentiful, also the beautiful green ants which build their nests in trees. These ants are found at Port Denison and all along the coast. In riding through the bush, if one happens to come against a branch on which a colony of them are settled, one's face and neck become smothered with them, and as the horse gets his nostrils and ears filled with them, and is therefore not in the most tractable humour, but requires all one's attention to manage him, the tiny tormentors have time to devote their energies to the rider. Malay erections for preparing bêche-de-mêr were found, and several dry wells, but no water.

The bêche-de-mêr, trepang, or sea slug, is a very disgusting-looking animal, abounding all along the north coast. It is like a large black snail or leech, about twelve or eighteen inches

long and two inches in diameter, and has the convenient habit, when anything disagrees with it, of turning its stomach inside out. It is in great request by the Chinese and other Eastern nations for food, and is collected by the Malays, who send a large fleet of proahs every year with the N.W. monsoon, visiting every bay and island on the coast for the purpose of collecting and preserving it, the fleet returning with the S.E. monsoon.

14th May.—We started for Mountnorris Bay, about 120 miles to the west, to try to find a black man called White Bob, who had made himself useful in the "Beatrice." Approaching the Goulborn Islands we got a glimpse of the south and west of the Wellington Range and the Tor, the latter a lofty solitary peak, and the former apparently a broken range, exceedingly rugged, of detached masses, running parallel with the coast at about ten miles' distance. In fact, these ranges appear to be the commencement of that wild, almost impassable region, terminating to the east and south of the Alligator River in a continuous wall stretching from NE. to S.W. for sixty or seventy miles, and over which Leichardt, in 1845, had con-

siderable difficulty in finding his way, and which prevented Mackinlay, in 1866, from reaching the Liverpool River from Adams' Bay.

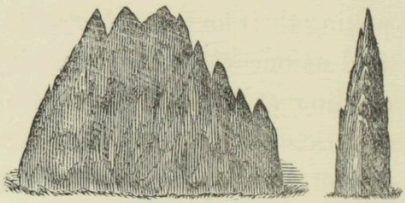
At Mountnorris Bay we found numerous tracks of buffaloes. The country was very clear of timber and easily penetrated. No mosquitoes, no flies, no bugs, no mangroves; in fact, as compared with the Liverpool River, a perfect paradise. We shot at many of the buffaloes, which were very plentiful, but our party was either too large or our rifles ineffective on their thick hides, as we killed none. The kangaroo was the only other mammal we saw here. The fishes here, as at every part of the coast visited by us, were very shy—we could catch none. Gum trees, tea trees, and cypress pines predominate. The pandanus is common, and the country is studded over with the same sort of conical ant-hills which were so plentiful about Cape York. One I measured here was sixteen feet high and six feet diameter at the base. Smokes were seen in various directions, but as yet we had seen none of the natives. The chief mate, however, found two, one of whom was dressed in Malay shirt and trousers, being the first we had seen on the

coast with any attempt at clothing. When White Bob was inquired for, he pointed away to the west, and used the word "Commandant" —a word, no doubt, got from the Malays, with whom they have constant communication for five or six months every year. A glass of rum was accepted by the gentleman in full dress, but refused by his nude companion, who was probably a teetotaler. Each had a front tooth out, and a hole in the cartilage of his nose. When presented with a pipe and tobacco, they set to work in the most approved European style to fill their pipes. They promised that White Bob would be at the ship by sunset. Bob, however, not making his appearance, we returned to Liverpool River. On our way back we passed a Malay proah running before the wind, evidently the last of the fleet. She had the Dutch tricolour flying, which we acknowledged by hoisting our national flag. She had one sail of great width. The Tor was very conspicuous about thirty miles off.

On our return to Liverpool River we found that six of our horses were still amissing, and that the sheep left on Entrance Island had improved in condition. On the 29th May we left

the ship to commence our survey work in the interior, and arrived at our proposed camping-ground in the afternoon. It was about a mile from the river, in very long grass, and by the side of a swamp, evidently a mosquito location. We had no choice, however, and it was not long ere they found us out and commenced their onslaught. We thought that we had hitherto experienced the worst that a mosquito could do in the way of annoyance, but this night proved how much we had deceived ourselves. I could not understand at first how our mosquito nets were so ineffective, but at daybreak the mystery was solved, as I counted on one square foot of mine 120 of these persevering pests, all poking their long probosces through the meshes; and as one cannot get inside his tent without opening at least three square feet, he evidently takes in with him some hundreds; and as he gets maddened by their attacks and rolls and tumbles about, every motion lets in another legion. A native led us to a place where three of our lost horses were found, and soon after we fell in with a native camp, and saw the inhabitants scampering away, with their children on the women's backs.

One of the ant-hills I measured here was twenty feet high, and from five to six feet diameter at the base, of the same kind as those seen at Cape York and Mountnorris Bay; these were generally formed of reddish earth, rising like towers and spires, and forming a very remarkable feature in the landscape, and were in general found in dry soil; but in a different kind of soil we found flat, wedge-shaped ant-hills, of a dark-gray colour, averaging between six and seven feet high, and six to twelve inches thick at the base, tapering at top to a knife edge of half-an-inch and less, and from eight to twelve feet long, some reaching ten to twelve



feet high. These were invariably found in marshy or swampy ground, so much so that we have frequently had our horses floundering up to their saddlegirths alongside of these ant-hills. The most remarkable feature of their construc-

tion—and it is one which I have not seen noticed—is that they all lie in one direction, their longer axis being parallel, and in most of those observed, that direction deviated little from north to south. This gave the country the appearance of an immense graveyard, with Titanic headstones all looking one way, and which puzzled me a good deal. I could not conceive that magnetism had anything to do with their direction. I then thought the prevailing winds might have something to do with it; but these winds were N.W. and S.E. Latterly it occurred to me, that as it was in the dry season when I saw them—and even then the place where they were was a marsh—in the wet season these marshes would be running rivers, and that therefore these ants would build their houses with the thin edge to the current, in the same way as an engineer builds the piers of a bridge. This theory of the matter also gave a clue to the cause of the great height of these wonderful Babels, to which, if the relative dimensions of the builders of each be compared, the Tower of Babel or the Pyramids of Egypt are as mole-hills—the object, no doubt, being that the

inhabitants might have a safe retreat when the country is flooded.

On the 28th we had scarcely made things comfortable for the night when a roaring, rushing sound was heard coming up the valley. Believing it to be wind, and probably rain, I got up, when presently my mosquito net and everything was blown away, and the rain came down in torrents. The minimum thermometer was at 65° during the night, and I felt very cold.

A native dog visited us several times during the night of the 29th. He was evidently very hungry, as it was found that he had eaten part of a boot which projected from the tent while the wearer was asleep.

Five minutes' immersion in the river, into which the captain's Spencer rifle fell, did not injure its shooting; it went off as usual on trial. On our way back to camp on the 29th we got several times bogged, and on arrival the captain missed his revolver and belt. Before starting in the morning, Tommy, the black boy from Cape York, was amissing, and was still amissing when we returned. He had with him a double-barrel gun, twenty or thirty rounds of

ammunition, and a double-barrel pistol, and with the exception of his shoes was fully clothed when last seen.

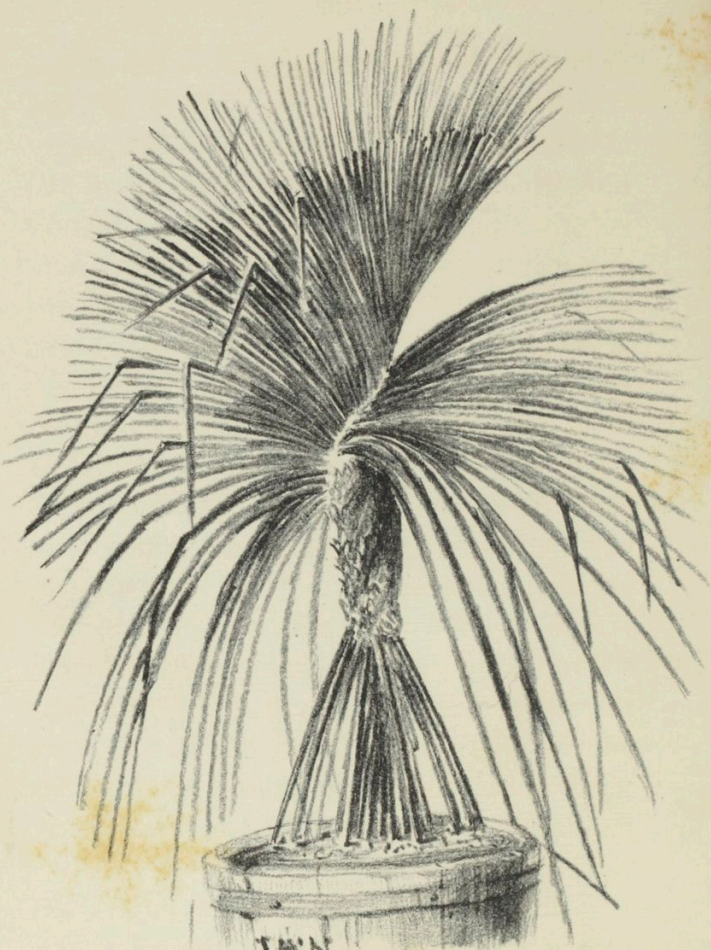
The morning of the 31st was very cold, 58½°. On 4th June we started for the ship, rejoiced that we had not to spend such another night as last among clouds of mosquitoes and swarms of ants. Some black fellows whom we met had caught a yellowish-brown snake about eight feet long, and while it was still living began to eat it. In this camp were about half-a-dozen men, one of them very old and gray-haired, two gins, and nine small children. They all appeared very sickly, and carried about with them the bones of some deceased relatives. We found on getting back to the ship that Tommy had not returned. It was a mystery, as he was treated very kindly by every one, and was a stranger to the natives here, knowing as little of their language as we did.

5th June.—Some of our people are becoming *hors de combat;* a pistol accidentally went off lately, and shot one of the seamen in the leg. The bullet, which the doctor succeeded in extracting, was found to be cut nearly in two where it came in contact with the bone. Our tender arrived

sooner than was expected to-day, with another gun accident on board. One of the sailors had been loading the small cannon, and for shot had used a quantity of the Spencer cartridges. He was in the act of ramming these down, when the percussion, of course, ignited them, and the whole exploded, taking off one of his fingers and greatly injuring the rest of his hand. A number of natives who were looking on were intensely surprised. The ramrod, fortunately, went over their heads. The chief mate stated that he had been from forty-five to fifty miles up a magnificent river, about twenty-five miles to the east of the Liverpool.

6th June.—Tommy was brought on board to-day without clothes, gun, or ammunition. He gave no intelligible account of himself, and was found by the camp where our horses are, on the left bank of the river. He said that he had come down the other side and swam over. The distance is two and a half miles. We cannot account for his action. He was handcuffed and allowed no clothes, and his look was sullen and stupid.

7th June.—Re-shoeing horses and preparing for an expedition to the westward. The pan-



J.H.N

Pandanus. Part of a specimen formerly in Botanic Garden Glasgow

danus tree, which is so abundant in this neighbourhood, has a peculiarity which I had not observed before. The spiral is as frequently right-handed as left-handed, or going in the opposite direction in one tree from that in another; and if two, and only two trees were found together, the spiral of the one was invariably right-handed, while that of the other was left-handed.

8th June.—Tommy was permitted to go on shore with the engineer's party, to the right bank of the river; the sailors had clothed him, and the captain gave him a rifle with twelve rounds of ammunition. When the party returned, Tommy was again amissing; he had suddenly disappeared before leaving the shore to return to the ship, taking his rifle and ammunition with him. Every search was made for him, but with no result, and we feared his fate, as the natives on the right bank were inclined to be hostile.

10th June.—Tommy was found on the left bank of the river this morning; he must have swam two and a half miles, carrying his rifle and ammunition on his head, or have gone a long way up the river and swam there. He

was handcuffed, and not allowed to go on shore.

11th June.—At sunrise Tommy was not to be found, although, an hour before, the captain had spoken to him on deck when he was being handcuffed. A rope hanging over the side indicated the direction he had taken; he had actually gone overboard to swim a distance of one and a half miles in handcuffs, fearless of sharks and alligators. He was seen next evening at the smith's forge, making iron spear heads, and brought on board by the natives, to whom a reward had been offered for his capture. He was very sulky, and put in the forehold with handcuffs.

14th June.—In ferrying our horses to-day from the left to the right bank, to start for exploring the river to the eastward which the chief mate had discovered, our punt upset shortly after leaving the beach. Fortunately the water was not above five feet deep, but one of the horses was drowned, leaving us now with but sixteen, instead of the twenty with which we started. The blacks generally came off at sunset in a canoe, bringing some of their gins with them, when there would be dancing

and singing for an hour or two. On one occasion four gins came off, and we shewed them two dolls—a black and a white one; they seemed immensely tickled with them.

18th June.—The captain and party, eight in all, with twelve horses, started for the river to the east, the mate taking the "Firefly" to meet them there.

20th June.—The zodiacal light was very brilliant and nearly vertical.

21st June.—Entrance Island appeared this morning as if it were in the air, from the great mirage which existed.

22nd June.—About half-past seven this evening an alarm was raised that Tommy had jumped overboard, and was swimming ashore. The boat was being lowered, when Tommy called out "Bo, bo," and was evidently making for the steamer again. We concluded that a shark had seized him, and hastened to his rescue. In a few minutes he was on board, and evidently in great agony, if not shamming pain, which was the belief of all on board, especially when the doctor reported that his pulse was all right, and no bad symptoms that he could see, except froth coming from his

mouth and nostrils; however, in five minutes he was dead. The conclusion was that he had got alarmed and gulped sea water, which had penetrated his lungs; which, on a *post mortem* examination by the doctor next morning, proved to be the case. Thus died poor Tommy, the victim of some incomprehensible hallucination. His companion, Elijah, shewed no inclination to go away, and was always happy and contented.

23rd June.—Two natives from the left bank brought on board the double-barrel gun which Tommy had taken with him on his first escape, with one of the hammers, which was broken off, carefully wrapped in a piece of bark, and three of the cartridges similarly wrapped up. They said that they had got them from some natives on the other bank of the river a considerable distance off, and had a fight for it: thus corroborating Tommy's statement that he had come down that bank, and that the natives there had stolen his gun and clothes. It was loaded with three ball cartridges, without any powder. We rewarded them for their honesty. They told us that they had seen the captain on a "yanaman" (horse) three sleeps off—imitating the motion of the captain jumping a creek, and of

the horses dragging themselves through a bog. In an excursion on shore, in a creek about nine miles west of the Liverpool, I found another specimen of the climbing fern; it had the spores on the back of the leaves.

27th June.—The "Firefly" returned from the eastward without having seen the captain, who had now been out ten days. We became uneasy for his safety, as one of the blacks who came on board the "Firefly" at the new river had the leg of a new pair of moleskin trousers sewn into a bag, which we inferred he could only have got from some of our party. It turned out, however, to be part of the clothes stolen from poor Tommy. They had been unable to find a good entrance into the river, and so had returned.

29th June.—The captain and his party returned; they had found the country very difficult to cross on account of swamps, and had not been able to get through the mangroves to the eastern river—the "Uponga," as one of our black sailors, who knows this part of the coast, calls it. They had lost two of their horses, one of them got drowned in his hobbles by falling down a steep bank to drink.

1st July.—The captain and doctor with some men had started in the whaleboat for a place where bêche-de-mêr were said to be found. They had gone about ten minutes, when I heard the report of a gun and a heavy fall. Rushing on deck, I found that one of our men had accidentally shot himself. He was seen to go aft and touch his rifle, which was lying on the skylight with the muzzle pointing towards him, when it immediately went off. The doctor and captain were signalled for, but Frazer was dead before they returned.

The country through which the Liverpool and its tributaries flows is very flat. The lowest of the tributaries, which we ascended on 2nd June, flows through an immense plain without a tree, except those by the river bank. In ascending it we several times sailed all round the compass. We saw there great quantities of birds, besides cockatoos, large flocks of whistling duck, and a species of black and white duck, as large nearly as good-sized tame ducks, all perching on trees. The rainfall must be prodigious, judging from the number of magnificent water-courses all along the coast. The extensive flats become sub-

merged from six to eight feet, as we observed by the marks on the trees; so that the whole interior is then one vast inland sea, and these channels form the outlets for relieving it.

About six o'clock one evening we had evidently got to a breeding place of the white cockatoo; the trees on each bank were literally covered with them, like a mantle of snow. There must have been at least 50,000 of them, all screeching, and making such a horrible noise that we could not hear each other speak. The tide was flowing strongly up this tributary of the Liverpool, at a distance of thirty miles from its junction. To our surprise and delight, although we had anchored one evening among the mangroves, and had not come prepared for a night on the river, there were no mosquitoes, or rather there were fewer than on board the "Eagle," lying upwards of a mile from shore at the mouth of it. It was high water at our night's anchorage four hours later than at the mouth, shewing the tortuous nature of the channel, which, where we lay, was thirty to thirty-five yards wide, and three and a half fathoms deep; the fall was nine feet. We

were therefore still some distance from the head of the Navigation.

3rd July.—This morning, as we still ascended the river, and the snags became too numerous for the "Firefly," we took to the whaleboat, and got to a point forty-three miles from the junction, and, had time permitted, might have gone farther. The river here was fifteen yards wide and two fathoms deep.

5th July.—The captain and a party of four men start on an expedition to the west, to look for a large river which our black sailor Corbilly says lies in that direction.

8th July.—Hawks are as expert here as at home in catching their prey. We saw one of them descend and carry off one of the black and white ducks.

9th July.—The captain returned, and having gone beyond Junction Bay, proved that there was no river there of any importance.

11th July.—We started in the "Eagle" for the eastward, but owing to a leak in the condenser of the engine, the foulness of the ship's bottom, and burning wood for fuel, our speed was very slow. At two A.M. I went on shore to have a moonlight walk on Haul Round

Island, off which we had anchored. It abounds in sea birds. The shallowness of the sea, caused no doubt by the deposit of sand and debris brought down by the large river in the bight, a few miles west of Cape Stewart, prevented our getting nearer the coast than three miles. At low water the depth so far from shore was only two and a quarter fathoms.

13th July. — Having anchored at Sandy Island, near Cape Stewart, and examined the coast in the "Firefly," without seeing any river, we started about five P.M. to return to the Liverpool, to clean ship's bottom and alter the boiler furnaces for burning wood. About half-past ten we were suddenly brought up by running on a reef. Entrance Island had been mistaken for Haul Round Island, and we had got on a spot that runs out four miles from Skirmish Point. It was blowing fresh, with a considerable swell, but fortunately it was low water. Nevertheless, we kept bumping on the rocks till near high water, when we got off, and arrived next day at our old anchorage at the mouth of the Liverpool River. The barnacles on the ship's bottom were found in some places to be two inches thick.

17th July.—Two of the blacks made their appearance on board, bringing the lost double-barrel pistol which poor Tommy had, but both hammers had been broken off.

18th July.—At nine A.M. we bade farewell to the Liverpool River for a season, our speed being much improved. The flood-tide about two miles west of Cape Stewart flows to the eastward. We were now off a coast hitherto unvisited by Europeans. Innumerable islands were in sight, which we tried to approach; but as the water shoaled from five fathoms to two and a quarter, we had to retreat; and as there was every appearance of a river debouching inside the islands, we came to anchor in five fathoms water, four miles east of Cape Stewart. The ebb tide was running W.N.W. The captain and mate went in two boats to examine the coast, and had gone round inside some of the islands, where there was five and six fathoms water, but not above six or seven feet anywhere across the bar, and were still of opinion that they were at the mouth of a large river.

19th July.—They started again in the "Firefly" and whaleboat for a longer absence, while two men and I accompanied them a short dis-

tance in the dingy, intending to go round the first island and back to the ship; but we found ourselves in a labyrinth of mangroves, the island much larger than we imagined, and steep-sided sandbanks, some of them four feet out of water. On the top of one of these, not thirty yards off, lay a huge alligator basking in the sun. We had gone farther than we intended, and were returning along a passage between two islands, when we were startled by the incessant screeching of some animal on the island on our left, which would be about three quarters of a mile off. The island, which was thickly wooded, was black with thousands of flying foxes, all apparently fighting for standing or rather for hanging room. The tops of the trees were nearly all leafless. These animals live on fruit in New South Wales, but there was none here for them. Their food now might be the young shoots of the mangrove.

20th July.—I started again in the dingy with a fireman and two sailors, to sound to the eastward, and see if there was a navigable passage between the Crocodile Islands and the mainland, or between any of the islands. We got within two miles of one of the Crocodiles,

which was twelve miles to the east of our anchorage, and found no bottom at low water with seven fathoms of line, when I decided to return to the ship, the masts of which were nearly out of sight. It was a dead calm, with the tide against us. A fall of one-tenth of an inch of the barometer in half an hour alarmed me, although there was not a cloud in the sky nor a ripple on the sea. We made all the haste we could to get back to the ship, and had not been on board an hour, when the storm which the fall indicated began to blow furiously from the S.E. We passed several turtles on our way, and were followed out and back by a shark.

22nd July.—The captain returned unsuccessful in his attempt to find any river. Steam was got up, and we started off N.E. to go round the Crocodiles, the captain not liking to risk the ship inshore. We were going along at the rate of seven or eight knots, with a strong S.E. breeze blowing, when suddenly we ran on a reef. After three hours' bumping we passed over it without much damage. It was near high water at the time, otherwise the accident might have been serious, as the wind was freshening. By noon we had passed the

most northerly of the Crocodiles. As it was blowing half a gale, we tacked to get into more shelter of the land, but it was only when we had cleared the most easterly of the Crocodiles and their reefs that we felt less anxious, knowing that every hour was taking us farther from danger.

We had a birth on board to-day. While at Liverpool River some of the men had found a nest of emeu's eggs, one of which had been put away by the mate in a drawer. On looking this morning into his drawer he found a little emeu walking about in it; his egg had been hatched during the night.

23rd July.—Unfortunately the little emeu is dead; the rats have killed it. We anchored this afternoon in Castlereagh Bay, near the place we were three months before. Four natives put off in their canoe, a Malay one, and came within talking distance. They had probably never seen a white man before. When the captain and doctor went on shore, the natives at first were frightened and ran away, but soon came back, and the whole tribe followed them.

24th July.—The natives have evidently frequent communication with the Malays, many of their words and customs being the same.

Their canoes they call proahs, their poles are cut with Malay tomahawks. They make very hard bargains; for a parcel of tortoise-shell which they wished to sell, nothing less than a tomahawk would satisfy them. Here we saw a framework erection, five to six feet high, on which they sleep, with a fire underneath for the purpose of driving off the mosquitoes, yet these insects are not nearly so troublesome here as at Liverpool River. On inquiring for fresh water, the natives directed us to a spot on the beach, about halfway between high and low water, where by digging in the sand with the hand we got plenty, and, singularly enough, a yard or two above or below the spot the water was quite salt; but at this point, although there was no indication on the surface, by digging below there was a very abundant supply of the purest fresh water, even when the tide had ebbed to the spot, and the waves were washing up to the hole. We watered the ship regularly from this place while she lay here.

About 200 yards from the beach, among tall trees, and almost hidden by the foliage from the sun, I fell upon an immense mound of earth,

which I at first thought was made by human hands; afterwards I thought that it must be an ant's nest, but its enormous dimensions made this doubtful. The doctor said that it was a turkey's nest. It is dome-shaped, fifteen feet high, and fifty-six paces round the base, with a hollow on the top of about five feet diameter. Only think of the nest of a bird with 500 loads of earth on it; it must be the work of ages, from the great trees of half a century's growth growing out of it. Gould says of the wattled talegalla, or brush turkey—"The most remarkable circumstance connected with the economy of this bird is the fact of its not hatching its eggs by incubation. The means resorted to for effecting this object, although in some degree assimilating to the practice of the ostrich, is yet upon a totally different principle. The wattled talegalla collects together an immense heap of decaying vegetable matter as a depository for the eggs, and trusts to the heat engendered by the process of decomposition for the development of the young. The heap employed for this purpose is collected by the birds during several weeks previous to the period of laying. It

varies in size from two to four cartloads, and is of a perfectly pyramidal form. The construction of the mound is not the work of one pair of birds, but is effected by the united labours of several. The same site appears to me, from the great size and entire decomposition of the lower part, to be resorted to for several years in succession, the birds adding a fresh supply of material on each occasion previous to laying. The mode in which the materials composing these mounds are accumulated is equally singular, the bird never using its bill, but always grasping a quantity in its foot, throwing it backwards to one common centre, and thus clearing the surface of the ground for a considerable distance so completely, that scarcely a leaf or blade of grass is left. The heap being accumulated, and time allowed for a sufficient heat to be generated, the eggs are deposited not side by side, as is ordinarily the case, but planted at the distance of nine to twelve inches from each other, and buried at nearly an arm's depth, perfectly upright, with the large end upwards. The eggs are said to be delicious eating, and are eagerly sought after."

Brush Turkey

JHN
from Gould
Wattled Talegalla

The tide runs from two to three miles an hour, with a rise and fall of twelve to fifteen feet or more, but appears to be very irregular.

25th July.—While surveying on the north point, opposite to where the "Eagle" was lying, we found a tide of four to five knots running between and past the rocks, and discovered that we were in a strait at least ten miles long.

26th July.—I started to-day in the whale-boat, with four men, for a two or three days' cruise, to examine and survey the channel we had found yesterday. Both banks were covered with mangroves, so that it was very difficult to make an accurate survey. Great sandbanks extended a long way out from shore. At the narrowest part it is about half a mile broad, with a current running like a sluice, at the rate of upwards of five miles an hour, with a depth there varying from ten to twelve fathoms. On the banks we found a small species of palm tree, from six to ten feet high, with a bunch of green fruit, about 150 in number, of the size of walnuts. The Malays visit the strait, as the remains of their fire-places for preparing bêche-de-mêr were visible in several places; and in the middle of the

channel, towards the north end, we found two stakes, painted white on the top, evidently their guide-marks. We could not get any fresh water; and after going about thirty miles, to within four miles of an island in mid channel, and discovering that there was a passage apparently to the north and another to the south-east, we returned to the ship. While sailing along the shore, a mullet of about three pounds weight jumped on board. It was an unexpected treat for supper, which we enjoyed amazingly. Turtles and sharks were plentiful. Near the Malay stakes one of the sharks got hold of the stroke oar, and nearly threw the man overboard.

In our survey to the west of our anchorage in Castlereagh Bay, I landed on a point which I had seen from the whaleboat when searching for a passage to the eastward between the mainland and the Crocodiles; but we found now long lines of breakers in every direction, as far as the eye could reach, so that it would be extremely dangerous for any vessel to attempt a passage until it was properly surveyed and buoyed. The tide was running at the rate of nearly five miles an hour past the point.

On returning to the ship I observed a schooner to the north of us, about four or five miles, making to the S.W., right into the jaws of the Crocodiles, and suddenly, as if noticing her danger, to put about to the north. She had not been observed from the "Eagle;" we surmised that she was in search of us, as our position was so far out of the track of vessels. I found some fine specimens of the climbing fern, with their fronds full of seed. They were climbing ten and twelve feet up the trees.

6th August.—We started to go to the eastward through the new channel we had discovered, but when we reached the narrows, the tide had turned, and we could not stem it, and anchored in ten fathoms; an hour afterwards our anchor dragged, and we went swinging away with the tide about five miles an hour, till our anchor caught on a ledge of rock, and in bringing us up nearly tore the windlass bits out.

7th August.—Having anchored the previous night a few miles past the narrows, and got aground soon after starting again, we waited for the tide to rise, and after passing four islands on our right, we anchored at dark in a bay, which proved to be in South Wessel

Island. We were in Brown's Strait. The ebb tide runs in the opposite direction to what it did in the first part of the channel through which we came, and with equal velocity, so that the two tides must meet somewhere about these islands, causing the great currents and conflicting tides which have been so puzzling to me all along. The latitude of our anchorage was 11° 45′.

8th August.—We started N.E., to find a passage to the eastward. The narrow passage separating the south from the middle Wessel we did not attempt, but made for Cumberland Strait; but here the current was so strong, that the whaleboat, with the mate and six men which the captain sent to examine it, was nearly swamped; it was suddenly dragged into the midst of the breakers, at the rate of seven or eight miles an hour, against the efforts of the rowers pulling for their lives. Several seas came over the boat. Fortunately, they were saved—their strong pulling taking them into an eddy towards the shore, and out of the strong current. We were glad to get them on board again. As the captain feared that our tender, the "Firefly," which was always towed

astern, would break adrift in such a current, he with great reluctance determined to return and go through one of the passages to the south.

9th August.—We anchored last night at what I take to be Cumberland Island, and discovered before starting this morning some canoes and natives ashore. They gave our mate some tortoise-shells, and shewed him where there was some beautiful fresh water. I observed here a creeping plant among the rocks with a stem twenty to thirty yards long, and from an eighth to a fourth of an inch diameter, without a leaf or branch till the very end, where there were a few small leaves. There were also several plants with thick succulent leaves full of white milky juice. We passed through a strait south of Cunningham Island, which we call now the Eagle Channel, from our own expedition being the first to pass through it. The S.E. headlands and points of the Wessel Islands are bold and precipitous, one of them being quite perpendicular, and apparently 200 feet high, shewing that the prevailing winds and seas are from the S.E.

12th August.—About noon, in Limmen's Bight, we were surprised to see a canoe ahead

of us, about one and a half miles from shore, with two natives in it. They had a fine turtle on board, weighing fully two hundredweights, which we bought for a tomahawk, some tobacco, and bread. It came very opportunely, as we had been short of fresh provisions for many days. The water in the bight is very shallow, even at six miles from shore; we had in one place only two fathoms and the coast very low, nothing visible higher than the coast trees. We were making for Maria Island, where we intended to land our horses, when, about seven P.M., we ran aground on a sandbank, and stopped so suddenly that our tender ran into our stern, and was so damaged by the propeller that, after hurriedly removing all that was valuable, we allowed her to sink, to the delight of all on board, as she had been a great hindrance to us, and a nuisance ever since we left Sydney.

13th August.—At Maria Island, while the captain was landing the horses, the mate and I went with the whaleboat to try to find the entrance of the Roper River, which Leichardt had fallen in with about thirty miles from the coast. He describes it as a fine river,

from 500 to 800 yards wide. We went in a direction about west from the vessel, as the coast had been examined by the "Beatrice" nearly up to that point from the south. When about a mile from the beach, and making for an apparent opening a little to the south, we had only six feet of water, which gradually shallowed to three feet, two feet, and one and a half feet. We were evidently passing over a bar, and soon found ourselves in a river with a strong tide running up, but it looked too small for the Roper. It was about 400 yards wide, with a depth of two to three fathoms. The country was much more open than on many of the rivers to the north, and with fewer mangroves. Five or six miles up it was reduced to from 200 to 300 yards in width. We camped for the night about sixteen miles up. High tides from the gulf evidently flood the plains, as they were covered with sea-shells. Almost the only plant growing on the sandy plains was the *Saliconnia*, which appeared very common. Latitude of our tent about 14° 51′.

14th August.—The tides are very uncertain and unaccountable. It was ebb tide when we entered the river at half-past one P.M.; it was

still ebb when we camped at six P.M., and there was no flood till about midnight; then it was high water about half-past five A.M. At fifteen miles up, and where the water was still as salt as the sea, we came to a ledge of rocks and gravel, with the fresh water running over it. The river was here only twenty yards wide. There were no mangroves, which was a refreshing change from the ever present mangrove of the northern rivers. We had gone following the windings of the river about fifty miles, or about twenty-seven miles in a west-south-west course. If Leichardt's longitude was correct, he must have crossed the Roper halfway between us and the sea; but we inferred that he was fifteen miles wrong, and that the Roper was some miles to the north of the river we were in. While passing down the right bank we were hailed by a native from the left bank, who on our waving to him came over the shallow water to us, which we thought singular, seeing that as far as was known no white man had been on the river before. He commenced to tell us, as far as I could make out by his signs, that some one, of course a white man, had been there, or was among them

then; that he had come from the south, had slept there, and went to sea to spear turtle, and that there was only one. This was a point on which he was very decided. He did not appear to know the use of some tobacco which we gave him. We observed some marks on the trees as if made by surveyors; one was like an H. I wished much that we could have gone up higher, when we might have fallen in with more decided marks of Leichardt's track. On our return to the bar it was dark and low water, and though we searched for an hour north and south, could not find eighteen inches of water over it, so we returned and camped on the sandy beach till daylight.

16th August.—Shortly after starting for the ship, it began to blow very hard, and we had a very heavy pull to get back. We had canvas set, but had soon to take it down owing to the heavy sea running, and shipping so much water. The surf was too heavy for us to return and land where we had started from, the ship was fifteen miles off, and our nearest shelter was thirty or forty miles off. We resolved never again to run so much risk by going so far from the ship.

Tasman, who named so many lands and rivers after his lady love—Maria Van Diemen —named the land on which we were leaving our horses, Maria Island. It is about five and a half miles long by four broad.

19th August.—On our way south, and when 200 miles to windward of the nearest land, a flying fox or large bat appeared close to the steamer, trying to come up to it against the wind. After a long time it succeeded in reaching the mainmast quite exhausted. He was about nine inches long in the body, and about two feet over the wings, with a sharp nose like a fox, and large eyes.

22nd August.—Sweer's Island, at which we anchored, is the seaport of Bourke Town, on the Albert River. The coast is so low at the mouth of the river, that the first objects seen on approaching it are the mangroves, and the water is so shallow that at five miles from shore it was only three fathoms deep. On the west side of the island is Flinder's Fig-Tree, on which are cut in large letters up the stem,

"INVESTIGATOR, 1802."

Stokes and the other explorers who visited

the island about twenty years ago have added their names. It appeared to me that these latter names looked as old as those cut by Flinders sixty-four years ago. The tree is about twenty feet high, and not eighteen inches diameter, and some of the letters are seven or eight inches long, so that it must have grown very little since the beginning of the century. The mornings are sometimes so cold that one morning lately, as Mr. Landsborough informed me, he had drawn water from a creek at a temperature of 46°.

23rd August.—We started for the Albert River, and after discovering the entrance went up in the whaleboat. It is much narrower and shallower, and the distance to Bourke Town much greater than is represented on Stoke's chart. It was near low water, and during the last fifteen miles before arriving at Bourke Town, we got aground five or six times on banks with less than twelve inches of water on them. In some places we had to get out and drag our boat for 100 yards and more over the shallows, then we "blowed" Stokes for his magnificent River. The country round Bourke Town is as flat as

the sea, and apparently there is little else to be seen but interminable plains of dry grass. But dry as it is, cattle, sheep, and horses thrive uncommonly on it. There has been little or no rain for the last five months. The climate is admirably adapted for curing meat, being so dry that little salt is needed, and there are no blow-flies. The half of what we are being supplied with is to be jerked or sun-dried. There is two hours of difference between the time of high water at the bar and at Bourke Town, about forty miles up by the windings of the river, and at the town the current runs up about two hours after high water. In general there is only one tide in twenty-four hours, but sometimes there are two in the same time. It is often high water when low water is expected. During my visit the rise of tide at Bourke Town was about four feet; but during the N.W. monsoons I was told that it was much greater. The same cause would affect the Roper, or the river we ascended off Maria Island, and explain the high tide marks which we saw, and Leichardt's rise of three feet where he crossed the Roper.

28th August.—About noon to-day the ther-

mometer in the shade stood at 89°, and the wet bulb at 69°, shewing that the temperature would require to be reduced to below 50° before dew would be deposited. The mornings are often cool, and sometimes cold. One of the residents told me that the water in his bath one morning lately was 45°. Some Chinese had established a garden, which looked like an oasis for its greenness. Their cauliflowers were one shilling each, and lettuces sixpence each. I greatly prefer the long podded bean which they grow to the French bean. The Chinese cucumber, with its longitudinally ribbed, wing-like projections, is smaller than ours, and is eaten with sugar and vinegar. In the space of 100 miles along the south coast of the Gulf of Carpentaria there are nearly as many rivers of considerable magnitude as there are on the whole coast of New South Wales. The Norman in the S.E. corner is navigable for small vessels for forty miles, and will probably soon be more important than the Albert.

1st September.—To-day I witnessed the wonderful illusion caused by the mirage, as seen by travellers in the deserts. I was walking down the river to embark in the Sweer's

Island steamer, waiting for us about twelve miles below, when I saw before me some beautiful lakes, with islands covered with trees. On looking behind I found that I had passed through them without wetting my feet.

3rd September.—We started to embark our horses at Maria Island and return to the north coast. The horses we found were nearly dead for want of water; they had been travelling all over the beach drinking the sea water. After finding water for them we dug wells, and left them to recruit for a few days.

9th September.—The mate and I took a boat each to explore more thoroughly the river we had been up before. After examining different branches, and arriving at the head of the salt water, the mate had his boat taken up over the rocks and into the fresh water reach above, but could only get about four miles farther; so we concluded that this was not the Roper, and returned. From one of our camping grounds we saw the north high land of Maria Island bearing E.7°N.

14th September.—We got under weigh for the north; but seeing what appeared to be an opening to a large river, the captain and I

went in the boats to examine it, and we soon entered the estuary of a noble river. It was a mile wide, with four and five fathoms water; and at ten miles up it was 800 yards wide, so we had no doubt that we had at last got into the Roper. It was certainly a magnificent river, the finest I had seen in Australia. The alligators here are larger, bolder, and more numerous than in any of the rivers we have been in, and shew more of their tails while swimming. At the highest point to which we ascended the tides were regular, two in twenty-four hours, and the river from 500 to 700 yards wide, without a sandbank or snag. Had we gone on for a few hours longer, we should have reached the place where Leichardt encountered it, and might probably have seen some records of his visit. As it was, the captain desired to return. The mosquitoes were so troublesome, that rather than camp among them for another night, we continued our course down stream till one A.M., when we camped for a few hours on a sandy flat, and started again at daylight; and soon after arriving on board the "Eagle," about a quarter past four A.M., started for the north.

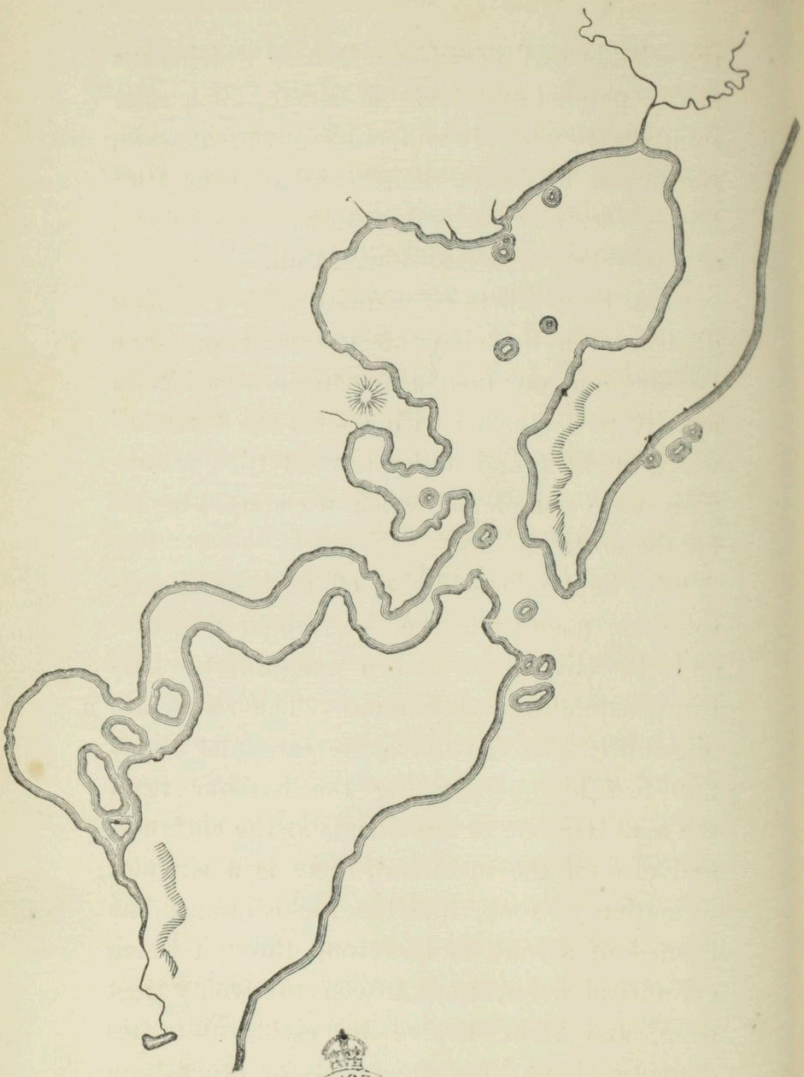
18th September.—On going north the mate and I were sent to examine another inlet which looked like a river. It turned out to be an island, the passage, about a mile broad between it and the mainland, being nearly dry at low water. The captain named it Edwards Isle, after his friend Captain Edwards, whom he met at Bourke Town. It was densely inhabited by flying foxes. We ascended two small rivers, which we discovered.

20th September.—The coral reefs were becoming more numerous as we sailed along the shore, and many beautiful specimens were sailed over; but while rounding a point we got entangled among some of them, and our boat was so damaged, that we had to return to the ship for repairs. Some natives we saw brought us a basket of turtle eggs, and went to their usual water hole on the beach to supply us with fresh water. We were looking for a good place at which to wood and water the "Eagle," as the water on the west side of Bickerton Island, where the ship was lying, was very bad. Flinders doubted if there was a passage between Bickerton and the main, but we found a depth of eight fathoms in it. There is a

remarkable reef near Cape Barrow which runs nearly parallel and level for about half a mile from the beach. It is about twelve feet wide, and dry at half tide. The coast in Blue Mud Bay is very incorrectly laid down by Flinders, or, rather, it is not laid down at all.

26th September.—The mate and I having discovered a fine bay on the west of Cape Barrow, and our men a fine freshwater lagoon near it well stocked with ducks, the "Eagle" was brought round and anchored till our supplies were completed, when we started again for the north.

29th September.—Being off an inlet of considerable magnitude, we determined to go in, and thereby discovered a magnificent harbour, extending many miles. The rocks are ofgranite. To the north are sandhills about 200 feet high, separating the harbour from the sea. On one of the islands at the entrance, and also on the mainland, there is a singular formation of rock, like basaltic columns, but formed of a kind of limestone, through which cylindrical holes, from fifteen to twenty feet deep, and from twelve to eighteen inches diameter, have by some means or other been



formed. Many large fragments have tumbled down by the undermining of the sea. The perforations of some of the fallen masses pass entirely through them, and are almost perfectly parallel. These limestone rocks are the foundation of the sandhills.

The parrot fish is very plentiful here. They are of a bright green colour, about eighteen inches long. I was particularly struck with the rhythmical regularity of their motions. A shoal of some fifty or sixty of them were making a course across the bay, and at regular intervals they all leapt out of the water together, and descended together almost at the same instant, and this they continued for a considerable time. On a small, fantastic-looking island, in the centre of the harbour, and conspicuous from all parts of it, we found several large tamarind trees, loaded with ripe fruit, and the most complete Malay establishment for preparing bêche-de-mêr that we had yet seen, with many pieces of bamboo of all sizes, used for drinking vessels and for water carriers, with remains of pottery, sleeping apartments, and two large fishing nets. This bay evidently forms their headquarters. From the

highest hill in the neighbourhood, 260 feet by the aneroid, I had a magnificent view of the whole harbour, the sea, and outlying islands. There being no mosquitoes, and the night fine, I determined to camp out. We set fire to the bush all round, and had a glorious fire and magnificent illumination, especially when the pandani took fire, the flame burning up to their many branched tops, looking like so many huge candelabras.

1st October.—The natives kept out of our way, although we saw their fires. After proceeding seven or eight miles up one of the creeks, resembling much a Highland loch, it diminished to a river, which we ascended for a mile or two, when hearing the welcome sound of running water close at hand, we discovered it and stopped to boil our kettle, and at its clear stream of beautiful water proceeded to fill our water casks. But one of our people, before our kettle was half-boiled, inadvertently set fire to the bush, which quickly communicated with the palms and pandani, and spread and raged so rapidly that we had to make a precipitate retreat in order to save our boat from being destroyed.

Pandanus. Botanic Garden Edinburgh

3rd October.—Got up steam and under weigh for the north, anchoring for the night off Melville Island, north of Cape Arnheim.

5th October.—Owing to the sudden shallowing of the water towards dusk last night, and the strong tide running, we put about and anchored on the west side of Inglis Island, and this morning crossed Arnheim Bay to explore a deep inlet running to the S.W., which Flinders put down as a possible strait. It was from eight to twelve miles wide, which width it maintained till we had gone up about twenty-four miles, and found the bottom of it.*

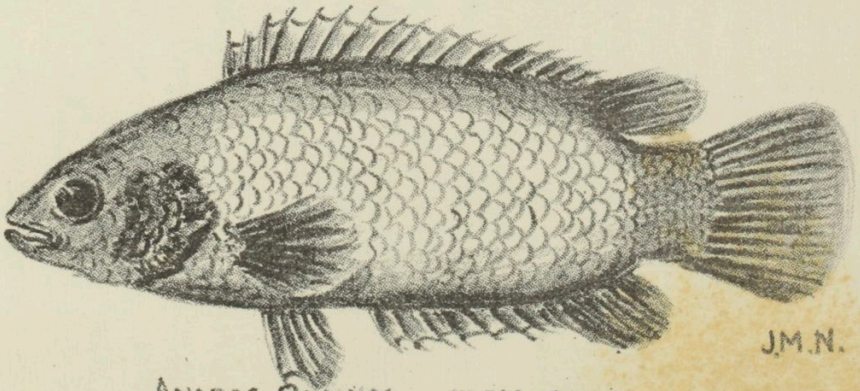
8th October.—On the 6th and 7th, as we were anxious to get a supply of fresh water, we explored a river coming from the south at the bottom of the bay near where the "Eagle" was anchored, but found no fresh water. To-day we started in the whaleboat for a much finer one a little to the westward. It was from 600 to 800 yards wide for about twelve miles up, but we could find no appearance of fresh water as far up as we went. Seeing some pandani at the foot of a rising ground, I thought that there might be water there, but everything was dried

* Buckingham Bay.

up, although the place was evidently a swamp for the greater part of the year. After sunset counting upwards of 500 native companions flying overhead from the direction in which I had previously heard the noises of birds, I concluded to search there in the morning, as these birds are generally found in freshwater lagoons.

9th October. — We found the native companions this morning about two miles from our camp, pirouetting in hundreds, but all was now dry. Our black boy Elijah, however, found some water for us about three miles farther in the bush by digging in the sandy bed of a dry creek. His cooey soon attracted us to the spot.

There were, as usual, alligators, and rather large ones, in this river; also the climbing perch, which is common in all the rivers of the north coast. They are about a foot long, and climb up the trees which grow out of the water. They cannot go up vertical stems, but waddle up branches inclined to the horizon at considerable speed; and it must be confessed that the sight of a fish up a tree is rather comical, but it is common enough on the north



J.M.N.

ANABAS SENNAL FROM CUVIER.
THE CLIMBING PERCH OF CEYLON.

coast, where consequently the phrase "a fish out of water" cannot be employed to signify something out of its element. They often run along the mud, and bury themselves in holes in the banks. Sir Emerson Tennant describes the same fish, I think, as an inhabitant of Ceylon. If he were here he would not doubt the fact of their ability to climb trees, as I saw them both going up and down. There were also the seven-gun brigs, a small fish with seven black spots on each side; also a species of very pretty guard fish.

12th October.—After having explored another branch of the same river, we started for the Liverpool River. At three P.M. the temperature of the sea was 86° and of the air 85°; during the last two days there was occasional thunder, which we took to be the first indication of the change of the monsoon. In the evening we anchored close to the beach in a bay on the north shore, and at low water found ourselves aground in three feet of water, with a dry coral reef close under our stern.

13th October.—We found water close to the beach, and in a hollow of a rock almost the complete skeletons of two human bodies wrapped

in bark. The skulls were 3-16th inches thick. Numbers of Torres Straits pigeons were flying about.

14th October.—Under weigh and pass into Cadell Strait, between one of the islands I had previously discovered there, and the mainland. The water during the passage suddenly shallowed from ten fathoms to one and three-quarters; but as it as suddenly increased we got through with a slight touch on the ground. We then went north through Brown's Strait, and from Point Dale our course was directed to clear the Crocodile Islands.

15th October.—At our old anchorage at the mouth of the Liverpool River. The sea is nearly 10° hotter than when we were here before, and the rise and fall of the tide much greater, in consequence, perhaps, of the sun and moon being more nearly vertical. The mosquitoes have all gone off. I could now land with pleasure and go into the bush. Everything is beginning to look green from the recent rains.

24th October.—As our stores are becoming exhausted, we start for Mountnorris Bay, and anchor for the night near South Goulborn. On landing next day on the mainland in Macquarrie

Strait, no fresh water was to be found where King's ship watered. It was the beginning of the dry season when he was here, and fresh water, no doubt, plentiful, whereas it is now the end of it, and none to be had. King's crew were attacked by the natives with stones thrown from the tops of the high cliffs. There were none to be seen during our short stay.

28th October.—Mountnorris Bay. The buffaloes, which were so numerous when we were here before, had all left, and we could only get about twenty gallons of water out of a hole where the last rains had left it, so we got under weigh for the westward, and on the 31st October anchored in Adam's Bay, off the township. The houses, fifteen or sixteen in number, outbuildings and fences, appear not to have been disturbed since they were abandoned. We were very anxious to visit the "Deserted Village," and see actually what had been left. While going ashore, we were sailing over coral of the most delicate and fragile structure. Looking up to the town we saw the flag hoisted on the staff of what used to be the superintendent's house, from which we knew that Myra, the old chief, was at home; but he had hoisted the Union Jack

half-mast and upside down, which would have been rather ominous if we had thought that he knew the usages of civilisation; as it was, we took it as a token of rejoicing at our arrival. As we neared the beach twenty to thirty natives came rushing into the water to meet us, with old Myra at their head, with a large felt hat on, and carrying a red flag. We proceeded in a body to the town on the top of the cliffs; the recent rains had made the country look beautiful. On the beach the horse boat or ferry punt was lying perfectly sound. It had cost about £800 in Adelaide. There were also iron water tanks, wooden casks and vats, never moved nor a hoop taken off. We were surprised at such self-denial on the part of the blacks, but on getting into the town our astonishment was greater. We found everything as it had been left—not a window broken, nor table nor chair moved; not a bottle or paper disturbed. There they were as they had been left, the remains of books, papers, memoranda (many of these the owners would rather they had not been so carefully preserved), bottles without number, inkstands, a fine plough, never used, waggons, harness, &c., &c. The very gardens

had been left untouched; the vegetables and fruit had been left to wither and rot on the trees, rather than that anything should be injured. We plucked some fine bunches of bananas and three or four pine apples. Several cocoanut trees were thriving well, also cassava trees and cotton plants. The "Julia" cutter was lying sunk in the creek where she had been left, and perfectly sound, with all her gear about her. The captain and I went a little way into the bush, accompanied by two or three of the young natives, when to our surprise they struck up in excellent time and tune "John Brown" and several other airs of similar stamp. We were almost convulsed with laughter.

1st November.—After presenting Myra with a shirt, a pair of trousers, a sword and belt, we got under weigh for the Victoria River, anchoring in the evening near Quail Island. Towards midnight our position became very awkward, as we were then bumping on the bottom with an extensive reef lying close astern, and a black squall with thunder and rain coming up from the S.E. We had anchored in five fathoms water, but the bottom must have been very irregular. After four hours'

bumping we floated sufficiently to swing clear of the reef.

4th November.—The weather had been very close and hot till three P.M. with the wind at N.E., when a squall, with thunder and rain, came from the S.E., lasting half-an-hour. The temperature before the squall commenced was 92°, and immediately after it passed it was 87°. In the evening we anchored in lat. 14° 8′, between Cape Hay and Point Pearce, near the northern headland of the entrance of Victoria River.

5th November.—We anchored between the sandheads, carrying ten to twelve fathoms all through where the charts shew only five, six, and seven. The depth of the river generally for about fifty miles up is from fifteen to twenty fathoms; but in that distance there is not a square mile of the bank fit for cultivation, nothing but barren, rocky, steep, water forsaken hills, with a vertical sun making the rocks almost red hot. Yet this is the place to which we have come for wood and water, and with not a day's consumption of either on board.

7th November.—The men have been ashore cutting wood, but could find no fresh water

anywhere. The maximum temperature during the day was 95°. At half past ten P.M. it was 86½°.

8th November.—Very hot. The men have been cutting wood. The temperature of the afternoon varied from 98° at three P.M. to 87° at ten P.M.

9th November.—The captain returned last night from his search up the river for the wells which the "Beagle's" people had dug, but could find neither wells nor water; and as our water on board was exhausted, we had now to commence condensing the steam from the sea water.

I observed some gouty stem trees here, with stems swelled out like a bottle, about five feet from the ground. One was thirty to thirty-five feet high, and about fourteen feet in circumference. The stem, with the exception of the bark, which is one and a half inches thick, consists of a white, very juicy pith, which can be cut out in large masses. The watery juice forms an agreeable drink, slightly resembling cocoanut in taste, and which, in a country so destitute of fresh water as this is, is not to be despised. Its botanical name I do

not know. I think it has not been seen out of its native habitat. Some seeds which I gave to the director of the botanic garden on my return to Sydney failed. The spring tides rise twenty-five to thirty feet, and run at the rate of four to five miles an hour. Through some of the reaches the tide rushes at such a rapid rate as to cause a bore, the rumbling sound of which we heard for miles.

12th November.—Last night was warm, and at sunrise this morning it was 84½°. Having now got as much wood on board as we thought would last for five days' steaming, it was determined to start for Timor. The men are all knocked up, and willing to run any risks at sea without steam power rather than remain longer in this miserable place.

13th November.—Pass the Sand Heads *en route* for Timor.

15th November.—Latitude at noon 11° 38′, longitude 127° 48′. At nine P.M. we are about 145 miles from the coast of Timor, and about equally distant from Melville Island and Point Londonderry. At sunset the high mountains of Timor, which are said to be visible at a distance of ninety miles, were distinguished about

The Gouty Stem Tree from a Picture by Baines. Bennett's Setberry
Adansonia Gregorii

forty miles off through the haze. We had been looking out for them since noon, and were beginning to feel anxious, as it was now evident that with all the fuel we had left, barely enough for twenty-four hours' steaming, we could not reach Timor without a favourable wind, and hitherto there had either been no wind or westerly.

17th November.—This morning we were about twenty miles from the coast, with a magnificent range of mountains in view. At seven P.M. we were lying becalmed about three miles off a bluff point, with no bottom at seventy fathoms. It was a very anxious day for us, as our food and water were nearly exhausted, and we had barely fuel enough to take us to land, and uncertain also both as to our being able to find a landing place and get timber when landed. Had a wind from the west sprung up we would have been blown out to sea; but a light land breeze in the evening and a strong favourable current relieved us considerably, by taking us nearer civilisation and assistance.

18th November.—A nice little breeze in our favour brought us thirty miles nearer our destination. At noon we were in latitude

10° 22′, and longitude 124° 20′. The temperature at three P.M. was 89°. Rotti Island, near Koepang, was visible from the masthead at sunset.

19th November.—This morning, as we found ourselves within twenty-five miles of Koepang, and with wood enough to take us in, we got up steam, and arrived at our anchorage about noon, thankful that our troubles were now over.

Mr. Drysdale, of the firm of Messrs. De Sisu and Drysdale, chief merchants here, came on board, and was very kind and attentive during our stay, entering us at the club, and inviting us to his family circle, &c. Mrs. Drysdale is a native of Timor. She was as kind as her husband, and spoke English remarkably well. The game of whist as played here, I prefer to our own method. The dealer does not turn up the last card for trumps, but, on examining his hand, declares what suit will be trumps; or if he has nothing very good, he leaves it to his partner, who must then declare; or if the dealer thinks it better to have no trumps, he says, "Sans atout," or if left to his partner he may do the same. Then the game is played as in ordinary short whist; but the counting is

different. Ten counts an honour, making five honours; if hearts are trumps, each point counts five; if diamonds, four; if clubs, three; if spades, two; if without trumps, every point counts eight; and with regard to honours, three honours count, as with us, two; four honours, four, and five honours, five; and if without trumps, the aces count as honours, and each point in this case counts eight. Thus, if a party have three by cards and two by honours, and hearts are declared trumps, it counts $5 \times 5 = 25$

If diamonds, . . $5 \times 4 = 20$

If clubs, . . . $5 \times 3 = 15$

If spades, . . . $5 \times 2 = 10$

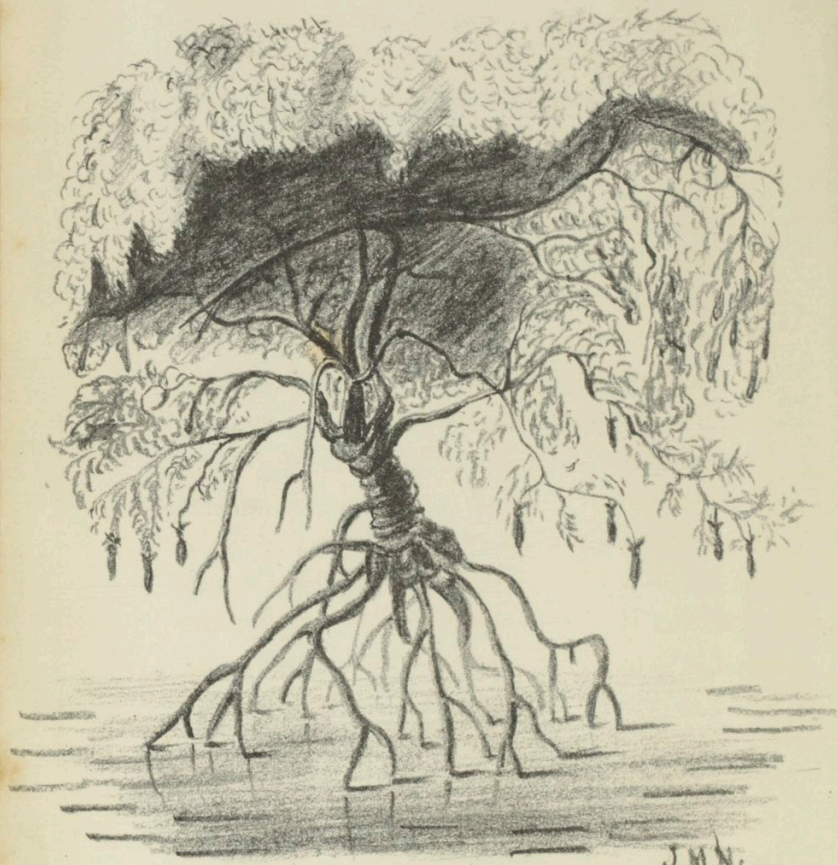
If without trumps, and one party have 2 aces by 3 tricks, it counts $5 \times 8 = 40$

The contrast between the arid, barren, burnt-up soil of the north coast of Australia and Timor was very marked. In the latter, near Koepang, we had clear bubbling running water; tall cocoa trees growing in every direction, loaded with fruit; the magnificent shady fig or banyan trees, mango trees, loaded with their luscious fruit; the fine light green tamarind tree, some of them twelve feet in circumference; the lofty toddy palm, with palm-leaf baskets

attached to their upper leaves, collecting the juice, and the roads lined with other fruit-bearing trees.

In some of the extropical portions of Australia something like tropical vegetation is to be seen; but on the north coast, lying within the tropics, such spots are extremely rare. In the Illawarra district, for instance, forty miles south of Sydney, we find forests that cannot be penetrated without the axe, into which the light of the sun cannot penetrate, composed of noble trees with vast trunks over 200 feet in height; endless species of graceful palms, with stems over 100 feet high; tree ferns, and rope plants festooning the forest from tree to tree.

Dr. Muller has told us of the mighty eucalypti, 420 feet in height, growing on the banks of the Yarra Yarra, near Melbourne. Dr. Hooker and many others have made us acquainted with the gum trees of Tasmania, over fifty feet in circumference; but nothing of the kind is to be seen in tropical Australia west of Carpentaria. The vegetation is mean and stunted in the extreme, seldom rising above the rank of firewood; the prevailing feature of most of the rivers and coast being the man-



Mangrove

grove tree, which grows on the muddy banks of the sea, constantly flooded by the tides; in fact, it appears to grow only in salt water.

The climate of the north coast divides itself naturally into two well-marked seasons, those of the S.E. and N.W. monsoons, the former extending generally from April till November, when the south-easterly or land winds prevail, and consequently with little or no rain. These winds are no doubt caused by the cooling of the extensive arid Australian plains, consequent on the sun's going north. The cold experienced at night in certain seasons of the year in the interior on its treeless plains, even within the tropics, is very great, as is shewn in the journals of different explorers. The consequence is, that from April till September the temperature of the north coast is generally moderated and comparatively pleasant—generally a cooling breeze prevails, with a serene sky. Rain rarely falls during this period.

During the remaining four or five months the moist N.W. wind blows with considerable violence, deluging the country with floods.

The excessive irregularity of temperature of the interior, recorded by Captain Sturt and

others, does not prevail on the north coast, as my observations shew — contrasting marvellously with the excessive high temperatures frequently experienced in localities 20° nearer the south pole. A temperature of 106° in the shade I have experienced in Sydney, and higher is recorded by the Government observer there; and at Melbourne, still farther south, 110° and 112° is frequently recorded. On the Darling River I have been exposed to an unclouded sky for ten hours at a stretch, the thermometer in the shade regularly never less than 95°, and sometimes 115°. In Adelaide the Government astronomer has registered 117° in the shade. All these places are situated near the coast; but in the interior much higher temperatures have been recorded. Captain Sturt, in one of his expeditions, experienced a shade temperature of 131° and 132°.

After leaving Timor, in the early part of December, I kept a daily record of the temperature of the Arafura Sea, and found it in one particular locality, between Timor and Australia, to have the extraordinary temperature of 89°, 90°, and even 91°—so warm that bathing in it was uncomfortable.

NOTES BY MR. W. KEDDIE.

Bêche-de-Mêr, or Trepang, Page 27.

The *Holothuria edulis* is one of several marine animals known as the Trepang, which are fished extensively by the Malays of the Eastern Archipelago for the Chinese market, where they bring high prices. They belong to an order of the *Echinodermata*, the class which includes sea-urchins, star-fishes, sand-stars, brittle-stars, &c. The body of the Holothuria is free and cylindrical; invested with a coriaceous or leathery integument, interspersed with particles of calcareous matter; and provided with tube-feet, locomotive organs like those of the sea-urchin, arranged in five rows or dispersed irregularly over the surface. The mouth is surrounded by an elegant fringe of feathery retractile tentacles. The animal is endowed with respiratory organs, a nervous system, and an equipment of arteries and veins, which place it higher in the struc-

tural scale than any other members of its class. The outer integument is endowed with a remarkable degree of contractility, in virtue of which many species, when injured or disturbed, empty themselves of the whole of their internal organs. The late Professor Edward Forbes remarks—"It is usually stated that the Holothuriæ do so whenever they are taken, but such is not the case. I have never seen the animal disgorge its intestines, but specimens of many species have I seen in which there was not a trace left of the creature's bowels and other internal organs, though it seemed, when taken, alive and healthy. It is astonishing how long they can live deprived of the most essential parts of their organism." The trepang measures from a few inches to a foot or more in length, and two or three inches in girth. When taken, it is gutted, dried in the sun, and smoked over a wood fire.

THE SCREW PINE, Pages 37 and 72.

THE Pandanus, or Screw pine, is a native of tropical countries, and abounds in insular situa-

tions, as in the Eastern Archipelago, the islands of the Pacific, and especially in the Isle of France. Its long, tapering, fleshy leaves, similar to those of the pine-apple, are disposed upon the stem in a spiral or screwlike manner, and hence its name of screw pine. The stem is smallest below, and is gradually thickened upwards, and, being crowned with massive foliage, acquires an enormous top-weight, which the spindle-shaped stem below would of itself be inadequate to support. An admirable contrivance of adventitious or aërial roots provides against this apparent deficiency in the habit of the plant. These roots are emitted from the stem just as they are required, and invariably take the direction of the earth, into which they ultimately strike, at an angle suitable for their acting as mechanical props to the main stem. But the adventitious roots serve another purpose. While each root is being developed, its lower extremity is invested with an integument resembling a little saucer, which collects rain and dew to promote its elongation, and also protects its tender absorbents from injury, till, burying itself in the earth, the new root throws out true rootlets or spongioles, which act as

feeders to the parent stem. The figure of a screw pine formerly in the Botanic Garden of Glasgow is introduced at page 37 to illustrate the peculiar screwlike arrangement of the leaves. The figure at page 72 represents a celebrated specimen, the *Pandanus odoratissimus*, in the Royal Botanic Garden of Edinburgh. Many years since, on being shifted from one palm-house to another, a lateral branch came in contact with the threshold, and sustained considerable injury at its junction with the stem. The branch would probably have perished, had not advantage been taken of the provident economy which enables the plant to increase its supports when required. The injured limb was carefully bound up, and before long a new and powerful root was put forth exactly at the point of junction of the stem and the branch, where the damage had been inflicted; and by the time that this crutch-like root struck its extremity into the soil below, it had acquired thickness and strength proportionate to the burden it was intended to sustain. So it remained for many years, the largest and strongest of all the aërial roots. But the lateral branch itself was meanwhile increasing in length and weight, till

it required an additional prop, which in due time was provided by the tall adventitious root, standing apart from all the rest, as seen in the left of the figure. The tree is upwards of fifty years old, and has attained a height of forty feet, with a stem about two feet in circumference. The *P. odoratissimus* is one of the species of this genus found in Australia. Mr. Napier observed that the characteristic spiral of the species examined by him was "as frequently right-handed as left-handed," and when "only two trees were found together, the spiral of the one was invariably right-handed, while that of the other was left-handed." Dr. Livingstone found the screw pine and the mangrove growing in abundance at the Kongone mouth of the Zambesi. "Many of the screw pines," he observes, "are so tall as in the distance to remind us of the steeples of our native land, and make us relish the remark of an old sailor, that but one thing was wanting to complete the picture, and that was a grog-shop near the church."

THE GOUTY-STEM TREE, Page 81.

The gouty-stem tree, *Adansonia Gregorii*,

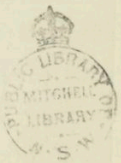
has been recently discovered in Australia, the only other known species of the genus being the *A. digitata* of Africa, one of the largest trees in the world, and known as the Baobab. The gouty-stem tree is described by Dr. Bennett, in his *Gatherings of a Naturalist in Australasia*, as having a trunk with the aspect of a gigantic yam, filled with abundance of mucilage, similar to gum tragacanth, forming a reservoir of aliment suited for the climate. The fruit is of an oval form, resembling a small gourd, covered with a tissue not unlike the nap of coarse cloth, the rind yielding a dark-red gum, and the shell containing a farinaceous-looking substance, dry and dense, with a strong acid taste, enveloping the seeds. When ripe, "the mealy portion, which has an agreeable acidity (very much like that of cream of tartar), melts in the mouth, and is particularly refreshing. The pulp consists of gum, starch, sugary matter, and malic acid." Dr. Bennett mentions that the tree is found in sandy plains, or in low and rather barren stony ridges; its stems—of enormous diameter, but of most disproportionate height—forming a striking object in the landscape. "The measurement

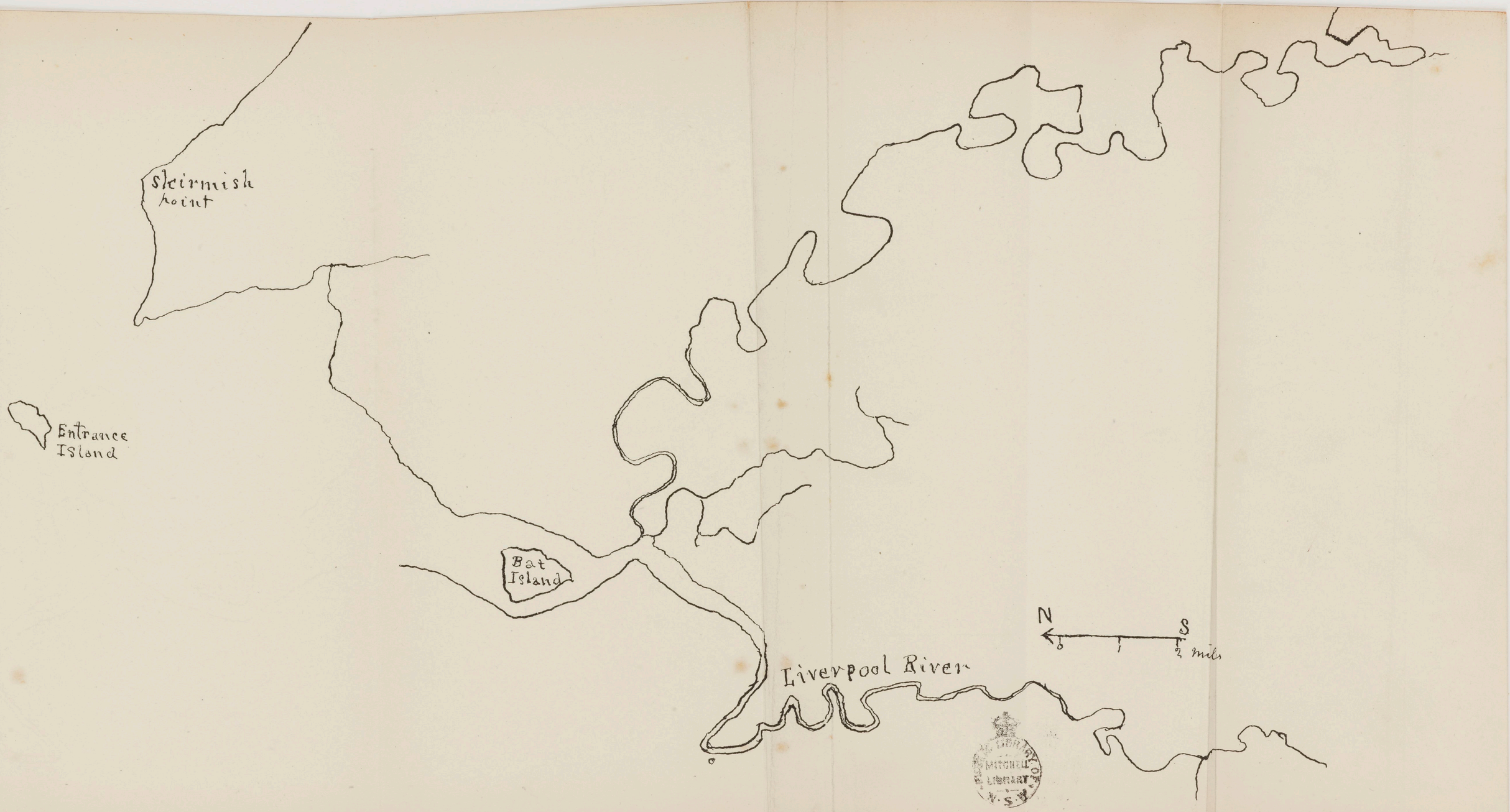
of the largest of the Australian trees represented in the engraving was, as Mr. Baines informed me, eighty-five feet in circumference at two feet from the ground. One main stem measured thirty-five feet, and another forty feet in girth. . . . The leaves, and also the bark and sap-wood of the trunk, yield a large quantity of mucilage, which in Africa is used by the natives, mixed with water, as a cooling drink, and also in their food. The wood is peculiarly soft, spongy, and elastic, does not yield very readily to the axe, and is unfit for timber when cut down; it is also useless as fuel, for the same cause." The gouty-stem tree belongs to the natural order *Sterculiaceæ*.

The Mangrove, Page 87.

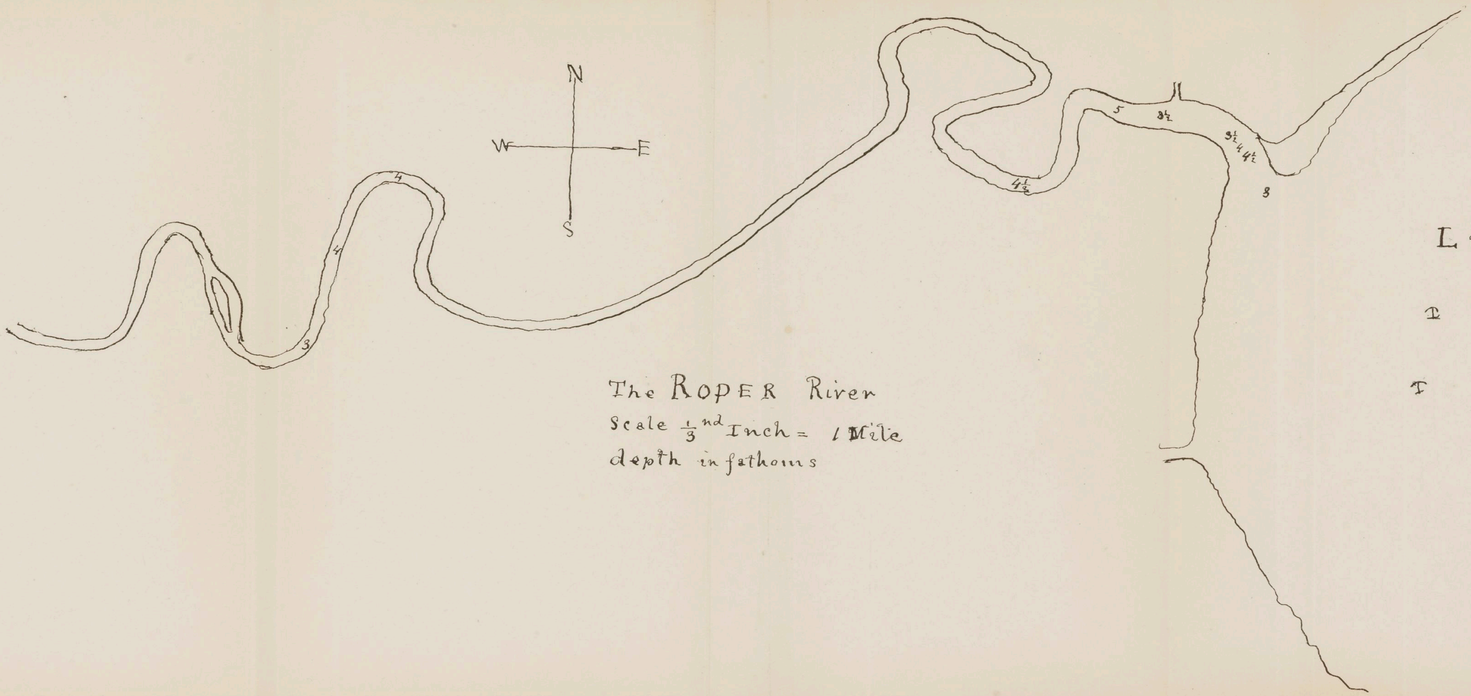
The Mangrove, *Rhizophora Mangle*, inhabits muddy sea-shores throughout the tropics. Dr. Livingstone observed mangrove jungles at the mouth of the Zambesi; and the plant even occurs on the coasts of Florida and Louisiana. Its aërial roots spring both from the main trunk, as in the Pandanus, and from the

branchlets, as in the Banyan. The mangrove is remarkable also for the germination of its seeds whilst yet within the seed-vessel, and attached to the parent plant. Were the seeds to be shed in the usual manner, they would fall into the water and be carried away by the waves of the sea or the currents of large rivers, on the banks of which they sometimes abound, and would be thus removed from any place suitable for their germination and growth. But all risk of this description is obviated by the long radicle perforating the seed-vessel, whereby the young plant, when detached from the stem, drops into the swamp and becomes fixed. Extensive forests of the mangrove are thus self-sown on the margins of seas and estuaries. When the roots are left dry by the ebb of the tide, they are observed to be covered with molluscan and other animals—a circumstance which gave rise to the old story of oysters growing upon trees.



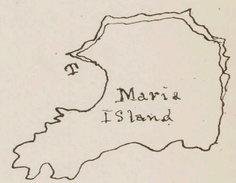

Skirmish
Point
Entrance
Island
Bat
Island
N
S
0
1
2 miles
Liverpool River

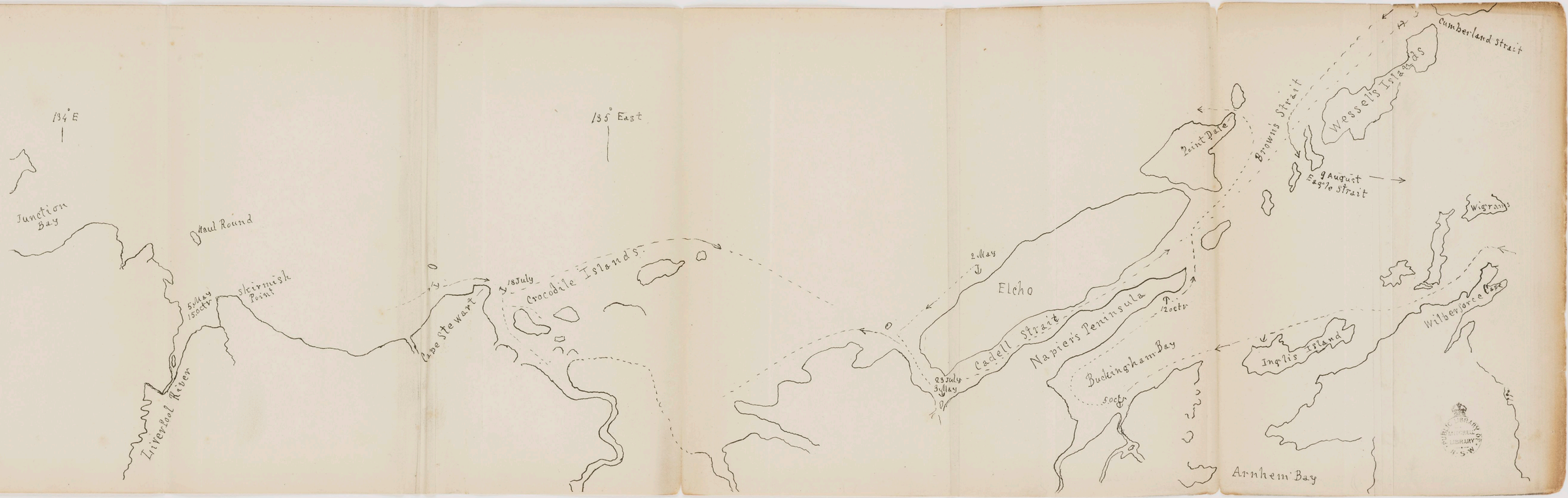

Timor
Koepang
Cape Londonderry
15°S
125° E
Western Australia
Stag C.
Pearce C.
Victoria R
Melville I
Adams B
Adelaide R
Mount Norris B
Goulburn I
Junction B
Liverpool R
Cape Stewart
Crocodile Is
Settlement
Wessel
Colony of South Australia
Blue Mud Bay
Bickerton I
Roper R.
Limmen Bight
Et. Maria
Gulf of Carpentaria
New Guinea
Torres Strait
Cape York
Jan 1770
Cape York
8 April
10°S
145° E
Melville C
15°S
QUEENSLAND
Et. Swears
Albert R
Norman R
Bourke



The ROPER River
Scale $\frac{1}{3}^{nd}$ Inch = 1 Mile
depth in fathoms

Limmen Bight
Gulf of
Carpentaria




134° E
135° East
Junction Bay
Haul Round
5 May 15 octr
Skirmish Point
Liverpool River
Cape Stewart
18 July
Crocodile Islands
2 May
Elcho
Cadell Strait
23 July
3 May
Napier's Peninsula
12 octr
Buckingham Bay
5 octr
Point Dale
Browns Strait
Wessel's Islands
Cumberland Strait
9 August
Eagle Strait
Wigram I.
Wilberforce
Inglis Island
Arnhem Bay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