

V.—*Discoveries in Eastern New Guinea, by Captain Moresby and the Officers of H.M.S. Basilisk.* By Captain J. MORESBY, R.N.

[Read, February 22nd, 1875.]

IN November, 1873, a Paper of mine, giving a brief outline of H.M.S. *Basilisk's* work in New Guinea, was read before you by your esteemed Secretary, Mr. Markham.* Since then I was sent in command of an expedition to substantiate and follow up that work; and this Paper will give you, I trust, a summary of the results accumulated during these two cruises.

I confess I am amazed to think that the very outline of the third largest island in the world should have been unknown till now, and the navigation between its north-east coast and Australia invested with such imaginary dangers as to prevent communication between these shores.

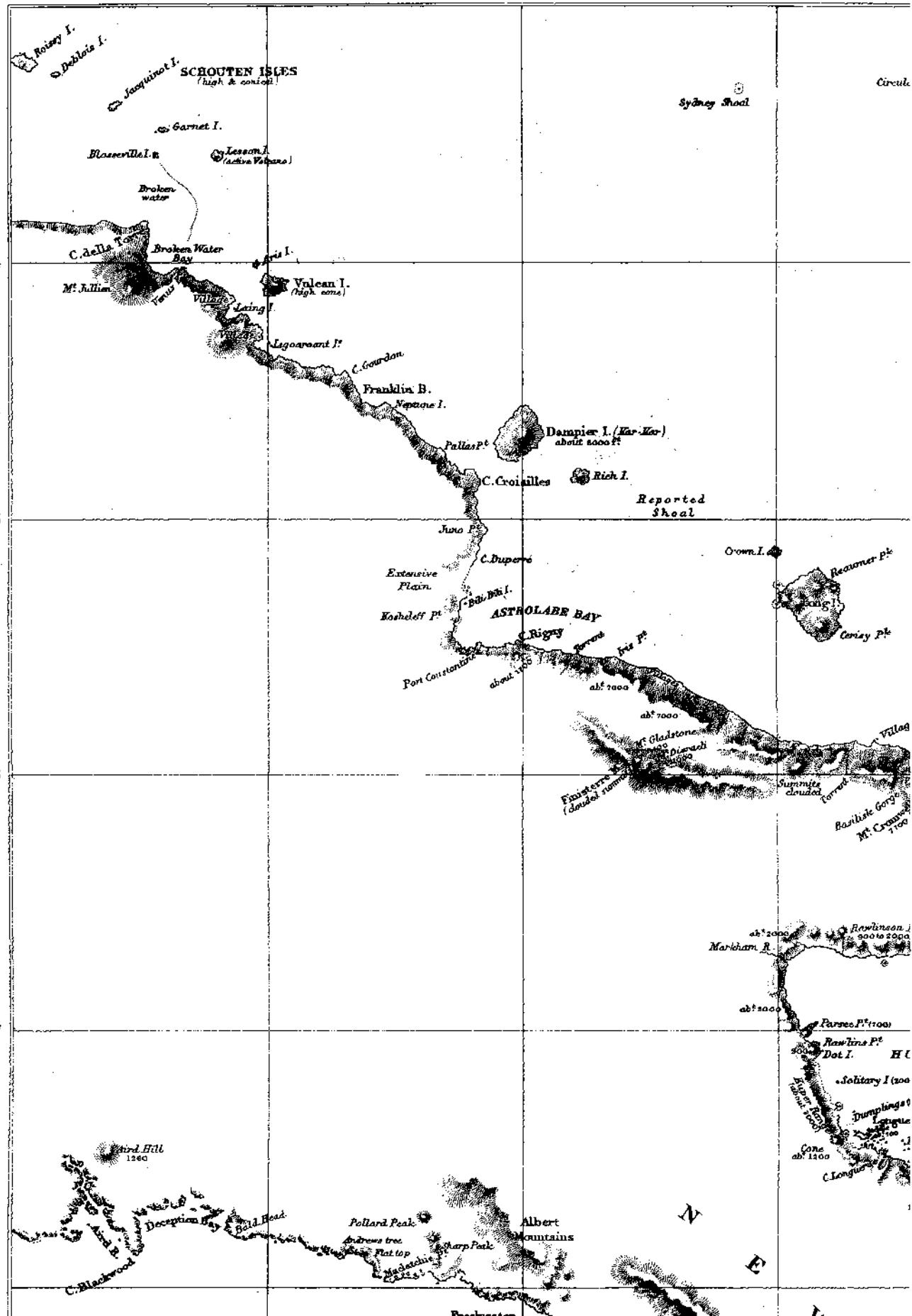
I will first now endeavour to show you what I have accomplished, in conjunction with my able assistants, Lieutenant L. Dawson, Admiralty Surveyor, Lieutenant Sydney Smith, Navigating-Lieutenant Mourilyan, and the other officers of the ship; and secondly, give you the information we have been able to gather concerning the natives.

In brief, then, we have proved that East New Guinea ends not in a wedge, as hitherto imagined, but in a huge fork, the lower prong of which is cut up into an archipelago of islands. Between these new islands and the peninsula which forms the northern prong a sheet of water lies, about 45 miles deep and 12 to 18 in breadth, named by me Milne Bay.

This new archipelago consists of about sixty islands, large and small. Of these the largest, Moresby Island, is about 36 miles in circumference; Basilisk Island nearly as large; Hayter and Heath Islands somewhat smaller; many of the remainder being from 4 to 12 miles in circumference, and inhabited. These islands are mostly lofty and volcanic, and richly wooded.

Moresby Island, a fair type of the rest, rises boldly from the sea to a height of 1600 feet, rich in fruit-bearing and timber-trees, whose dark tropic green is relieved by the various earth-tints of the cultivated and terraced land, and the lighter greens of yam and taro. Here and there the eye rests on great grassy slopes that look like English meadows ready for the scythe; but a giant scythe, indeed, would be needed to cut them, for this grass is 12 feet high. We found it very difficult to make our way through to reach a good look-out from above, and the only plan that succeeded was for the leading man of the party to throw himself bodily forward and press the grass down with

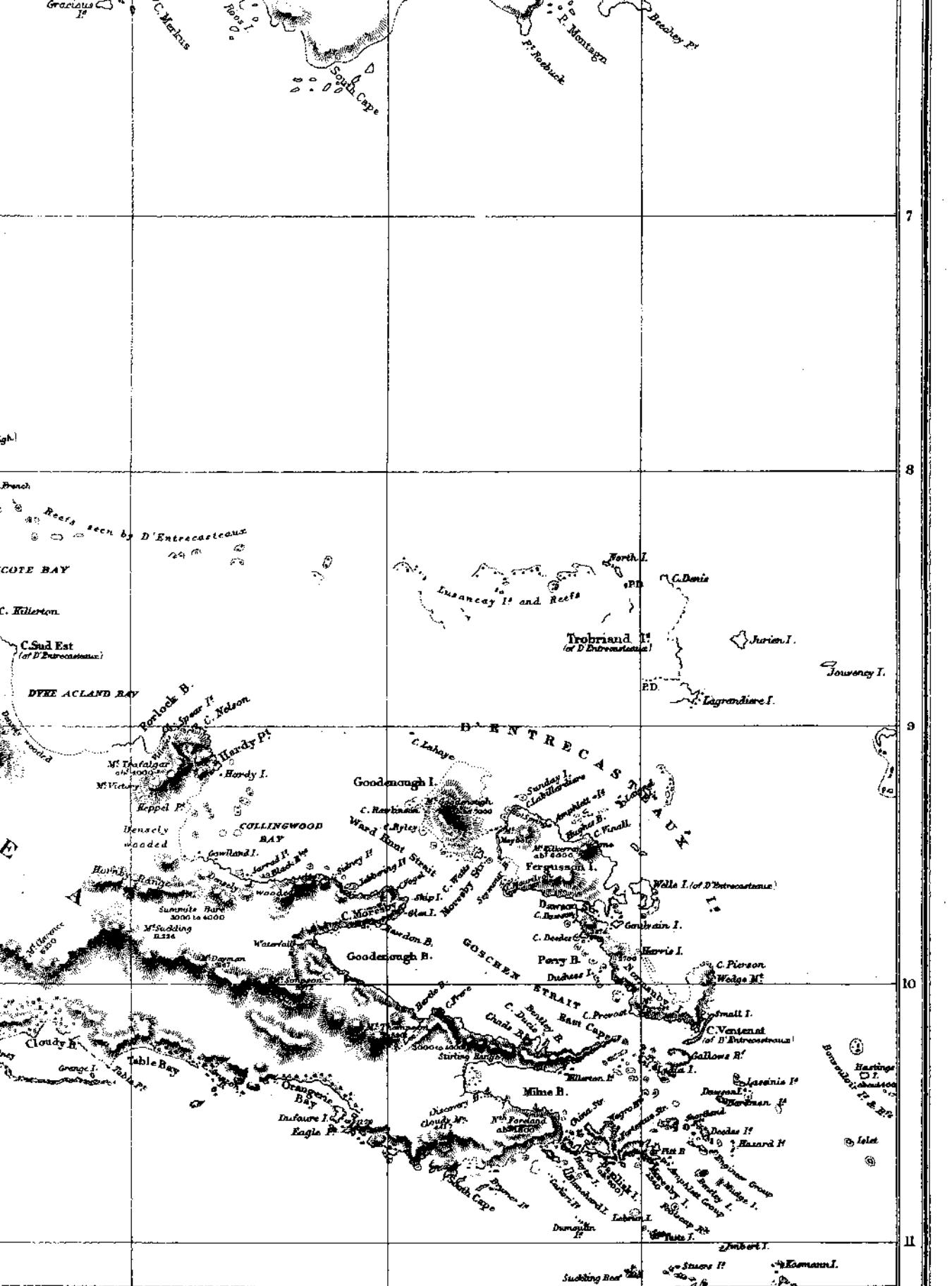
* 'Journal of the Royal Geographical Society,' vol. xliv., p. 1.











bis dead weight. We relieved each other frequently at this duty, but still found it exhausting and most unpleasant, as we bled all over from the sharp grass. On the shore are scattered the most singular dome-shaped grassy hillocks, which made for us natural surveying stations. At the water-line the shore is broken into fine deep-water bays, some five of which are good harbours. Villages cluster to the edge of the calm waters, and here and there a coral-reef runs out, from which the dusky fishers ply their task.

I would I had the power to tell you of the glorious panorama which greeted us from the top of Glenton Island, the summit of which we had cleared with immense labour from its giant forest-trees, that the tiny theodolite might sweep an horizon never before gazed on by our race. Six hundred feet below us, almost as the plumb drops, the light waves curled on a snowy coral-beach. To the west the wooded peaks of Moresby Island closed the view; but on every other side island after island floated on the bosom of an intense blue sea, some volcanic, lofty, and rugged, others coralline, low, white, and covered with graceful trees, with every variety of form and tint, of light and shadow, in the nearest ones, whilst those beyond faded out as they distanced into dim shapes, faint clouds—very dreams of islands—giving one a sense of the profusion of creative power that was almost overwhelming.

The *Basilisk* has had the honour of fixing the position and laying down the coast-line of the D'Entrecasteaux group. These islands were seen from a distance by D'Entrecasteaux 94 years ago, as he sailed in search of La Perouse; but he never visited them, and he saw them on the east side only.

We have proved them to consist principally of three large islands, separated by narrow straits from each other and the mainland of New Guinea; and as their first surveyor and visitor, I have taken leave to name the islands Normanby, Fergusson, and Goodenough; and called the straits Ward Hunt, Goschen, Dawson, and Moresby. These islands extend north and south about 90 miles, and afford harbours and anchorages.

With your permission, I will give you a slight account of this survey. Lieutenant Mourilyan and I, with an engineer and seven men, started on March 7th in our steam-pannace, with a whale-boat in tow, loaded with fuel and provisions for a week. We left the ship in Dawson Straits, and steaming to the westward we passed close under the high volcanic mountains of Fergusson Island which bound the strait to the north. The shore that we coasted was dotted with villages high on the hills, peeping through the sombre tropical green. We could see that our appearance caused great excitement amongst the natives,

who must have thought us gods moving rapidly on the water without exerting an effort. They raced for miles along the beach inviting us to land (but we could not accept their invitation), shouting their cry of surprise, "Hōō-ee! hōō-ee!" Turning the western point of Fergusson Island, we found ourselves at the entrance of a fine strait separating Fergusson from Goodenough Island. Both these islands, with their forests topped by bare grey peaks, are grandly picturesque objects, Mount Goodenough rising magnificently to a height of nearly 8000 feet. The sides of this great mountain are cultivated in patches to a height of about 2000 feet; gradually its woods give place to barrenness, and its summits stand bare and knife-edged against the sky. Mountain torrents dash down its ravines and flash out at times from their dark-green setting, like molten silver.

Night now closing, we sought to anchor between a small islet and the shore; our draught of water was but 12 or 14 inches, and yet we could obtain no anchorage; the channel was full of mushroom-coral, which rose like great pillars from a depth of 20 to 30 fathoms to within 3 or 4 inches of the surface, so close together that after many a weary trial, off the entrance of lovely coves and delicious-looking bays, we had to seek a precarious anchorage in 20 fathoms' water outside these coral pillars, on which a dangerous surf was breaking.

The natives then crowded alongside us: but we were weary and wanted to have our evening meal in peace, to obtain which we blew the steam-whistle, and their consternation was absurd in the extreme; they seized their paddles and glided off into the darkness. All night long the near village clamoured like a frightened rookery, and our look-out men were frequently startled during the night by natives stealing out on the reef to within a few feet of us. At last some sleep being needful, I caused a rifle to be fired to seaward, and this secured us some quiet. Next day we failed for want of fuel to completely circumnavigate Goodenough Island. We landed on it and found it the home of the megapode and a variety of exquisitely-plumaged birds, unknown to us; also of parrots and lorries.

Passing back to Fergusson Island, we landed at a large village in Moresby Straits. Strangely enough, for we saw no such thing elsewhere, the men hid themselves, and an old lady, with a very pleasant face, paddled off to us in a catamaran; we gave her strips of red cloth, and she became quite friendly. When we landed the married women alone advanced to us, the men appearing, but keeping back in evident timidity; but the presents distributed amongst the women soon brought the men about us, all anxious to exchange their stone-axes for our rusty

iron-hoop. So entire was my confidence in the peaceable disposition of these people that, accompanied only by a seaman, I visited their inland plantations, and found large enclosures well fenced in with bamboo, producing tropical fruits, yams, sweet potatoes, Indian corn and sugar-cane. The sago-palm grows most abundantly here; and the natives mash the sago in immense troughs, which I at first took to be worn-out canoes. We all enjoyed this food, and used it largely.

The good feeling of these natives deserves particular mention: they had never seen the *Basilisk*, and knew nothing of our possessing superior arms. We were only ten men amongst hundreds, and they knew that we carried iron-hoop on our persons, a thing of priceless value in their eyes; but not only did they respect our position, but they helped us over obstacles, showing us the best paths, and took care of our clothes when we bathed in their cool streams. Here, a mile from the beach, I saw large masses of coral-rock cropping up at perhaps 100 feet above the sea-level in close vicinity to volcanic cliffs. There was a singular absence of coral-formation on the north side of Fergusson Island; and the beach and bottom of the sea, formed of black volcanic sand sloping gradually into deep water, offered many valuable anchorages. No natives lived on this part of the island, and we could not find any fish in the bays, but a wallaby was shot near the beach. We discovered here a number of boiling mineral-springs, strongly alkaline; they united themselves in one large rivulet, which offered any degree of temperature to our bathers. Other hot springs may exist here at the bottom of the sea, which would account for the absence of fish in the bays. In the sand and mud thrown out by these springs we found very small specimens of rubies and amethysts, evidently chippings from larger stones.

Our return to the ship was very arduous work; we had heavy weather and were out of coals, but by burning wood and greased coal-bags we succeeded in getting back.

Now, with regard to the great Louisiade reefs, I must say a few words. Our work here has proved that these reefs, hitherto deemed an impenetrable barrier between Australia and North-East New Guinea, present, in reality, a wide open gateway, through which ships may safely pass from the one to the other, and enter on a shorter course to China. Previous to this discovery three routes lay open between Australia and China. Of these the shortest, or New Ireland passage, ran inside the Solomon Islands, and leaving the Louisiade Archipelago to the west, went between New Britain and New Ireland, and so on to China. Our new route lies to the west, instead of the east of the Louisiade reefs, and shortens the dis-

tance by about 300 miles, without, to my knowledge, increasing the danger. Eventually the trade with China will be carried on by steamers, and this, the shortest route, will doubtless be the route. Near Teste Island the Louisiade reefs sink from the surface to a depth of 10 or 12 fathoms, and so continue for more than 100 miles to the west.

To the immediate west of Teste Island ships bound by this new route pass over this sunken barrier; and here Nature has placed such striking landmarks that a land-fall can be unmistakably made. Teste Island is easily recognisable. Its peaks rise to a height of 300 feet, and look like islands at a distance. Four miles to its west stands Bell Rock, a great dome-shaped mass of rock, rising perpendicularly from the sea to a height of 500 feet, wooded over wherever a crevice affords room for a tree to grow, and marking well the entrance to the new route: it may be passed by a vessel within a stone's throw. Thence, as the ship passes between Moresby Island and Engineer's Group, not a reef lies in the way. To the north-west of Slade Island the passage lies between two reefs about 2 miles apart, and a passage of 4 miles' breadth leads to the point of exit between Cape Ventenat and a reef which I have named Gallows Reef. The channel here is 2 miles wide; and Gallows Reef being awash, and marked by two tree-covered islets, affords sailing-marks which remove all danger to the navigator.

Another useful gift which the *Basilisk* has been able to present to the mariner and the merchant has been the discovery of harbours on these once inhospitable coasts. I cannot trouble you with a description of these many new harbours, but will speak of a few.

1. Robert Hall Sound, South New Guinea, in lat. $8^{\circ} 50' S.$, long. $146^{\circ} 35' E.$, is well marked by Yule Island at its entrance. I have a great belief in the future of this noble sheet of water, seen from seaward by Captain Owen Stanley's survey, but never entered till now, by a passage we have found off the south-east end of Yule Island. A good, safe, clear channel leads in, and the harbour is perfectly protected, and land-locked with deep water, for hundreds of ships to lie safely. Its shores are low, swampy, and mangrove-covered, and probably unhealthy; but Yule Island, near which ships would anchor, is high and healthy ground. At the head of the harbour Hilda River issues, navigable for steam-launches, but too rapid for row-boats to ascend, destined in time to bear the valuable woods and many products which here await the advent of commerce downwards on its rapid bosom.

2. Port Moresby is a safe, commodious, double haven, lying 60 miles to the east of Robert Hall Sound, at the point where

the swampy coast first gives place to coral, white sand and shells. Truly this harbour was "the desire of our eyes;" and when, after much search in open boats, we discovered this harbour from Jane Island, we were very joyful. Then the great anxiety arose as to whether we could find a good entrance; and for two days more we sounded in our little galley and cutter, far away from the ship, inside the great barrier-reef, to find an entrance. Suddenly I dropped my lead 50 fathoms down, and finding no bottom, knew that the entrance was found. Two days after we took the ship in. The outer harbour of Port Moresby is an extensive bay, surrounded by open, grassy, round-topped hills, thinly timbered with the Australian gum-tree, whilst rich tropical valleys lie between. There are several large native villages on its shores. Jane Islet, about 5'0 feet high, lofty and precipitous, wooded and cultivated, stands in the centre of the outer harbour, and if fortified would render it impregnable. The eastern waters are a mass of coral-reefs; but the western are clear, and just the right depth—9 to 12 fathoms—for anchoring. A fine, clear passage leads to the inner, Fairfax Harbour; and in this inner broad sheet of water, shut round by high land, the *Basilisk* anchored in 5 fathoms. On its southern side from the hill under which she lay a considerable quantity of gold-quartz was taken, specimens of which are here for your inspection. We were too busy surveying to prosecute this discovery; but, as I have before stated, the aspect of the land, and character of the masses of granite-quartz cropping up, lead me to think that gold will be surely found there. This port, from its healthy situation, has already been selected as the principal station of the London Missionary Society.

3. Pitt Bay is a fine harbour, and easily entered; it lies at the gateway of the New Australo-Chinese route at the east end of Moresby Island, embosomed by lofty hills. Hereafter the power holding Pitt Bay will possess the key of the route. At Pitt Bay we took one piece of gold-bearing quartz from the bed of a stream, but though we searched diligently, we could not find a second.

4. Traitors' Bay, on the north coast of Eastern New Guinea, in lat. 8° , and long. 148° E., offers shelter to ships trading on that coast, and possesses a navigable river with a gentle current. This river discharges itself outside the anchorage, over a bar that proved impracticable to our boats. I regret much that I had not time to survey this river, for it seemed to me to lead far up into the country, and I hope some future explorer will follow it up. It needs no words of mine to show you how important it is that this great country should be opened up by water-communication.

Running Survey of the North-East Coast.—Our last work was the running survey of the unknown coast of North-East New Guinea.

On April 27th we joyfully turned the *Basilisk's* head westward, for every mile was now a step towards home.

The first striking difference between these northern and the southern shores of New Guinea is that here there is no outlying barrier-reef, and the shores, instead of shelving outwards, are steep to. The mountains here generally run down to the sea, then follows a shore-reef, from which the plumb-line may be thrown into 50 fathoms of water.

The coast-line is but little broken up, and affords few harbours and anchorages. Speaking generally, from East Cape to Cape Cretin the coast-line may be spoken of as a series of bold headlands, running out 20 or 30 miles to seaward, with deep bays between; this configuration increased our work threefold.

The great Owen Stanley Range may be said to terminate at the head of Milne Bay, but one of its spurs, named by me "Stirling Range," runs at a diminished elevation through the narrow peninsula which terminates at East Cape. This henceforth important promontory on the world's map has no great feature to attract attention. The peninsula has gradually narrowed to half a mile in width. The Stirling Range has ceased, and been succeeded by a low, undulating forest-country, sprinkled with villages, when suddenly an abrupt double-topped hill springs to a height of 300 feet. There is a village at its foot, half-hidden in groves of bread-fruit and coconut trees. Its summits were crowned with tropical forest when first we saw them; but these noble trees fell to our axes, as we made this a theodolite station. A narrow boat-channel separates the cape from two low coral islets, and 10 miles further to the eastward, on the opposite shores of Goschen Straits, rises the dark, frowning mass of Mount Prevost, on Normanby Island.

This, then, is the East Cape, and real eastern terminating point of New Guinea. From East Cape to Cape Moresby, as the crow flies, the distance is about 130 miles, with a depth of 500 to 600 fathoms, and muddy bottom at about 2 miles from the shore. Villages abound here; and the valleys between the hills, and not seen from the sea, are richly cultivated.

Between Cape Ducie and Cape Frere the forest ceases, and is succeeded by an openly wooded level plateau full of villages, backed 2 miles inward by a range of abrupt grassy hills, bare of wood, each defined by a belt of sharp brushwood at its base, crowding down hill upon hill with such a curious effect as to remind us strongly of the plate in Black's *Atlas* of all the mountains in the world. Above the height of 2000 feet the

forest springs up again, and covers still higher peaks to the very top, to a height of 6000 or 7000 feet.

Cape Frere is a noble headland, dropping its huge buffalo-headed mass about 2000 feet almost perpendicularly to the deep-blue sea; and the *Basilisk* looked a mere cockboat in the huge shadow, as almost scraping her sides against the beetling mass she stood in to seek for an anchorage in Bartle Bay. This bay—at the head of which an extensive tract of comparatively low land, marked by terraced plateaus, between which a considerable stream debouched through a dark sandy beach—seemed to afford the certainty of a good safe anchorage for the night; but we were doomed to disappointment—nowhere within a cable's length of the beach would 80-fathom line reach the bottom. At last we let go anchor in 49 fathoms (which is deeper than the water of the English mid-channel), our stern just swinging clear of the beach. The soil about Bartle Bay is very rich, and runs back in a series of clear-terraced elevations to a lofty inland range of mountains. The river which issues at the head of the bay has ploughed deeply through these terraces, so that its banks are exposed for a section of from 10 to 30 feet in height; they are composed of smooth water-worn stones, imbedded in a light gravelly soil. We searched but could find no gold here, nor was any trace seen by us of the precious metal on the north coast of New Guinea.

From Bartle Bay into the bight of Goodenough Bay, a distance of some 30 miles, the bold and fertile coast runs in a W.N.W. direction. There are some fine waterfalls at the head of this bay, flashing down the dark-green mountain-sides, and so much river-water is here discharged that the surface of the sea is quite fresh. The canoes about here are smaller; and quite a different language prevails from that at East Cape.

From the bottom of Goodenough Bay the land turns abruptly in an E.N.E. direction, and so runs boldly out to sea for 30 miles in a rich forest-covered promontory, which ends in grassy slopes marking Cape Moresby, off which are small outlying islands, surrounded by coral-reefs. From this point, looking across Ward Hunt Straits, we could still see Mount Goodenough rearing its stupendous mass.

From Cape Moresby the land trends W.N.W. for 45 miles to the bight of Collingwood Bay, the shores of which are low and densely wooded, and the depth of water decreased to 50 fathoms at 2 miles from the shore. From this point the natives became suspicious and unfriendly, and we experienced much difficulty in communicating with them. In Collingwood Bay we cut a large quantity of firewood from the tall, fir-like trees which generally ornamented the points of land. The land now runs

north-east for 45 miles till it forms a noble promontory, and terminates in Mounts Victory and Trafalgar, 3000 feet high, and Cape Nelson—names which I rejoiced to write for perhaps the last time on the map of the world. The natives here fled at our approach; and we observed that, although belonging to the light-coloured race, they differed in appearance from the natives of East Cape, and wore their hair in long, thin, ugly ringlets.

Cape Ward Hunt lies 40 miles to the westward of Cape Nelson; the deep bay between I have named "Dyke Acland." Its low wooded shores, with the formation so characteristic of this coast, suddenly turn to the north-east and form a bold wooded promontory. Eight miles to the westward of Cape Ward Hunt is Traitors' Bay. Here I had occasion to fire my first and only shot in self-defence. Three of our officers had strayed away from a wooding-party, when from the ship we observed a party of 70 or 80 warriors land from their canoes, fully dressed in feathers and war-paint, stealing on them. Sub-Lieutenant Shortland and I jumped into the dingy with some spare rifles, and gained the beach just in time to put our shipmates on their guard and give them the rifles. Hoping to maintain friendly relations, I advanced alone, armed with a rifle, but holding my arms over my head, towards the bush where the natives were lurking, quite concealed from our view. Suddenly they sprang from the bush to the open beach, and formed in two regular lines, 10 yards in my front: the first line armed with spears, which they held quivering to throw, whilst they moved with a short quick step from side to side to distract our aim, guarding themselves with shields; the second line was armed with clubs. For some seconds I forbore to fire, hoping still to preserve the peace. Finding this hopeless, and that in another second I should be the target for fifty spears, I fired with a snap-shot at the leading savage; the bullet pierced his shield and spun him round on his heel, but glancing off, did not wound him. Immediately the whole body of warriors turned in consternation at the sound of firearms, then heard by them for the first time, and ran for the canoes. We followed till we drove them on board, firing a few shots over their heads.

Passing Cape Ward Hunt we came upon the position assigned in the charts to "Riche Island," so named after the naturalist of D'Entrecasteaux's expedition 94 years since. No trace of any such island now exists. It is probable that D'Entrecasteaux, at a great distance, saw the high land about Cape Ward Hunt, which would then appear as islands, and thus he noted it on his chart.

Huon Gulf lies between Cape Ward Hunt and Cape Cretin,
VOL. XLV.

and is the last of the great bays which distinctively mark the north-east coast of New Guinea. Its shores are well populated, and the natives were friendly. For the first time in New Guinea we observed tappa-cloth used ; they wore it round their waists, and made into high conical caps, which gave them all the appearance of Indian Parsees. Its shores are covered with a rich vegetation ; and especially beautiful are the slopes of the Rawlinson Range, teeming with palms and tree-ferns, and well inhabited. From Cape Cretin to Astrolabe Gulf, a distance of 120 miles, the land trends nearly due east and west, without a break ; the coast-line is backed up by the great Finisterre Mountains, the two highest peaks of which, standing facing each other, I have named Mount Gladstone and Mount Disraeli. At Astrolabe Gulf our survey terminated ; but off the northern shores of New Guinea we took a series of deep-sea soundings, finding from 1500 to 2000 fathoms 25 miles from the shore, a depth probably unequalled in any part of the world in such close proximity to the land.

The *Basilisk* passed from Astrolabe Gulf towards Lesson Island, an active cone-shaped volcano discharging large volumes of steam and smoke. It is densely populated, and the cultivation at its base appears very rich. The natives, a fine-looking race, crowded alongside the ship, eager to barter all they possessed for scrap-iron. Their hair is worn in a preposterous manner, confined behind in a conical case projecting 12 or 14 inches, as a horn from the back of the head. Off Garnet Island the *Basilisk* passed through a large body of brackish water, forcing itself seaward and bringing with it vast numbers of gigantic uprooted trees. From this fact I conclude that a river of large dimensions must exist in the neighbourhood of Cape Della Torre.

Time will not permit me to say more. On June 2nd we reached the Dutch Spice Island of Amboyna, having thus successfully completed the survey of the last unknown coast of the habitable world.

The meteorology of Eastern New Guinea appears to be different from that previously supposed. The north-west monsoon blows from November till March, accompanied by occasional westerly gales, with fine weather intervals. The south-east monsoon, which follows, we never found to blow continuously up to the time of our leaving the coast in May, for we experienced light variable winds and calms ; whilst on the northern shores of Eastern New Guinea the south-east monsoon appears to be altogether arrested by the lofty Owen Stanley Range, the summits of which, during the month of May, were observed with heavy clouds, leading us to believe that the monsoon was

blowing strongly on the southern shores of the peninsula, whilst we on its northern side were sailing in calm and waveless waters.

The barometer showed little or no fluctuation, remaining steady between 29° 80' and 29° 90'; the thermometer in the shade varying from 83° to 86°. The tides varied in rise and fall from 8 to 12 feet.

The Natives.—Having now, as far as time would permit, treated the geographical part of my subject, I will speak of the native race which inhabits the newly-discovered portion of New Guinea. You are already aware that varieties of race exist in this great island. You know of the black Papuan who inhabits the south coast of New Guinea, apparently from Cape Valsch to Cape Possession in the Gulf of Papua. A recent Italian explorer has lately informed you of the existence of a hitherto unknown race, named Arfaks, inhabiting the mountainous parts of north-western New Guinea; and to these we must add the pure Malay race, which, coming from the isles of the Malayan Archipelago, has driven inland the aborigines of the north-west coast, and settled in their stead, as a third type of man. This last is, as you are aware, a semi-civilised Mahometan race, professing Dutch allegiance. Leaving these people, I will introduce to you a fourth—our now first visited race of Malays.

This race is distinctly Malayan; but differs from the pure Malay, being smaller in stature, coarser in feature, thicker lipped, with less hair on the face, being, in fact, almost beardless. The hair of the head is also more frizzled, though this may result from a different dressing. These men have high cheek-bones like the pure Malay; their noses are inclined to be aquiline, and sometimes very well formed; their eyes are dark and beautiful, with good eyebrows. Amongst them we met many men with light hair, and what struck us as a particularly Jewish cast of feature. They rise to a height of from 5 feet 4 to 5 feet 8 inches, are sinewy, though not muscular, slight, graceful, and eel-like in the pliability of their bodies. This race abuts on the black Papuan, somewhere in the vicinity of Cape Possession; but I do not believe that a fixed line of demarcation exists, for in Robert Hall Sound both types of race were present, and the natives varied here amongst themselves in colour, stature, and cast of feature. A mixture of habits also obtained at this point, which confirmed the idea of a fusion of race here. Some chewed the betel-nut Malay-wise, whilst others rejected it; some wore the Papuan adornment of the great bill of the hornbeak as horns on the head. All were destitute of the ornaments made of human bone generally worn by our newly-found Malay race, whilst they one and all decked

themselves with flowers and berries as this race does, but the Papuan never, to our knowledge.

This new race, which presents some slight varieties in itself, appears to inhabit the whole of the eastern peninsula of New Guinea in its northern and southern shores, from about 148° of longitude, to East Cape, which is in $150^{\circ} 53'$ East longitude, and also the newly-discovered archipelago of islands adjacent. I approached these people with caution, knowing that no seamen had ever willingly ventured near their shores, and kept prepared for attack; but veiled my precautions, showed no distrust, and went freely amongst them. Had I been so unhappy as to have needed firearms, I should have used them with full effect, believing this to be the truest mercy; fortunately these kindly people were soon won, and greeted us everywhere with a wondering welcome. Nearing shore I always caused a seaman to stand upright in the bows of the boat, with both arms extended in sign of peace; and we landed two or three only at first, with no arms but the revolvers hid in our breasts, making gestures of friendship. Soon they smiled, and made responses to our signs; drew nearer and touched our white skins, turning up our sleeves and trousers to see if this amazing white colour held all through; and we gave them gifts and soon got to bartering, in which they showed great honesty. The young women, some of whom were really pretty and graceful, were particularly curious about us; but if we ventured to touch their dark shapely limbs, they fled away with a start and a scream, and seldom returned. These natives are not devoid of principle, I am sure. I once attempted to barter an axe with a boy for a handsome shell-necklace he wore. He made signs that the necklace was not his, and refused to trade; his companions urged him vehemently, even trying to force it off his neck, and at last so far prevailed that he took the axe from my hand and half-unfastened the necklace. Conscience pricked him, and he hurriedly thrust back the axe, and making signs that he would go and get leave from the owner to sell it, he paddled off in spite of the jeers of his friends.

When the *Basilisk* first discovered Moresby Island, and cast anchor in Hoop-Iron Bay, we could see the natives on shore rushing frantically about: finally a fleet of canoes, containing men only, came off and hovered about us, showing no arms, but wearing bird-of-paradise plumes, and handsome shell-disks on the side of the head. These disks they shifted to their hips when once convinced of our pacific intentions. I have a heartfelt pleasure in stating that all our subsequent intercourse with these people was marked with good feeling and kindness on both sides. Their single evil propensity seems to be a love of pilfering; and it was amusing to see their skill in hiding small

articles in the large orifice they made in the lobe of the ear, or between the tight ligatures they wear as belts and armlets, and their skin. They steal skilfully also. Having adroitly knocked some nails or an instrument off the carpenter's bench, or secretly unscrewed a nut, they would walk over the side, concealing it under the hollow of the foot. I thought it wise to overlook these small delinquencies ; but on one occasion they went a step too far. H.M.S. *Sandfly* (under my orders), when lying in Possession Bay, had sent a boat on shore with four men for water, and the natives had stolen their water-barricoes and boat's crutches, and all the iron-hoop they had about them. I directed Lieutenant Fowell to lay an ambush and seize some natives ; and two were secured accordingly, after a long struggle, in which their smooth skin and supple limbs eluded the attempts of our strong seamen. They were taken on board the *Sandfly* and kindly treated, but evidently expected instant death. Their wives and friends came off weeping, and offering presents to buy them off. The natives deserted the ship, and kept close to the shore in their canoes ready for flight into the bush : however, I went amongst them in a dingy, and succeeded in making them understand that our prisoners should be liberated on the restoration of the stolen property. On the second day the articles were brought back, and we released the men, to the intense delight of their friends, who then sent a large hog on board the *Sandfly* to show their gratitude. A few days afterwards our carpenters, working over the ship's side, missed a saw, but before we could take any step, we beheld a large canoe coming off in which an old man stood holding up the saw, and on reaching us he returned it, and expressed his anger at the theft.

I incline to the belief that these people have not any religious feelings. They certainly have no external form of showing such, or we should have observed it ; for with the same limited opportunities of observation we distinguished many observances as distinctly religious at all the other South Sea Islands visited by us. For instance, at the New Hebrides there was an organised system of devil-worship, with duly-appointed priests and rites : idols also were everywhere to be found. Here, however, no idols were to be seen. Occasionally grotesque nude figures were painted in red and white ochre on the ends of the houses, but for ornament only. One action only seemed to have a religious tendency, namely, their universal custom of bringing a village dog and dashing its brains out in our presence, after which ceremony they showed perfect friendliness. We noticed, also, that in every village an old woman, much bedizened with ornaments and ropes of shell-necklaces, seemed to hold a certain sort of authority.

They bury their dead in a respectful manner in the ground, and build small thatched huts over them, on which coco-nuts were hung. These coco-nuts, hung plentifully in the villages and even far out on the reefs, may have been votive-offerings. In some few cases these burial-huts are rudely carved and fenced in with a bamboo palisade, as if the resting-places of chiefs ; but we saw no sign of chieftainship amongst the living.

These Malays must be considered a more civilised race than the Papuan ; they possess the art of pottery, still unknown to the Papuans. In every village women may be seen moulding the clay, whilst others tend the wood-fires in which the globed jars are baking. They are also better cooks ; for they boil their food, as well as roast and bake it like the Papuans : and I have frequently enjoyed the vegetable porridge they make of yams, taro, and mangrove fruit stewed in these bowls, with coco-nut shred finely over.

As fishers they far exceed the Papuans in art : the latter fish only with hook and line and the barbed spear, whilst our new friends make fishing-nets of various sorts with great skill ; one, like the English seine, made with the fibre of a small nettle-like plant ; another is what I call a "trap-net," and consists of a netted bag, with the mouth kept open by a bamboo-spring. It is let down with the bait in the bottom, the mouth open. The fisher, on feeling a fish, pulls a string which closes the bag and draws it up with his prey.

The Papuans have but one kind of canoe, dug out of a single tree and balanced by heavy out-riggers ; but these people have several kinds of canoes, of which the trading-canoe is best, having topsides laced on with split bamboo, strengthened by strong knees inside, supporting a sort of half-deck, under which they stow their goods. They are most ingenious basket-makers, and make strong good-looking baskets to fit one inside the other in a nest : they also make capital woven-bags for carrying their property ; and they make light rope and strong cord from various vegetable fibres, that would not disgrace an English rope-yard.

Their weapons consist of stone tomahawks, clubs, and axes, and of spears, and heavy wooden swords and hair-slings ; and that these weapons are not very effectively used Lieutenant Deeds, of the *Basilisk*, had ocular proof, as he witnessed a fight between the Slade islanders and those of East Cape and Moresby Island, whilst detached on a surveying cruise. The combined warriors of East Cape and Moresby Island approached Slade Island in some twenty canoes, containing about thirty men each, but remained thirty yards off shore, throwing spears and sling-stones at the Slade Islanders, who waded out to meet them.

and returned the compliment. They maintained this respectful distance for two hours, when they drew off and nobody seemed wounded, such was their skill in dodging these missiles. We rarely saw a wounded man amongst these people, and but few enemies' skulls ornamented the outsides of their houses.

Their houses and those of the Papuans do not differ materially. They are built on poles, sometimes 12 or 14 feet from the ground, and consist of one large tunnel-shaped room, well thatched over. A pole, with notched steps, leads from the ground to a small landing-place or verandah, behind which is the small opening leading into the interior. This verandah is the favourite lounging-place of the family; and their implements of war, fishing, and labour, are carefully hung round on the inside walls.

They are rude but successful cultivators of the ground, using stone mattocks for turning up the soil to a small depth, preparatory to planting their yams and taro. Their food is very plentiful, and consists of fish, yams, taro, fruits, and pork on great occasions, with abundance of the delicious crabs which abound here, and they do not make any kind of intoxicating drink. This plenitude of food may have some influence in checking a desire for cannibalism, which certainly does not prevail largely amongst them; though from the fact that we saw some of them wearing bracelets of human jawbones, and necklaces made of the spinal vertebrae, which had evidently been subjected to the action of heat, coupled with some signs they made us, we suspected that cannibalism was not wholly unknown to them.

These people are affectionate to their children: they make toys, especially models of canoes and small spears, to amuse them and encourage them to have pets. The little ones were constantly to be seen petting little pigs, with which they ran off at our approach, lest we should barter for them. They had also multitudes of tame parrots, lories, cassowaries, and kept several varieties of the marsupial cuscus in cages. In some cases the parents were willing to barter their children for our iron axes.

They did not (like most savages) keep their wives in the background, but allowed them to meet us freely and have a voice in the trading. On one occasion a husband was heartily belaboured by his wife with a paddle on the head and shoulders, because he did not barter satisfactorily, and his friends, instead of interfering for his relief, only shouted with merriment. He did not retaliate, but looked foolish. Nevertheless, the lot of the women here is to do all the heavy labour, whilst the men fight or fish, as in all other savage communities.

The men are but slightly tattooed, but the women tattoo all over, sometimes in graceful patterns. The men paint grotesquely

with ochres, and sometimes shave the head, and paint it, and the whole body to match, of a shining black, with charcoal and coco-nut oil. The women crop their hair short, the men wear theirs long and frizzed, and all disfigure their mouths with chewing the betel-nut, except the younger women. The men wear a waistcloth only, the women the usual South Sea garment, the short grass petticoat or "ti-ti."

A New Guinea exquisite, lithe, dark, and graceful, with shell-anklets, making his small feet seem still smaller, is not an unpicturesque object. His waist is braced in with many turns of black cord, the outside of which is plaited in with gold-coloured straw; his neck is bright with a red shell-necklace, from which a boar's tusk depends, and from the tight ligatures and bracelets on his arms the graceful pandanus-leaf flows far behind, curiously embroidered. Bright red flowers and berries adorn his hair, and his face is frequently painted red at one side and black and white at the other.

The only maladies we perceived amongst them were elephantiasis, ulcers, leprosy, and other skin-diseases; otherwise they were vigorous and healthy.

In conclusion, I am anxious to take this opportunity of expressing my grateful sense of the exertions made by the officers of H.M.S. *Basilisk* during both our New Guinea Surveys. Their work was continuous, arduous, and frequently exhausting, from circumstances of climate, exposure, deprivation of comforts, and physical efforts of all sorts. No one thought of rest; all felt that a really stupendous task had to be accomplished within the limits of a comparatively short time, and laboured heartily to achieve it.

I think we all felt that English hands only ought to finish the work of Cook and Dampier in this quarter of the globe, and that it was well to establish for England a right on these shores, knowing that such a right will become of importance in the future.

Having been long in Australia, we naturally felt a growing interest in the future of the great Australian Colonies, and were struck with the importance of keeping them unhampered by any complications that might result from the establishment of foreign settlements within so short a distance of Cape York.

To this end we desired to ascertain if harbours existed on the coast easy of access and possessing strategic advantages. Our secondary desire was to throw the riches of New Guinea open to Australian effort, and so lead to the mutually helpful union which Nature intends between the sister islands of Australia and New Guinea. Providence has crowned our efforts with success, and time, which tests all things, will, I know, prove our

work to be good and useful. In this thought we must find our reward.

NATURAL HISTORY REMARKS.

I do not feel that I am in a position to say much concerning the zoology of East New Guinea, for we never penetrated into the country for more than 4 or 5 miles ; but every wild animal seen by us belonged to the ancient marsupial type, showing that the fauna there is of the same low scale of organisation as the Australian. We saw the dog everywhere, wolfish-looking, and savage and cowardly in disposition ; and occasionally the cat, but not rats or mice. We met with various small marsupial animals—wallaby, and a small kind of bandicoot, and one specimen of the tree-wallaby. We saw some animals of the cuscus kind, in appearance like a tiny bear, not in a free state, but caged by the natives. At Collingwood Bay, the First-Lieutenant and I came on the recent droppings of some large grass-eating animal, which we were inclined to think was a rhinoceros. Flying foxes abounded everywhere except at East Cape. They seemed to love low swampy ground. We did not see any alligators at the far east of New Guinea ; but they abounded at the entrance of the larger rivers to the westward. We met with several varieties of snakes, some like the carpet-snake and others we had seen in Australia. The death-adder was the only one decidedly recognised by us. The birds were numerous : we saw the cassowary, eagle, hawk, goat-sucker, pigeon, wild duck (of various kinds), rifle-bird, parrot, and lory. We did not see the bird-of-paradise ; but the natives were largely adorned with its plumes. Some low coral islands, densely-wooded and uninhabited, we found to be inhabited by the bush-turkey or "mound-making megapode." This megapode cannot be compared in size to those we saw in Northern Australia, which were as large as a small turkey ; whilst these are as small as a barn-door hen, of bright brown plumage, with strong yellow legs, and feet not unusually large, as the name megapode would imply. The mounds of these megapodes were about 5 or 6 feet in height, and 25 feet in circumference. The vast quantity of these mounds scattered about showed that these birds had lived and died, undisturbed, here for ages. We found them delicious eating after our salt-beef and pork.

There were many insects, and the butterflies were particularly gorgeous : some, the largest I have ever seen, were as large as a man's hand, and looked like birds when flying. We saw here a curious Australian insect, nick-named by us "Walking-stick." They were 6 inches long, with six slight legs, and coloured

exactly like the bark they fed on. At first we used to pick them up for bits of dead stick. Centipedes and the usual tropical insects were common; but the ant was our chief plague—one, light green in colour, rapid in motion, and about a third of an inch long, seemed to be of two kinds in habit, though not in appearance; for some tunnelled in the tree for a dwelling, and others gummed leaves together, and formed a pendent nest as much as 2 feet in circumference. A small black ant built large mud-nests in the trees here, and at East Cape we saw a black ant nearly an inch long. These ants bit fiercely, and made our task of cutting 600 tons of wood a very painful one. We did not see the large city-building-ant of Queensland.

The rivers contained a small red-speckled trout-like fish. The shore waters swarmed with edible fish, some of which had scales of the most exquisite and brilliant colouring. The crabs we found had small bodies and large claws, and are delicious. Mussels grow to a vast size: I have in my possession shells 22 inches long, and have seen larger. The valuable pearl-shell oyster is found in these waters.

VI.—*On the Inundations of the Yang-tse-Kiang.* By E. L.
OXENHAM, F.R.G.S.

[*Read, February 22nd, 1875.*]

ALL the great rivers of the world are at certain seasons liable to sudden inundations, and in some cases, as in that of the Nile, they recur with periodical regularity. More generally, however, the floods, especially when dependent, not on a fixed certain event like the melting of snow, but on rains and storms, are of a more fluctuating character. The Mississippi in America, the Yellow River in China, and many of the rivers in India, may be quoted as instances of this.

The ravages of the Yellow River ("China's sorrow") have been known to us from our childhood; but that its great rival, the Yang-tse-Kiang, should also be subject to floods and inundations is not so generally known, and it is the design of this paper to attempt to describe and account for—as far as our present information about the country concerned will allow—the inundations which repeatedly overwhelm vast tracts of the country through which the Yang-tse flows.

The only claim the writer has to deal with this subject is that of having resided some three years at Han-kow, a large city of 700,000 inhabitants, situated in the province of Hu-pe, on the banks of the Yang-tse, at the place where the Han River enters