Collingwood, Cuthbert. *Rambles of a naturalist on the shores and waters of the China Sea: Being observations in natural history during a voyage to China, Formosa, Borneo, Singapore, etc., made in Her Majesty's vessels in 1866 and 1867*. London: John Murray, Alblemarle Street, 1868. Pp. 32-128.

Chapter II. Hong Kong to Pratas Island

. . . Birs observed upon the Ship between Pratas and Formosa.

. . . [P. 32] A strong north-east wind prevented us the following day from paying another visit to the island; while, lying under its lee, we remained at anchor for the sake of the shelter it afforded us. But on the second day, towards sunset, our attention was attracted by the curious phenomenon of long rolling waves coming in from the south-west, which increased as the evening advanced, causing considerable motion in the ship. Towards midnight these south-west rollers increased to such an extent, the wind still blowing strong from the north-east, that it was deemed desirable to slip cable and put to sea, since the proximity of the reef was very undesirable if bad weather set in, while the rolling swell endangered our bumping upon the reef in a spot where our fair-weather anchorage left but little room to spare. We kept outside the edge of the reef therefore during the night, and next day approached its north-west corner. Here we saw the terrible sight of the long line of breakers on our lee [p. 33] side, extending for miles along the northern edge of the reef, over which the sea, lashed into foam by a strong breeze of some days' duration, was dashing wildly in a broad straight band of white foam. Finding that the wind freshened, and that we could do no more at the Pratas Shoal, we steered north-east and left the dangerous reef behind.

The explanation of the curious phenomenon of south-west rollers coming in with a north-east wind followed in due time. They were caused by a typhoon which was blowing between 200 and 300 miles to the south of us, and which recurced in lat. 16° 10' N. and long. 116° 30' E., according to the observations of Capt. Symington, whose ship, the "Northfleet," was twice caught in it, and who published an account of the Cyclone.

Pratas Island being so small a spot, and situated 170 miles from the mainland of China and about 250 from Formosa, it is remarkable that so many land-birds should have found a home there; and the incidents of the two or three days which elapsed during our passage from the reef to the Island of Formosa were particularly interesting, as throwing light upon this circumstance. Steering north-east for Ta-kau-con, we experienced a strong head-wind the whole way, that is, the direction of the wind being in a straight line from South Formosa to Pratas Island. We left the reef on May 3rd; on the 4th a large flock of sandpipers met us, going with the wind towards Pratas, where no doubt they would find a resting-place. But the following day, being then a little more than halfway from the reef to Formosa, the rigging was scarcely free at any time during the day from feathered guests, which must have been driven off the Formosa coast by the wind, and some of them at least would have reached Pratas had they not

found a resting-place, and [p. 34] in some instances a passage back, on board the "Serpent." The following birds I observed at various times during the day, and sometimes several of them flying about the ship, and from time to time settling on various parts of the rigging: -- a yellow warbler (Sylvia); a yellow wagtail (Motacilla boarula); a shrike (Lanius), grey with a black moustache, apparently identical with the one already seen on the island; two species of swallow (Hirundo); a small heron (Ardea); a handsome black bird rather bigger than a common blackbird, with a crimson beak and a large white spot on each wing; a red dove with a white head; a yellow and black spotted plover (Charadrius pluvialis orientalis), precisely resembling the British golden plover; a species of flycatcher (Myiagra azurea); and a bird closely resembling a hen chaffinch (? Munia topela).

This interesting assemblage of birds was evidently but a few of the numbers blown off the land (probably Formosa) by the force of a moderately strong north-east wind, and of them, many would perish in the sea, a few would find relief and restoration in passing ships, and without doubt some would reach Pratas Island, and finding means of subsistence would take up their residence there, and be jotted down in the Avi-fauna of the next observer.

Chapter III. Formosa. Ta-kau-con, and the Pescadores Island.

[P. 35] Character of Native Race -- Dutch Occupation -- Treaty Ports -- East Coast -- Arrive at Ta-kau -- Lagoon -- Apes' Hill -- Land Crabs -- Leaping Fishes -- Walk in the Country -- Water Buffaloes -- Padi Birds -- Village of Pi-hi-kun -- Chinese Ladies -- The Pescadores -- Ponghou -- Makung -- Cheap Provisions -- Cuttle Fish -- Absence of Trees and Birds -- The Rocks -- Visit the Mandarin -- Photography -- Wreckers.

The Chinese do not appear to have been acquainted with the existence of the Island of Formosa, or Tai-wan, until the year 1431 A.D., a circumstance which does not speak much for the naval enterprise of a people who had possessed the mariner's compass for so many centuries. It was originally inhabited by a race who were described as -- the men of tall stature, very corpulent, and having a complexion between brown and yellow, who went naked during the summer -- [p. 36] without blushing, adds the Dutch chronicler: the women, of short stature, yet corpulent and strong, of a lighter complexion than the men, well dressed, and exhibiting a natural modesty. Both sexes friendly and good-natured, they would not readily cheat or steal, not treacherous like other Orientals, anxious to learn; the men, however, averse to labour, so that the women had to do all the work of the field, and the heaviest work at home. Formosa was discovered for Europe by the Portuguese, and from its pleasant aspect called by them Ilha Formoza, which name it has retained. The Dutch, however, who found the natives as above described, occupied and colonised the island, and doubtless did much good there; raised the people from a state of barbarism, educated them, and instructed them in the Christian religion. The Chinese, already conscious of the advantages of

settling in so fertile a country, treated the aborigines like dogs -- robbing and murdering them as it suited their convenience; and it is no matter of surprise, therefore, that the natives felt an attachment to the Dutch, who enforced their own laws, prohibited fighting among them, made the education of their children compulsory, and left them nothing of their own barbarous customs and laws, except the privilege of selecting their own chiefs to manage the affairs each of his own village; each chief being himself under the jurisdiction of a Dutch military officer, who, with 25 men, was stationed in every village of importance.

The aborigines of Formosa are reputed still to have a traditional reverence and regard for white men, and it is much to be regretted that so firm and benignant a rule as the Dutch seem here to have inaugurated should have been cut short by an overpowering attack of the neighbouring half-civilised Chinese.

[P. 37] Formosa is now opened up once more to western enterprise; but in a very different manner from the time when the Dutch philanthropists occupied it. It is still in the hands of the Chinese, who reserve their monopolies of some of its most important productions, such as sulphur, camphor, rice, &c. By treaty, the ports of Ta-kau in the south, and of Tam-suy and Ke-lung in the north, are open to foreign trade, and a few merchants have settled in these places. The capital of the island, however, Tai-wan-foo, being situated nearly three miles inland, up a muddy and shallow river, is very unsuited for commerce or for residence, and although our consul, Mr. Swinhoe, who has done much for the zoology of the island during his residence in it, first planted his consular flag here, he soon found it desirable to remove it to Ta-kau. But still the resources of the country are undeveloped, and it yet remains for some enterprising nation to do justice to Formosa. Chinese policy only stunts the growth of its commerce, and, dog-in-the-manger like, most imperfectly and insufficiently does that which it will not allow any one else to share in, except at a disadvantage.

The western side of Formosa only is occupied by the Chinese. The eastern rises for the most part into a range of lofty mountains, in the recesses of which still dwell the aborigines, with here and there perhaps a small community of Chinese, who are more or less in awe of their savage neighbours. This side, too, is very rarely visited by Europeans, being almost devoid of harbours, and the coast inhospitable and dangerous. The only harbour, in fact, upon the east coast is that of Sau-o bay, concerning which more will be said in another chapter.

This interesting region we were now approaching, with the [p. 38] probability of spending some weeks in visiting its various ports; and on the 6th May the "Serpent" arrived off Ta-kau-con, in the south-eastern corner of the island.

The harbour is so small, and the entrance so narrow, that we did not attempt to take the ship in, but contented ourselves with anchoring outside, where heavy rollers, the result of the recent typhoon, were setting in from the south-west. Several

catamarans -- mere rafts of bamboos, on which a single Chinaman stands and rows -- came off with vegetables and fruit, presenting a curious appearance, for not only were they entirely lost to sight when in the trough of the sea, but even when borne up on the crest of the wave the rower seemed to be standing upon the water itself.

The aspect of Ta-kau from the anchorage was striking and interesting. North of the harbour was Apes' Hill, consisting of a double truncated elevation, the higher plateau reaching 1120 feet -- and, southwards, the Saracen cliffs, a long line of low perpendicular rocks, upon which a few cycads were growing. Between these elevations was the narrow entrance to the harbour, within which could be seen the yards of several square-rigged vessels mounting Bremen colours, while behind all was a magnificent range of mountains in the distance -- a portion of that chain which traverses the island of Formosa from north to south -- whose slopes and base are the abodes of numberless species of deer, wild cats, pheasants, &c., and which formerly had the reputation of harbouring tigers also. But we have much to learn yet of the natural productions of the island; and but few Europeans have penetrated even to the foot of these hills, about which we know but little more now than we did when the forgeries of Psalmanazar gulled a susceptible public.

[P. 39] On rowing into the harbour, the numerous picturesque junks anchored within gave it a foreign appearance, very striking to one who, like myself, now entered a Chinese port for the first time. On either side houses, including some in European style, were scattered -- the real Chinese town forming a long, narrow, dirty street, similar in character to those which I shall have occasion to describe in other parts of Formosa. It is situated directly on the shores of the harbour immediately on entering, and is inhabited by a very low and poor coolie class of Chinese. The European community at Ta-kau is very small, consisting of a vice-consul, one or two English merchants, two medical gentlemen -- one of whom, Dr. Maxwell, is a medical missionary -- and a commissioner of the Imperial customs.

The harbour opens into an extensive lagoon which runs some miles inland, and is separated from the sea by a narrow strip of slightly-elevated land, which serves as a mole. From the hills in the neighborhood of the harbour this lagoon may be seen stretching away through mangrove-covered flats, among which boats could be seen threading their way. Beyond this, a wide and fertile plain of alluvial soil, covered with padi fields and other cultivation, swept up to the base of the magnificent mountains already mentioned, and was dotted with villages, clumps of trees, and other elements of a luxuriant landscape; while out to seaward the small island of Lambay broke the monotony of the view in that direction.

Apes' Hill is so called from the fact that a (tailed) species of monkey is occasionally seen upon certain parts of it; but as far as I could learn, they are difficult to meet with, though I was assured that they really existed. I ascended to the summit, which was very rugged, the side next the sea [p. 40] being rocky and precipitous; and as

it was this part which the monkeys were said chiefly to inhabit, I did my best to get a sight of them. Lying flat down, therefore, I looked over the edge, but neither the dislodgment of stones nor the clapping of my hands succeeded in eliciting any traces of the animals, which, in fact, appear to be almost as mythical and rarely seen as the true apes on the rock of Gibraltar. While thus engaged, a loud rush near my head made me retreat from my insecure position, and on looking up I found that a number of large kites (Milvus govinda), which were always hovering about the coast in search of garbage, had assembled overhead, and one of them had made a swoop near me, probably to reconnoitre the unusual object.

The lower part of Apes' Hill consists of rugged coral blocks, embedded among which I obtained a few recent shells. The blocks are thrown up in a very loose manner, but for the most part covered with bushes and herbage, even up to the summit. Abundance of a species of Euphorbia, and stunted bushes of guava (Psidium) grew upon the sloping sides, while near the summit appeared the characteristic cycads, which were now in flower, and might easily have been mistaken at a distance for small palms. Among them flew in considerable numbers a large, red-winged orthopterous insect (Gryllus), and at the summit was a small green species, with the head singularly elongated and produced in front, belonging to the genus Tryxalis, which seems largely represented in the island.

Upon the shores of the lagoon was an excellent spot for watching the habits of the land crabs (Gelasimi), which marched about in a serio-comic manner amid their holes; each one as it cautiously moved along held up in front of its eyes its single large and delicately-tinted claw, with an [p. 41] expression half of defiance, half of defence. Prowling thus about, probably in search of food, they were readily alarmed, and retired to their holes, which generally seemed too small for them, so that it took a little time for them to accommodate themselves to their narrow dimensions. If closely pursued, therefore, they were easily captured. I carried one to some distance, and placed it at the mouth of another hole, down which it immediately dived and disappeared, and although I waited a considerable time in the expectation that the tenant of the hole would drive it out and show some displeasure at the intrusion, nothing of the kind occurred.

Another singular animal which I saw here for the first time, but which I found numerous on many subsequent occasions, was the leaping fish, Boleophthalmus Boddaertii. These curious salamandrine-looking creatures, for it was difficult at first to say which they were, contrived to elude pursuit in the most active and provoking manner. Each step in advance caused them to jump, jump, in a rapid and agile manner from almost under my feet -- for when at rest they were scarcely distinguishable from the mud on which they were lying, and to which they admirably assimilated in colour -- but on the least alarm they would make a series of leaps, which rapidly brought them down to the margin of the water, and from which it was next to impossible to cut them off. They are wedge-shaped in form, usually about 3 or 4 in. long, with flat pointed tails

and broad heads, upon which is situated a pair of prominent eyes. They have been called by sailors "Jumping Johnnies," and are by no means confined to muddy or sandy shores, for I have found them equally among smooth rocky places, up which they climb with great skill, by a series of leaps, wriggling and curving the tail at each leap in a contrary [p. 42] direction, that is, to right and left alternately. Their leaps are effected by means of their curiously-bent ventral fins, which look something like a pair of hands placed immediately behind the head, and as they always make straight for the water and *double* with great agility, it is scarcely possible to capture them excepting with a net.

The vicinity of Ta-kau is fertile and highly cultivated, and the country populous and interesting. The lagoon has the appearance of a broad river, with mangrove-bordered creeks and numerous large arms, and at its head is a muddy expanse, given up to hosts of land crabs (Gelasimi), whose myriad holes give forth a crackling sound as their tenants withdraw themselves on the approach of footsteps. Beyond this, padi fields cover the greater part of the country, among which numerous villages stand like habitable spots of *terra firma* amidst a marsh. The padi fields are for the most part rectangular, with narrow ridges between them, which afford a precarious footing, and render it necessary to keep a careful eye upon one's footsteps; for the rice grows up from pools of muddy water, into which an indiscreet step would at once plunge the incautious pedestrian. Upon these waters, numerous aquatic insects (Hydrometrae and Gyrini), of species indistinguishable at first sight from those in English ponds, were sporting; and many large shells, chiefly Paludinae (P. aethiops and P. chinensis), were floating among the stalks of the rice. Strange as it may appear, the aspect of the scene forcibly reminded one of English cornfields in spring -- the green rice hiding the unsightly marshy aspect of the country.

Nestling amid the trees, among which bananas and bamboos held a conspicuous place, were numerous villages, the houses of which were usually plastered over with mud. Beside [p. 43] them were small cottage gardens, and plantations of sweet potato (Convolvulus batatas). From their villages groups of curious natives came out to see us; noisy dogs rushed out, barking, and ran away growling; and great hollow-backed pigs, of the real Chinese breed, grunted lazily from the mire in which they were wallowing; while here and there, in a secluded spot, was tethered a water buffalo (Bos bubalus), one of those unsightly brutes which represent the domestic cattle of China, his black hide plastered with mud half dried, and his neck stretched out with a stupid and frightened expression. No sooner did we appear in sight than, in many instances, the animal, clever enough to recognise strangers, began to caper about, and, violently snapping the cord which was fastened to a ring through his nose, went crashing through the bamboo fences into the plantations, with the effect of quickly bringing out his wrathful master in hot pursuit. In some spots we came to a herd of these animals bathing. They delight in water, and in wallowing where the mud is deepest and softest; and they require no persuasion to go into a pond, however thick and dirty, but, laying themselves down, they remain with their noses just above the water for any length of time. Such herds were usually under the charge of two or three lads; and the animals,

on seeing us approach, immediately began to stretch out their necks, regarding us with a stupidly vicious stare, as though they would immediately quit the water and rush at us. The former they would probably have done had we not been very circumspect, and their guardians were in great fear of their rushing out and being dispersed; but there was little chance of their running at us, for they would more probably have stampeded in the opposite direction.

[P. 44] The most common bird was undoubtedly the Padi bird, a species of heron (Ardea prasinosceles), which was constantly flying over the padi, or rice-fields; and it was also accompanied by a pretty white egret (Herodias garzetta); but on the banks of a small lake a cluster of trees was full of these birds, whose colours were relieved by two other species, one (Buphus coromandus), which possessed a number of rich buff feathers; while the other was of the ash grey of our ordinary heron (Ardea cinerea), which is here common. Vast numbers of these birds, all mingled together in the trees, were set off by the thick green foliage, and had a very pretty effect. They kept up a loud and constant chatter, and seemed all disputing with one another for the possession of nesting-places. As we returned to Ta-kau we captured a splendid night heron (Nycticorax griseus), a truly nocturnal bird, but the exigencies of whose young family required it to be abroad in the day at the season; and among the smaller birds, the most notable were two species of flycatcher -- one, Myiagra azurea; and the other, Ixos Sinensis. Several pretty doves nestled up in the trees, among which I noticed Turtur humilis by its peculiar coo; and on the lagoon a summer-snipe (Totanus) afforded practice for our guns.

At the village of Pi-hi-kun we halted to refresh, and were soon surrounded by an admiring group of villagers, who turned out to gaze at us, and crowded round with the greatest curiosity to see the foreigners eat, and to examine all their accoutrements. The gun, powder-flask, and shot-case came in for their share of admiration, which was at its height when we brought down a Padi bird as it flew over the village. Our clothes, their texture and cut, were curiously inspected, and all the contents of our pockets were turned out, the old men being as inquisitive as the youngest, but all civil and [p. 45] good-humoured. It was my telescope, however, which caused the greatest *furore,* and all in turn were treated to a peep through it. Not in the least degree backward was the irrepressible boy, who, in Formosa as everywhere else, maintained his character for impudence and inquisitiveness. We became very popular, and water was brought us in a gourd, and pine-apples produced, which assisted in extinguishing hunger and thirst at the same time; and when at length we left the place we were escorted out of the village by a crowd of *gamins*, to whom the day's excitement was something to be talked about for a long time after. The girls and young women, however, were timid and backward, sometimes venturing into the skirts of the crowd to get a stolen look at us, but immediately retreating to a safe distance if they saw that they were observed.

The women of the better class in this part of Formosa dress in the most brilliant colours, and numerous parties which we met walking out in the cool of the evening

were amusing impersonations of the Chinese pictures and figures long familiar to us. The ladies, of whom, with children, these parties usually consisted, were, like all the females of Formosa, small-footed, and supported their difficult and tottering steps with a long walking-stick. Their dresses, consisting of a wide-sleeved tunic, cut in the formal style universal among Chinese ladies, were of the brightest scarlet, blue, or orange, embroidered with black, which contrasted well with the colour; and their full trousers were of some other equally showy material. In their hair, dressed in the elaborate Chinese tea-pot fashion, they wore artificial flowers made of the pith of the rice-paper plant, of Amoy manufacture; and as they walked painfully along, with the hobbling gait peculiar to their hoof-like feet, their figures swaying to [p. 46] and fro, and their arms more or less outstretched to balance themselves, they had, to us, a most grotesque appearance -- but in Chinese eyes the acme of grace and loveliness, which they figuratively liken to the waving of willows agitated by the breeze.

After three or four days' stay at Ta-kau-con, we steered towards the Pescadores islands, a group between Formosa and the mainland, sometimes called the Ponghou Archipelago. This cluster consists of 21 inhabited islands besides several uninhabited rocks, lying between the parallels of 23° and 24° N., and are included with Formosa in the Chinese province of Fo-kien. A strong breeze kept us rolling tremendously as we crossed the channel, and it was a matter of congratulation to have reached the outlying rocks of Three Island and Round Island, and to get under the lee of Ponghou, the principal island of the group, along which we coasted more quietly. This gave me, moreover, an opportunity of examining the remarkable structure of the neighbouring members of this group, which all presented a peculiar flat and truncated appearance. This was particularly observable in Table and Tablet Islands, both of which consisted of flat tables, about 200 feet high, supported above upon well marked basaltic columns, and sloping from these down to the water's edge, just as is seen on the Antrim coast. So also the large island of Ponghou exhibited a columnar structure in several places, often with a sandy beach at its base; and on approaching Pong Point, the south-western promontory, I observed the columns to be broken off close down upon the beach, forming a causeway in two places, though on a smaller scale than at the Giant's Causeway. The absence of trees from all the islands gives them a rather dreary aspect. We entered Ponghou harbour [p. 47] and anchored near the town of Makung, the chief town of the archipelago, and were immediately saluted with half-a-dozen guns fired by some junks lying farther in the bay, though with what object we could not tell. Two or three boats presently came alongside, with persons of a very civilized and decent appearance, and by no means the wild-looking and half-clad fellows who might have been expected to inhabit such a remote place. We found it difficult to communicate with them, however, for although a race of Chinese, our China boys could not readily understand their dialect, nor could they make themselves understood. We landed shortly after at a large old Dutch fort, which once commanded the harbour, and in which a number of rusty guns were still lying in the ruined embrasures. The beach was strewn with numerous worn blocks of coral, and several fishermen were living under their boats, which they turn up at night, to shelter them against the wind.

We were very soon surrounded by an admiring crowd, composed principally of the irrepressible boys, for although some men followed us with them, no women were seen. The men and boys usually wore blue turbans, and the women, when we saw them, had universally small bandaged feet, and wore bunches of artificial flowers in their hair, as we had observed them to do at Ta-kau -- ornaments imported from the opposite city of Amoy. The people generally struck us as being decently clothed, and presented a marked contrast to the squalor and dirt everywhere visible among those we had hitherto seen in Formosa. The boys also were usually neatly dressed, and there was a something in their behaviour which gave an impression of good breeding, such as we were surprised to meet with in this isolated region. We entered a boys' school at the outskirts [p. 48] of the town, where every one, from the schoolmaster to the smallest boys, seemed to enjoy the novelty of the visit, and to wish to show us attention. They exhibited their books, and, for a few cents, even willingly sold some of them, in which the youngsters had been drawing heroes and idols, in all the grotesque attitudes in which the Chinese appear to delight. Followed by an attendant crowd, we walked through the streets of the town, which were usually narrow, and covered over with a screen of rattans or bamboos, which formed an effectual shelter from the sun's direct rays, and kept the street cool, as is the fashion at Suez. The shops were spacious and cleanly, and the articles exposed for sale very various, but all of Chinese manufacture, and chiefly from Amoy. No European goods were visible; indeed the only article of foreign make which we encountered was some red serge. The houses are nearly all built of blocks of coral cemented together, and the tiled roofs are peculiarly curved in the characteristic Chinese manner. In the outskirts we occasionally saw women and children sitting at the doors; but as soon as they caught sight of us at the end of the street, they would hastily jump up and rush alarmedly in doors, and bar themselves in -- though sometimes curiosity seemed to get the better of their timidity, and they might be seen peeping at us from behind their grass screens. If a girl ventured into the skirts of the crowd which surrounded us, a look was sufficient to drive her away; the moment our eyes met, she would sidle off confusedly, and get out of sight; children scampered away screaming whenever we appeared; and the dogs invariably singled us out, barked sullenly, and ran off to a safe distance -- their exit being much hastened by the sight of a stick, for they are the most cowardly of brutes, and in this particular town often frightfully [p. 49] mangy and wretched-looking, much more fit to be shot than to be wandering about the streets.

Provisions were exceedingly cheap at Makung. When Her Majesty's ship "Swallow" visited the harbour recently, eggs were purchased at the rate of 300 for the dollar, and a calf cost but one dollar. When a foraging party from our ship went ashore, they purchased a calf for two dollars, and eggs at one dollar the 150, and other things in proportion. A large basket of the ground-nuts (Arachis hypogaea), a very favourite article of food in China, all ready husked, cost only 60 cents, and four dollars the picul (133 1/3 lbs.) were asked for the very best rice.

Beyond the town, the harbour terminates in a broad, extensive, shallow bay, which at low water affords employment to a large number of people, who wade over it in search of shell-fish and other articles, which they consume largely in their diet. Women are principally employed in this business, both here and elsewhere, and they carry with them a basket, and a little iron hammer and pick, with which they pull out the animal from the narrowest crevices of the rocks. In some parts of the town, large heaps of shells belonging to the subgenus Modulus were to be seen, forming incipient kitchen-middens, and illustrating at once the chief molluscs of the bay, and an article of considerable consumption by the people. Haliotides (sea-ears) are also sold in the market place, as well as cuttle-fish, both fresh and dried, all of which enter into their dietary. We obtained one of these large cuttles, or more properly calamaries (Loligo), with the intention of trying its esculent qualities; but whether the fault of the cooking or otherwise, even though curried, we did not care to repeat the trial. When quite fresh, the large maculae, and fine spots on the [p. 50] surface, were in a constant state of change, the colour coming and going, from alternate contraction and expansion of the pigment vesicles, without any direct irritation. When pale, the colour could be made to re-appear by drawing the finger along the skin, but the power of contraction appeared to be lost when the vesicles had been cut through. As it lay on the table during the night, I cast my eye upon it, and observed that it was luminous -- a glow of whitish light irregularly illuminating its whole surface. At this time it was quite dry, and the luminous appearance was not altered by passing my finger over it.

On enquiring for shells, a good many were by degrees brought to us, chiefly consisting of common cowries and harps, and olives of several large and handsome varieties of Oliva erythrostoma; but nothing else could we obtain here, though, if we had remained longer, it would perhaps have been possible to have procured others.

All these islands appear to be very destitute of trees; and standing on the high ground of Observation Island, on the opposite side of the harbour, I looked in every direction for a tree or bush, in vain. Although, however, the volcanic structure of the island is not favourable to the growth of wood, many very pretty flowers abound, the commonest of which is a species of Cassia. Probably on account of the deficiency of wood, very few birds were to be seen. A few terns flew about the harbour, and some summer snipes (Totanus) were seen occasionally. The commonest bird was the tree-sparrow (Passer montanus), abundant everywhere in the East, where it takes the place of the common sparrow of Great Britain (P. domesticus); and besides these, I observed a small shrike, and a number of larks (Alauda coelivox) upon Observation Island, whose habit and character [p. 51] of song were precisely similar to those of the skylark of our own country.

The rocks of Makung Harbour, which I had an opportunity of examining, were basaltic in formation, washed smooth by the waves, and in some spots exhibiting in section the columnar structure. No seaweeds grew on these rocks, with the sole exception of the peacock-tail (Padina), which was abundant, nor could I meet with any

echinoderms (starfishes, &c.). Indeed, the coast was extremely barren, and produced little else than small Paguri (or hermits) in shells of Murex, Litorina, &c., small Chitons and Patallae. Ligiae ran over the rocks, gleaming with rich metallic blue, and darkening them in crowds, here as nearly everywhere; and I really believe that these are the most abundant of all crustaceans, at all events of those seen. The only animal of interest I met with was a very handsome Doris, of a deep blue colour, spotted with yellow, and with branchiae and tentacles of a bright vermilion. This richly-coloured species may be the Doris Barnardi of Kelaart (MS.). Under the stones were numerous small porcelain crabs (P. platycheles). An attempt to dredge in the bay was only rewarded with bags of mud containing a few broken bivalves.

Before quitting Makung, we paid a visit to the chief Mandarin of the place, but were not successful in seeing him at his *yá-mun*. The appearance of a foreign man-of-war in the harbour was embarrassing to the official mind, and from its rarity was somewhat alarming, inasmuch as the poor Mandarin probably was unable to conceive of such a circumstance without accompanying demands, or that it could possibly happen without any further reference to him than a mere polite visit of ceremony. He had, therefore, given out that he had gone to Ta-kau, with which answer we [p. 52] had, of course, to be satisfied; but the lad who guided us to his house had probably a pretty correct appreciation of the *situation*, when he grinningly hinted, "Mandoli too muchee fear."

After three days' stay we quitted Makung, our chief engineer, Mr. Sutton, an excellent photographer, having taken some views in the town on the morning of our departure. On this occasion the crowd was with difficulty kept off from the apparatus, their extreme curiosity proving rather inconvenient. One man, while a picture was being developed, and attention temporarily withdrawn, furtively drank the contents of the bottle of glacial acetic acid, and it was well for him it was not something even more deleterious. Another, who was more impudent than most of his neighbours, accepted the challenge to be painted with the nitrate of silver solution. Accordingly he received a moustache, beard, rings around his eyes, &c., which were beginning to darken in the sunlight as we left the scene, greatly amused at the surprise which awaited our forward friend when the full effects of the solution should become developed; but, unfortunately, we had no opportunity of seeing him in his altered aspect, though we may imagine it would be a source of no small embarrassment to him, and amusement to his pitiless neighbours.

A few months subsequent to our visit to the Pescadores, two English ships were wrecked in the neighbourhood. The first of these, as soon as she was observed to be upon a reef, was surrounded by 30 boats, and some 300 natives boarded her and looted the ship of every movable article. They do not appear to have offered any personal molestation to the Europeans, who were even accommodated with the shelter of a joss-house; but their goods were taken as something [p. 53] which had fallen to the plunderers by right. In the second case also, the European crew were stripped and

robbed; but, otherwise, the intruders showed an inclination, provided good remuneration were offered, to assist the captain out of his difficulties. Not everywhere on the Chinese coast is so much forbearance shown as by these islanders.

Chapter IV. Formosa (continued) -- Tam-suy.

Towing Net in Formosa Channel -- Pterosoma -- Firola -- Sagitta -- Atlanta -- Glaucus -- Alima -- Phyllosoma, or glass-crab -- Cerapus -- Hyalaea -- West Coast of Formosa -- Fort Zeelandia -- Notonectae -- Arrive at Tam-suy -- The Harbour -- Boulder Clay -- Chinese Graves -- Rice-paper Plant -- Bamboo -- The Town -- People -- Rice Embargo -- Visit to Mbangka -- Camphor Monopoly -- Visit the Chief Mandarin -- Return Visit -- Queen's Birthday.

[P. 54] At daybreak on May 15 we weighed and stood out of the harbour of Makung, first directing our course towards a supposed shoal, marked doubtful on the chart, which we did not, however, succeed in discovering. But the appearances were quite sufficient to deceive the inexperienced -- such as long lines of ripple caused by the rapid north and south tide of the channel, and drift dust in the distance looking like breakers. The mast-head man also reported shoal water; but it proved to be a fallacious appearance caused by the tide rips, which ran so strong that the towing-net could not be kept out except at slack water.

And here I may refer to several singular marine animals, discovered by the towing-net in the Formosa channel, which proved a rich locality for strange and rare forms. Among them was the Pterosoma (Pt. plana), a transparent, delicately-tinted winged animal, thick and gelatinous, and almost invisible in the water. It belongs to a class of mollusks known to naturalists as Heteropods, oceanic animals of [p. 55] anomalous forms, with the foot variously modified for swimming. The Pterosoma was established as a genus by Lesson, upon a species he found swimming in the vicinity of New Guinea; but either the drawings of his animal are very badly executed in all the books, or the one found in my net must be a second species, for there is but little resemblance between them. Another delicate animal of the same class was the Firola, a transparent creature, with a long proboscis, and swimming by means of a well-developed fin in the lower part of its body. A third was still more curious -- an elongated, transparent body, without eyes or tentacles, but furnished with two pairs of fins and a fish-like tail, the whole body like a minute arrow, and hence called Sagitta. It darts through the water by sudden and instantaneous jerks, during which it is lost to view for a moment. So transparent is the body that the whole internal organisation may easily be observed, and the circulation of granules, upwards (towards the head), in the neighbourhood of the tail on either side [of] the body, and in the middle downwards towards the tail. This animal is referred by Prof. Huxley to the articulate division of animals. Another of these nucleobranchs, as they are termed, because their respiratory and digestive organs form a kind of nucleus on the posterior part of the back, was the pretty little curly-shelled Atlanta -- shell and animal equally transparent,

the latter with eyes and tentacles, and moving actively by means of a fan-shaped fin. All these delicate oceanic animals have a remarkable range, being found for the most part both in the Atlantic and Indian Oceans, as well as in the Mediterranean Sea.

Only once did I meet with the little purple Glaucus, an oceanic nudibranch, of which so much has been written. This sea-lizard, as it has been called, soft and fragile as it [p. 56] is, is a very tyrant over animals beautiful and delicate as itself, and the pretty blue Porpitae are the victims. But as this was rare, so the glass-like crustacean, Alima hyalina, was common in the net -- lovely forms, whose carapace seemed carved from the purest crystal, with an elegance of sculpturing and sharpness of outline that could not be surpassed, -- perishable animals, but which, while they remained alive, were active in the water. The only spots of colour in their bodies were their two eyes, mounted on long stalks, and giving out a rich golden-green glow, which was positively luminous. Almost equally transparent were the glass-crabs (Phyllosoma), whose flat, leaf-like bodies and long branched legs seemed as though made of fine plates of clear mica. These nocturnal oceanic animals (for they never appear in the net by day) are, however, very passive and quiet, and seldom show any signs of life. It is not improbable that they are larval forms of some possibly altogether different beings.

To find caddis-worms in the towing-net seemed remarkable; but small worm-like crustacea (Cerapus), furnished with large antennae, and living in tubes or cases, were not unfrequently met with. These little creatures have usually their head and foremost legs peeping out of their case, which seems to be just large enough for the body; but alarm it, and it vanishes within, re-appearing immediately, head first, at the other side, so that one can hardly be persuaded that it has not two heads. Although some were minute, others were of considerable size, and much larger than those usually described. More than once, Hyalaeas, and other graceful Pteropods, were captured; but one of these, probably the Hyalaea tridentata of Lamarck, presented appearances such as I have nowhere seen described. When first [p. 57] taken, the keeled lower angles of the globular shell showed nothing worthy of remark, the appendages were small and contracted; but gradually they became spread out to their full size, and became large, oval, semi-transparent leaves of a light green colour, exceeding in length all the rest of the body, now hanging straight down, and now more divergent. The animal could contract them at pleasure, and in a moment spread them out as before. The shell itself was tinted with rich brown; and it appeared to have three pairs of fins, the largest and uppermost brown, a smaller pair of a reddish tinge, and a third pair transparent and projecting somewhat backward over the convex side of the shell. The edges of the wings (or fins) and the points of union of the green leaf-like expansions to the other parts of the body, were of so delicate a structure as to be invisible, except on close and careful inspection. This animal swam rapidly in a horizontal direction, and kept itself floating on the surface of the water by a butterfly-like movement of the fins; but when at rest, it kept them folded over the convex side of the shell.

The whole west coast of Formosa, between Ta-kau in the south-west and Tam-suy in the north, is very flat, consisting for the most part of low alluvial plains, with no conspicuous elevations. The mountain range which culminates in Mount Morrison, and renders the east coast harbourless by its near approach to the sea, nowhere comes near the western side. As we advance northward from Apes' Hill, the coast becomes low and level; little flat islets appear at intervals, which are seen to be connected by sand-banks on a nearer approach. The capital, Tai-wan-fu, not many miles above Ta-kau, is invisible from the sea, being situated some two or three miles up a muddy river; at its port, however, 16 large junks [p. 58] and a square-rigged Bremen vessel, as well as numerous fishing-boats lay at anchor. Near the mouth of this river also are the ruins of an old Dutch fort on the beach, celebrated in the annals of the island as Fort Zeelandia, and more particularly in connexion with the tragical episode which ended the Dutch occupation in 1661. Formosa, under its enterprising colonists, had reached a political and social condition far superior to that which it now enjoys, and an attachment had sprung up between the natives and their foreign rulers; but this very prosperity excited the cupidity of Kok-singa, a renowned piratical chief, who, in May, 1661, appeared with a fleet and force of 25,000 men. The Dutch concentrated themselves in Fort Zeelandia, while hundreds of the settlers fell victims to the curel invader, whose descent was sudden and unexpected. Finding that the besieged were determined to hold out to the last extremity, the pirate became exasperated and would listen to no terms; meanwhile massacring with cruel tortures hundreds of Dutch prisoners who had fallen into his hands, after which the corpses were stripped and buried in heaps -- the women being distributed among the officers and men of his force. The little garrison at length was compelled to capitulate, and the Dutch were for ever expelled from the island; while the natives, who were in a fair way of being civilised and Christianised, have, meanwhile, relapsed into their primitive barbarism. The devotion of the Rev. Mr. Hambroek, a minister of the Dutch reformed church, who was sent by Kok-singa to make terms with the besieged, is still on record -- a devotion worthy of a Regulus, and bearing a close analogy to that old tale of Carthage.

North of Zeelandia is Kok-si-kon, formerly a port, but now closed up; and beyond this a long, low, sandy beach, [p. 59] upon which people could be seen walking, or sometimes sitting in groups to watch us; nets hanging up, with here and there a long, low hut; and after dark, a number of lights, having all the appearance of a row of gas lamps. Along all this low coast a singular aërial misty effect was observable, which appeared to arise from a lagoon behind the sandy beach. Everything seemed enlarged; men, passing by, seemed "as trees walking;" little villages appeared like large towns of stone houses, until we approached nearer, when they dwindled down to mere collections of huts. It was a kind of mirage arising from irregular refraction. In Gilim Bay 30 junks lay at anchor.

The only place where hills approach this coast is in lat. 24° 15', where long sloping shores, highly cultivated, thickly populated, and dotted with numerous villages, skirt the ranges of high hills rising about two or three miles inland, which are

often intersected by horizontal valleys of denudation, affording long and pretty vistas; the lofty mountains of the Morrison range affording a picturesque background to the whole. As we were passing this part of the coast towards evening, the cabin table became covered with small water-boatmen (Notonectae, of the restricted genus Corixa), freshwater insects, which must either have made an unwonted flight out to sea, or have been washed off the land by the embouchure of some river which here joined the channel. They flew about the cabin and round the lamp like moths, and having placed some in a basin of salt water which happened to be upon the table, they swam merrily; but they were all dead in the morning. It had been a beautiful calm day, but in the evening a breeze sprung up along the coast.

At early morning on May 18th we were off the harbour of [p. 60] Tam-suy, which, like that of Ta-kau, is well pointed out by natural landmarks on either side. Two lofty and picturesque hills render it very conspicuous, that on the north called Tai-tun, which forms an imposing ridge, rising to the height of 2,800 feet; and that on the south side, known as Kwan-yin, and having two prominent peaks, attaining an elevation of 1,720 and 1,240 feet respectively. We were soon boarded by a Chinese pilot, who was anxious to take us in, and who magnified the dangers of crossing the bar without his assistance; but our captain knowing something of Chinese character, was quite aware that the pilot was as likely to run us ashore as not, and preferred trusting to his own experience and skill. It being low-water we rowed into the harbour, reconnoitring the bar as we crossed, and proving its practicability; but, meanwhile, a breeze sprung up, and a heavy sea broke over it, while a thick haze obscured the ship and shut it out of view. An attempt to recross the bar in the boat proved unsuccessful, and we were fain to remain on shore, while the ship was forced to put to sea and stand out till morning. Our rockets and blue lights that night were unanswered, and we were therefore glad to see with the morning light our vessel once more in the offing; we speedily rejoined her, and at high-tide crossed the bar and entered the harbour, much to the confusion of the pilot, who soon after came on board and offered his services in the new character of *compradore*.

The town of Tam-suy, or as it appears to be otherwise called, Hoo-wei, is situated upon the right bank of the harbour. From land to land at the entrance is just half a mile, but a considerable spit of sand diminishes it by more than one half. Within the harbour, however, it rapidly increases to three-quarters of a mile, and even a mile in [p. 61] width, affording good anchorage for large vessels. Immediately upon the left-hand on entering, there is a small Chinese fort; and half a mile higher are the ruins of an old Dutch casemate -- a square, red-brick building, once no doubt of considerable strength, and elevated 50 or 60 ft. above the water's edge.

This elevated right bank, upon which the town stands, presents very remarkable features. It rises in an undulating manner for about 100 ft., and is entirely composed of alluvial clay, containing a vast number of boulders of stone. These boulders are of the most various sizes, from such as can be easily lifted by the hand, to large blocks of 20 ft.

in circumference. They are also of very varied forms -- some being round and smooth, and evidently more or less rolled; while others are quite angular, and have little or no appearance of having been water-worn. I carefully examined many of these blocks to see if I could discover any traces of striation which could be attributed to glacial action, but although I met with some suspicious markings, I could not satisfy myself that they were scored by the agency of ice. Moreover, there was no marked difference in the various boulders as to their lithological character, but to all appearance they were, with little exception, formed of the ordinary pebble green-stone.

This alluvial soil is very fertile, and the undulatory character of the ground gives considerable picturesqueness to the neighborhood of Tam-suy. Houses are scattered about on the hill-sides, and a large amphitheatre just outside the town forms a spacious and well-filled burial-ground, consisting of an immense assemblage of the characteristic forms of Chinese graves. These are mostly of the horse-shoe form, or rather omega-shaped, and vary in elaborate and complicated [p. 62] structure according to the position of the occupant. The ordinary merchant has a simple tomb, with a rectangular stone tablet in the centre, inscribed with Chinese characters in red and black; while the tombs of the Mandarins are often extensive structures, in which the limbs of the omega are enlarged into fantastic and elaborate copings of stone, ornamented with statues and carvings. The poor are satisfied with a simple mound and small sculptured headstone, or even less; though such is the veneration for ancestry, that the poorest usually find means to secure some memorial of their deceased parents.

Upon these hills grows in considerable abundance the Rice-paper plant (Aralia papyrifera); and from this place it is largely exported to China for the purpose of making upon the prepared paper those brilliant colourings for which the Chinese are so renowned. It is a small but handsome plant, the stem growing to the height of from 4 to 6 feet, and then giving off by long footstalks a number of handsome large digitated leaves of a dark green colour, but whitish beneath, which spread out sometimes 4 or 5 feet on either side. For a long time the source of rice-paper was a mystery, and its name indicates the common fallacy as to its origin; but an examination with the microscope could not fail to detect the large cellular substance of which it is really composed, namely, the little-altered pith of a plant. This pith is of a snowy whiteness, and occupies the whole of the cylindrical stem, more particularly at its upper portion, becoming smaller near the base. I never found any hollow centre in the pith, although it is said the Chinese themselves call it the *Tung-tsau*, or hollow plant; nor did I observe any specimens in the neighborhood of Tam-suy more than 6 feet high, although the Chinese accounts make [p. 63] it twice that height. Probably the specimens which came under my notice were young, or those which had not had the benefit of cultivation, for they were scattered sporadically upon the hill-sides. The mode of preparing the paper from this plant is by skilfully paring the previously-removed pith with a broad and sharp knife, which shaves it cleanly off in a spiral manner from the circumference to the center, at the same time preserving an equable thickness throughout. The substance is

then flattened out, cut into smooth sheets, and is ready for the reception of pigment, which can by laid on with remarkable facility and brilliancy.

But perhaps the most prominent feature of the vegetation of Tam-suy and its neighbourhood is the bamboo (Bambusa arundinacea), everywhere a striking object from its graceful feathery foliage. It lines the river's banks, forms hedges and fences, and is remarkably beautiful. At the same time it is the most useful of trees, from which almost every article and utensil is made; the small canes, and the large heavy stems alike, with little preparation, being converted into innumerable useful objects; while the split wood is utilized in a hundred ingenious ways, and there is scarcely any manufactured article into which the bamboo in some form does not enter.

The long rambling town of Tam-suy consists, for the most part, of a narrow street of shops of a poor description, paved with great cobble-stones, or else not at all, and in which pigs of all sizes, and barking dogs, dispute the passage, which, in some parts, scarcely admits of two passengers passing one another. The Vice-Consul, Mr. Gregory, resides here, as well as three or four other Europeans, either engaged in mercantile affairs, or employed in the Chinese customs. The consulate, however, is but a poor building [p. 64] for the representative of Great Britain; for the inhabitants, who are mostly of the Coolie class, and upon occasion can show themselves a turbulent set, have a prejudice, forsooth, against building houses more than one story high, and no such dwelling exists in Tam-suy.

Squalid, however, and unsightly as are the buildings of Tam-suy, there is a very pretentious joss-house or temple, in which the stone pillars, elaborately carved, represent, with considerable cleverness, fantastic dragons encircling the columns in high relief, and holding loose stone balls in their mouths. Workmen were still engaged upon these sculptures.

The people of Tam-suy are poor and meanly clad, and the same may be said of the other towns in this part of Formosa. The males usually wear nothing more than a short pair of drawers, or some substitute for them, many of the younger male children going entirely naked. The women and girls, however, are always decently clothed, very few of the female children being bare even to the waist. Bandaged or small feet are universal among them, the only exceptions being a few among the lowest of the low.

Bullocks, goats, and poultry are difficult to obtain, but pigs are abundant, though few who had an opportunity of witnessing their disgusting habits and foul feeding would care to eat them. Ducks also are plentiful.

Rice is abundantly produced in the neighborhood, as well as in other parts of Formosa, but its exportation is forbidden on pretence that no more is produced than is required for home consumption. This embargo was issued by the Tao-tai of Tai-wan in 1864; but inasmuch as the approbation of the foreign ministers of Pekin had not been previously obtained, it appears to have been illegal. Moreover, [p. 65] the Chinese

authorities winked at the exportation by natives, and junks laden with it left Tai-wan in spite of the embargo, greatly, no doubt, to the advantage of the mandarins. The excuse that no more was produced than was required was simply a subterfuge; and the evil effects to the commerce of the island are evident from the fact, that it was roughly estimated that the direct loss with regard to Ta-kau alone, in commissions, was equivalent to 63,000 dollars per annum as long as the prohibition lasted. Although, however, it extended to all Formosa, it was enforced with far less stringency at Tam-suy than in the other ports.

A Hamburg merchant, Mr. Millisch, residing at Mbang-ka, or Bang-ka, situated nine or ten miles up the right branch of the Tam-suy river, having invited us to visit him there, we took the opportunity of seeing a town which, being the chief of the Hoo-wei district, was more considerable and interesting than Tam-suy. Mr. Millisch was the only European resident there, and occupied a handsome two-storied house, the only one I observed in this part of Formosa. We accordingly went up with the tide in the captain's gig aided by a breeze from the sea. For the first four miles the stream was of varying width, averaging about a mile, and running in a south-easterly direction at the foot of the Kwang-yin hills, which, seen in the light of a western sun, had a remarkably piled-up or cone-in-cone appearance, and at the base are perforated with caverns. On the right bank a cultivated plain stretched to the foot of the Tai-tun hills, which expanded to the eastward as we proceeded. At length, at a village called Kan-tow, the stream divided, the left branch continuing its course across the island in an easterly direction, while the right, which we followed, took a south-easterly course through a flat country, in which rice, sugar, [p. 66] and maize are cultivated; and a straight reach of 3 1/2 miles brought us to Twa-tu-teen, a large village, where the stream trended to the south, and after another mile and a half we arrived at Mbang-ka.

This is a large town, situated on the river side, and abounding in the narrow and unsavory streets before described, one side being covered over with a kind of arcade, and the other side open, but by far the dirtier of the two, being chiefly occupied by pigs and children, both of which swarmed everywhere. Accumulations of filth lay about at the very doors of the inhabitants, and it was no unusual sight to see women adorned with bright and gaudy finery sitting within a foot or two of a pool of seething filth enough to breed a pestilence. Chairs or sedans were to be obtained here -- rickety vehicles, in one of which I perambulated the town; but in some places the corners of the streets were so narrow that it was with the utmost difficulty that my chair could be coaxed round, and then only by a series of ingenious manoeuvers.

Mbang-ka derives considerable importance from the fact that large junks can come up thus far; and one arm of the river, which again divides just above, flows from San-kop-yung, the district which produces large quantities of camphor; and here the junks are loaded with that important and valuable commodity, the source of which is the laurel (Laurus camphora). But the camphor trade is at present of little value to any one, except to those to whom the monopoly is granted by the Chinese Government.

The camphor mandarin, as he is termed, who enjoys this monopoly, pays 40,000 dollars per annum into the imperial chest for his privilege, and having obtained the camphor at the rate of about five dollars per picul of 133 1/3 lbs., he can then [p. 67] sell it for 27 dollars. One dollar for duties and some other slight expenses increase the cost, and about 10 per cent. of the camphor is lost by evaporation during the transit; for with the proverbial dogged conservatism of their nation, they insist on continuing to pack it in wood instead of stowing it in tin cases, by which contrivance it might all be saved. Still the profits are very considerable, and will probably remain in the hands of the monopolists until some enterprising European merchant shall wrest it from their hands, and open up this important trade to foreign competition.

The branch of the river which diverges above Mbang-ka from that leading to the camphor district is navigable for boats up a series of rapids to the borders of the aborigines' country.

While at Mbang-ka, Capt. Bullock having made an appointment with the chief military mandarin of the district, Ching-yung, to pay him a visit, we repaired to his ya-mun, where he received us with official formality. His residence was situated just outside the town; and our party, including Mr. Gregory, the vice-consul, having reached it, with a procession of chairs at our heels (for we preferred walking, although it was etiquette to go in chairs), we were saluted with three guns as we entered the enclosure. In this enclosure I may here mention that I observed a horse, belonging to the mandarin, of the spotted circus-kind, which seems to be most prized by the Chinese. Mr. Millisch also possessed a horse; but these two were the only horses I saw in all Formosa, though I have been informed that at Tai-wan-foo, the capital, horses are known. Having seated ourselves in the audience-chamber, tea was served in cups of egg-shell china by a number of attendants, as soon as they had [p. 68] succeeded in chasing out the ragged crowd which had curiously followed us into this *sanctum*. The mandarin was decorated with a clear blue button and peacock's feather, and appeared to be an intelligent and rather superior man of about 35 years of age. He conversed freely through the medium of Mr. Gregory, who acted as interpreter; and after having remained some 20 minutes we quitted the place with the same formalities as on entering, the mandarin having first accepted Capt. Bullock's invitation to visit the ship at Tam-suy, next day, which happened to be her Majesty's birthday.

The day following, therefore, the 24th of May, we were prepared to receive his promised visit, and to show him the manner of decorating the ship in honour of that occasion. As usual, at eight a.m., the ship was dressed out with flags, &c.; and Captain Bullock having invited the European residents to dinner, a long table was prepared on the quarterdeck, and a stage erected at one end, upon which the blue-jackets were to enact a play which they had got up among themselves. It was not, however, till nearly five o'clock that the mandarin arrived, accompanied by the subordinate mandarin of Tam-suy, his secretary, the consul's linguist, and a crowd of attendants. They seemed much pleased with everything they saw, and minutely examined all the principal

arrangements of the ship, particularly the guns; so that time drew on, and the dinner hour (half-past six) was getting very near. The Europeans began to arrive; but our Chinese friends as yet showed no signs of bringing their visit to a termination. Under these circumstances Capt. Bullock, who was quite willing that they should remain, asked them to be his guests for the evening. Chinese politeness, according to the rites, should have declined adding [p. 69] four impromptu guests to an already full table; but undisguised interest and curiosity seized upon the opportunity, and they accepted the invitation without hesitation. Mr. Gregory, the vice-consul, sat with them and acted as interpreter; and as they had their own attendants they fared as well as they could desire. They seemed to appreciate the champagne and other beverages of an English dinner, and did full justice to the viands, even using knives and forks. Dinner ended, and some speeches following, they were politely listened to; and when at length it was announced that the curtain was about to be drawn up, they still kept their seats. The play was "Therèse," a tragedy of course, for sailors always select something serious and lugubrious, the most affecting parts being, of course, those where it was most difficult to avoid hurting their feelings by a burst of laughter. The Chinese looked on to the end; and even afterwards, when some songs, sailors' hornpipes, &c., followed, they remained politely attentive; and it was only when one of the Chinese servants was forced upon the stage to sing a stave in the real falsetto, singsong, Chinese style, that they allowed their gravity to forsake them, and fairly joined in the laugh which the absurdity of the thing universally raised. Late in the evening they rose to leave, with many expressions of gratification, and three guns saluted them as they went ashore in the captain's gig.

The Tam-suy mandarin, whose name was Lim-ching-fang, wished to have invited us to a return dinner; but unfortunately our plans did not admit of longer stay, and preparations were made the following day for taking the ship round to Ke-lung.

Chapter V. Formosa (continued) -- From Tam-suy to Ke-lung.

[P. 70] The Sulphur Springs near Tam-suy; approach to them; their present condition; effects on Animal Life -- Preparations for River Voyage -- Village of Pah-chie-nah -- Arrive at Sik-kow -- Bivouac at Chuy-teng-cha -- Birds on the route -- Rapids -- Population -- Domestic Animals -- Arrive at Liang-kha -- Descent to Ke-lung -- Character of the People.

Having heard of the existence of some sulphur springs in the vicinity of Tam-suy, I was glad of an opportunity of visiting them; and accompanied by Mr. Lessler, of Tam-suy, who kindly lent me his boat for the purpose, we devoted one of the days of our stay to a journey thither. The locality of the springs is among the hills, about equidistant from Tam-suy and Mbang-ka, and we approached them by taking the left-hand branch of the river, where it divides at Kan-tow. They are highly interesting from a geological point [p. 71] of view, indicating, as they do, the existence of volcanic action near the surface in this part of Formosa -- a circumstance which we might have been led

to expect from the frequent reports of earthquakes, though none occurred while I was in the island.

These sulphur-springs are not the only springs of the kind in those parts; others are indicated at no great distance. The road to them from the spot where we left our boat ran through a beautiful and highly cultivated district. Besides numerous padi fields situated upon the hill-sides, and ingeniously irrigated by a series of platforms, down which the water flows from one to the other after the manner of the cascades of St. Cloud, a remarkable feature is an immense pineapple-plantation of many acres in extent, so that the verdure of these hills leaves one unprepared for the fact of subterranean heat finding a vent in such close proximity.

On the road we were accompanied by a number of children, who for the reward of a few cash, darted out in forays upon the coleopterous insects of the surrounding country. They brought us splendid longicorns, especially the white-spotted Cerosterna punctator, and the equally handsome Batocera Germani, the first of which we had found in some profusion on the shrubs among the rice-paper hills at Tam-suy. Perhaps the most numerous beetle was a small metallic blue Popilia, and almost equally common was a fine species of green Euchlora, among which was here and there a bronze Mimela of smaller size. Many beautiful yellow Cassidae were among them; but all partook of a Chinese character and facies.

About halfway up the ascent we crossed a stream having the character of a mountain torrent, the stones at the bottom [p. 72] of which were covered with a deep green deposit, very copious in the quieter and more sheltered spots; and upon dipping one's hand into this stream, the temperature was found to be too high to allow it to remain there. At this point it was about 130°; but higher up it could be seen steaming, notwithstanding the tropical heat of the day.

This stream does not appear to flow directly from the sulphur-springs above, but probably from some subterranean source connected with them. The channel leading down directly from the springs was quite dry, though it bore evidences of having been, comparatively recently, the theatre of similar exhalations. The rocks over the opposite side of this ravine were lofty, and cropped out boldly, striking south-east, and dipping down to the north-east in the direction of the springs. At this spot they had a bleached appearance, visible from a distance, precisely similar to that exhibited at the active springs. They bore, however, at that moment, no other sign of their past activity; but, on a near approach to them, a very perceptible odour of sulphuretted hydrogen was smelt, and the rocks themselves appeared to have had their surface disintegrated by the action of the steam.

A short distance above this spot we reached a *cul-de-sac* in the hills, bounded on the right by bold bare rocks, having the lithological characters of a coarse calcareous grit, and dipping about 15° to the north-east. This was the spot occupied by the present

active sulphur-springs, and was of small extent, embracing not more than two acres of ground, whose desolation formed a very striking contrast to the verdure on nearly three sides of it. This spot was perfectly barren, and was filled up with low hillocks of friable rocks, loose stones and débris, having the character of a moraine, [p. 73] and interspersed at irregular intervals with shallow pits or depressions, containing mud and sand, and sometimes foul, muddy water. From cracks and fissures in these depressions arose clouds of steam, and yellow patches of sulphur were visible from a distance.

At the time of my visit, in the middle of June 1866, there were seven or eight springs in a more or less active condition, from which clouds of superheated steam arose, either by a small round hole, or narrow fissure, or by several such apertures. The rushing steam produced a loud noise, like that accompanying the blowing off of steam from a boiler; and above the fissures was a quantity of sublimated sulphur, adhering to the rock in acicular crystals, forming, about the most active spring, a bright yellow patch which was visible from a considerable distance. It was no easy matter to reach the sublimed sulphur, for, on a close approach to the spot, a jet of hot steam made it necessary to withdraw, and warned us that a nearer approach was dangerous. I managed however, with the aid of a stick, to procure some from the crevices in and around which it was deposited. Most of the springs were dry; but one rose through muddy water, which bubbled up in a series of rapid explosions, carrying the boiling water, sand, and mud five or six feet high, and splashing it all around.

It is evident that the degree of activity of these springs is very variable, and that at the time of my visit they were in a comparatively quiescent state. The jets of steam were isolated, and a comparatively small portion of the two acres, at which I estimated the area of grey barrenness, was in an active condition. Numerous pits which had evidently at some period sent forth their jets of steam were perfectly quiet, and stones coated with sulphur scattered among them [p. 74] showed their occasional activity. Moreover, the edge of the level, where it began to descend down the ravine before mentioned, was covered with a thick crust, which had evidently been at one time in a semifluid state, and had slowly flowed, a viscous mass, over the edge, and now had the appearance of dried asphalt. This was doubtless the remains of mud, through which the sulphur rose, such as we still saw in some comparatively small pools, but which at one time had been in sufficient quantity to rise above the general depression and run over the edge into the ravine.

The sulphur appeared in all cases to be deposited in a perfectly pure sublimed form; nor was there any smell to be detected in the active springs themselves. The steam is laden with the element in a dissolved condition, and deposits it in pure crystals upon any substance with which it comes in contact. The effects produced upon the exposed rocks were in all cases due to the disintegrating and bleaching effects of steam; and the smell of sulphuretted hydrogen was most perceptible in a spot where the rocks had been disintegrated, but where there was no sign of present activity.

It has been supposed that the locality is very fatal to animal life, from the presence of sulphurous vapours, -- that it is a sort of Avernus, destroying birds and insects which pass in its neighborhood. But I cannot endorse this view. I myself observed birds and insects flying over it with ease and impunity, nor was any noxious smell elsewhere perceptible. Any ill effects could be produced only by the direct action of the *steam,* with which the *sulphur* could have little or nothing to do; and if any corroboration of this were required, it need only be mentioned that the patch occupied by the sulphur-springs is immediately surrounded by the brightest verdure, [p. 75] and a stream of clear water runs along its edge, and alone separates it from padi fields in the most green and healthy condition.

At the present time no attempt is made to obtain sulphur from this prolific source. Although it can be obtained at the rate of 45 cents per picul of 133 lbs. (about 2*s.* per cwt.), the Chinese Government stupidly and obstinately forbid its being worked. Still, sulphur has been largely obtained from these springs under the rose, or by means of a bribe, and it yet remains for European enterprise to open up so important and probably almost inexhaustible a source of this valuable material.

On the 25th May, Captain Bullock having decided to take the ship round to Ke-lung harbour, on the east coast, I made arrangements to proceed overland and meet her there. The journey across the country could, as I learned, be performed almost entirely by boat, with no other difficulty than some rapids in the higher part of the river. It was, moreover, short, and was not unfrequently performed by two or three gentlemen who carried on the occupation of merchants either at Tam-suy or Ke-lung, and had often occasion to communicate personally with one or the other town. Having therefore obtained the necessary information from them, Mr. Sutton, the chief engineer of the "Serpent," and myself, proceeded at once to make our preparations for the voyage.

Having obtained a *sampan*, or native boat, with three man, we placed in it provisions for two days, camera, collecting apparatus, &c., intending to proceed leisurely. The boat was a flat-bottomed one, adapted for the peculiar navigation, about 20 feet long and six feet wide, covered with a bamboo awning, and having a grass mat at the bottom; and, with the [p. 76] aid of a large mat-sail and a sea-breeze, we rapidly proceeded up the Tam-suy River, soon arriving at the spot where it first divides at Kan-tow. From here we followed the right-hand branch which flows east by south through cultivated fields, in which we occasionally met with patches of Boehmeria nivea, and small groves of betel-palm (Areca catechu); but the characteristic tree of the banks here, as everywhere along the river, was the bamboo, whose graceful and feathery foliage gave a great charm to the scene. On the north-east side were numerous hills, of heights varying between 1000 and 1500 feet, amongst which are situated the sulphur-springs, already described. A little more than three miles brought us to the village of Pah-chie-nah, which is more airy and cleanly than either Mbangka or Hoo-wei, and possesses an excellent market-place, though the inhabitants appear to be of the same poor class. Numerous duck-boats were met with on these banks, which bring some couple of

hundred ducks to a feeding-ground, where they are turned loose to spend the day under the charge of a lad, who acts as duck-herd. They keep close together all day, so that they might all be covered with a blanket, and at night are conveyed in the boat back to their pens. Another feature of the route was the Chinese water-wheels for irrigating the fields, in which three or four Chinese are constantly at work, treadmill-fashion.

At sunset we moored our boat a mile beyond Pah-chie-nah, in a bend of the river and at the foot of a hill which commanded a magnificent view of the noble range of mountains running from north to south of the island, and which the setting sun lighted up gloriously. On the opposite side of the river, upon a steep rocky bank, was a house, outside of which sat a family of Chinese of a better class, the head [p. 77] of which having, somewhat to our surprise, leisurely examined us with a good double field-glass, made signs for us to go over and *chin-chin* with them. We accordingly did so, and, having partaken of their tea, offered them some of our own provisions, with which they appeared much interested, particularly the white bread, though the loaf-sugar seemed most generally appreciated.

We slept in the boat, the night being brilliantly fine, a strong dew falling towards sunrise, and the stillness being broken by the croaking of frogs, the chirping of cicadas, the occasional leaping of a large fish in the stream, the passage of boats up the river, and the distant creaking of a water-wheel which appeared to be in action all night long. A strong tide was flowing; but the water appeared perfectly fresh to the taste, even at the flood. We had agreed to keep watch and watch during the night, and I most religiously kept awake during the first hours, listening to these various sounds. When, however, my turn had passed, and after a short nap I awoke, I was not a little disgusted to find my companion snoring instead of watching. But there did not appear to be any real reason for the precaution.

The following morning, after taking some photographic views, capturing some of the beautiful butterflies and beetles which, especially the former, abounded on the hills, we proceeded on our journey. The thermometer being at 89° in the shade, we were glad of our bamboo awning; and there being no wind and a strong ebb tide, we made but little progress for some time, moving slowly by a very meandering course through a highly picturesque country. Hills of varying height rose on either side, usually covered with vegetation, and occasionally opening and showing green padi fields; while in front an abrupt and very remarkable [p. 78] long stratified hill occupied a conspicuous part of the landscape, and this we gradually approached till we reached the town of Sik-kow, behind which it was situated.

Sik-kow is similar in character to the other towns on the route; but the streets are wider than those of Mbangka or Hoo-wei. The inhabitants, however, did not give us any notion of their being more simple or primitive on account of their comparative seclusion, but rather the reverse. A noisy crowd followed us through the streets, some

members of which appeared to incline to impudence, and one man seemed by his loud talk and gestures to be attempting to incite others against us, which the general greeting of "*hwan-ha*" (foreigners) was heard no less here than everywhere else on the route.

Leaving Sik-kow, we proceeded eastward through similar scenery, increasing, however, in its striking character, for some six miles further. A little beyond Sik-kow on the left bank, a bed of large oyster-shells, some of them eight or nine inches in length, and having a close resemblance to, if not identical with, the recent Ostrea canadensis, arrested our attention. They were imbedded in stiff blue clay in the river's bank, and immediately overlies a thin seam of an inferior coal, which cropped out beneath. The bank (which, as in most other places, was perforated with the innumerable holes of freshwater crabs), including clay, shells, and coal, was about four feet high above the water's edge, and the bed extended about 100 yards in length.

We arrived at the town of Chuy-teng-cha at nightfall; and here, as its name implies, the tide-way ends. As it was dark we did not land, but proceeded a little further, and passed the night in a small bay at the foot of the rapids. Numerous boats upon the beach and many in motion seemed [p. 79] to show that this was a busy town of some importance; and by questions put and answered, as we passed, in which we could hear from time to time the word "hwan-ha," we knew that the people were discussing our movements and the kind of freight our boatmen had under their charge. We had no fear of them, however, for they turned out to be excellent fellows, good-tempered, willing, and obliging, and mightily amused at all our proceedings -- one of them, in particular, laughing from morning till night.

On the second night, as before, we were tormented by mosquitoes, which made it difficult to obtain any rest; while the close heat of the atmosphere made us wish to divest ourselves of some of our clothing, a proceeding forbidden by the tormenting insects. Frogs and cicadas again kept up a serenade all night; and a nocturnal bird sang a harsh song in some trees upon a cliff opposite. I could not get a sight of this bird, whose four notes somewhat resembled the creaking of a wheel; the last two notes being often repeated twice. As soon as dawn began to appear it flew away, and I heard it no more. At the same time two or three large bats, which at first in the twilight I mistook for owls, flew home to their retreats with a loud croak.

As soon as the sun arose, pheasants began to crow upon the fern-covered hills, and we heard and saw several during the day; but, although we landed for the purpose, we were unable to get a shot. But by far the commonest bird we met with throughout was a black bird -- whose feathers, however, had a rich green gloss -- about the size of an English ousel, with a long forked tail and whitish rump. This bird made a harsh note not unlike a jay. This was the Black Drongo, Dicrurus macrocercus of Latham; they were visible everywhere along the banks, usually in pairs, seldom flying over [p. 80] the river, and often perched upon the topmost spray of a bamboo in a conspicuous position. I procured the nest and eggs of this bird. The nest was made of dried grass and cotton-

grass, simple in form, and situated upon the bough of a tree about 15 feet from the ground; the eggs were three in number -- pinkish, with sparse umber spots and blotches, particularly about the larger end. The other birds I noticed were doves of a small species, kingfishers, pied wagtails, grey shrikes, and a small short-tailed bird (Cotyle sinensis), with the habits and character of a sand martin. Early in the morning, a lark (probably Alauda coelivox) singing in the fields could scarcely be distinguished from the English skylark, and another bird's song reminded me greatly of the English song-thrush. A second thrush-like bird also was singing, as well as the sprightly little Prinia sonitans; but not more than half-a-dozen birds could be said to be in song here, at a time when nearly thirty would be enlivening the woods and groves of England.

Having passed the end of the tide-way, the remainder of the journey was made through a series of strong rapids, up which it was necessary to drag the boat by main force. They commenced immediately from our resting-place of the previous night, and our boatmen jumped out of the bows, and passing a bamboo across them pushed one on each side, while the third pushed behind, and thus our flat-bottomed craft moved up the incline into a reach of deep water. This proceeding was repeated perhaps a score of times, the intervening reaches being bounded by very beautiful wooded hills, with precipitous rocks dipping to the water's edge about 15° to the east. Many beautiful secluded retreats were thus passed, generally, however, with signs of life near them; for it is remarkable how densely populated this side [p. 81] of the island appears to be -- nowhere could we go without meeting Chinese in some form or other: in the quietest and most retired spots a cottage might often be descried upon close inspection. If we wished to shoot a bird among the brushwood, we were most likely to find a group of women and children peering at us from behind; if it were on the bank, some fishermen at work, or lads wading in the mud for shell-fish, or women washing in the stream, were sure to be there so that it was never safe to shoot, except at the upper part of the trees. Ferries were numerous, and generally at work as we passed; water-wheels were met with at every turn, generally worked by three men, or two sets of three; children leading water-buffaloes on the bank were frequently seen, and the unwieldy heads of these animals often peered at us above the water with a mingled expression of curiosity and stupidity; and even in the midst of the stream were Chinamen and boys, sometimes stark naked, but more frequently with something about the loins, dredging for shell-fish and crabs in the river. The shell most commonly obtained in these situations was a dark costate species of Cyrena; but in the markets two other species were equally abundant as articles of food, viz. Cytheraea petechiana, and a species of Tapes. A long black Modiola (M. teres) was also largely eaten. But everything is fish that comes to the Chinaman's net, and he is always at work, even in the most unpromising situations, to earn a livelihood in a mud-bank, or a sand-flat, or up to his neck in water in a river. Population teemed everywhere, and, while in England we might have walked for miles without meeting an individual, we were scarcely ever out of sight of some human being in this part of Formosa.

The houses were built of mud and thatched, occasionally [p. 82] more substantially of brick and tiles, but usually of grass and reeds, arranged in tiers, and plastered over with mud and cement, -- the floor, even of the better houses, of mud or earth, -- the roofs, often crescentically gabled, giving the towns a very characteristic appearance. In the poorer houses in villages, the pigs and fowls made themselves quite at home in the interior, and I have seen a large cesspool only partially separated from the dwelling-room. Pigs, fowls, ducks, geese, and buffaloes, were the only domestic animals, if we except the dogs and cats. The cats were mostly of the Malay breed, with a short broken or twisted tail, and usually tortoise-shell in colour; the dogs most commonly black, seldom white, of an ugly mongrel appearance, about the size of a pointer; they barked vigorously as soon as they caught sight of the foreigner, though there was no fear of their biting, provided we possessed a stick, for they were most arrant cowards. Horses and asses were unknown, and humped cattle, of a small size, rare.

At length we entered a narrow gorge of rocks, which only left room for two boats to pass one another, and warned us that the aquatic part of our excursion was at an end, and in a few minutes we were in the midst of a number of boats the counterparts of our own, which completely lined a beach about 100 yards long, scarcely leaving space for the painted nose of our own craft to insinuate itself between them. Here were clustered some houses forming the village of Liang-kha, about three miles from Ke-lung, where the river we had ascended abruptly terminated on the shoulder of a hill, up which we had risen by a series of rapids, another and a smaller stream branching off from the same spot, and descending the other side towards Ke-lung.

Having placed our gear in a chair obtained from Ke-lung, [p.83] we proceeded on foot through a pass on the hills, meeting on the way numerous coolies transporting goods of various kinds from Ke-lung. Some carried heavy bundles of dressed hemp; others, barrels of dried flying-fish of a large size. A sudden turn of the road brought us in view of a splendid panorama -- the valley, town, and spacious harbour of Ke-lung, forming altogether a fine picture. On the densely wooded knolls in the valley, tree-ferns were conspicuous; the sandstone hills on the left dipped in long stratified lines to the south-west; and outside the harbour, in which three square-rigged ships, as well as numerous junks, were lying at anchor, stood like a sentinel an abrupt rock, 600 feet high, known as Ke-lung Island, and bearing some resemblance to St. Michael's Mount. On the right was the interesting coal-region, which renders Ke-lung so important a port, in which good anchorage and plenty of fuel may be always readily obtained.

Descending into this valley we passed through the town of Ke-lung, paying our sole visit to it on this occasion. It seemed larger and more open than those we had previously seen, but was inhabited by the same class, who indeed gave us an unfavorable impression, by detaining us at the landing-place until we satisfied their exorbitant demands, urged with an unpleasant degree of noise and tumult. We afterwards learned that they had on more than one occasion threatened the life of one

or two Europeans who were resident here, and who by maintaining an independent demeanour, and refusing to succumb to their prejudices, had rendered themselves obnoxious. Like the Chinese generally, however, they require to be dealt with firmly; and the only way to establish oneself in security among them is to show them a bold and determined front -- taking [p. 83] at the same time proper means to avoid public collision or private revenge. The vice-consul, however, a kind and well-intentioned man, possesses but little of this determination, and is unfortunately too ready to humour their prejudices, and show respect to their most outrageous feelings and wishes, which have more than once bred riot both at Tam-suy and at Ke-lung.

At length we got clear of the turbulent crowd, and having placed our *matériel* in a boat, we found the "Serpent" at anchor near the mouth of the harbour, and at a considerable distance from the town, which was the principal reason why we never returned to it, although it is to be regretted that no photograph was taken from the hills behind, which commanded so unusually fine a prospect.

Chapter VI. Formosa (continued) -- Ke-lung.

[P. 85] Prevalence of Sandstone -- Formation of the Harbour -- Caverns -- Village Populations -- Modes of Fishing -- Sandstone Peaks and Images -- Rising of the Coast -- The Coal Mines; mode of Working; value of the Coal; geological position of the Beds; burning Properties -- Petroleum -- Marine Animals of the Shore -- Peronia -- Aplysia -- Nudibranches -- Creseis -- Singular shoal of Stephanomias.

Finding good anchorage in the harbour of Ke-lung we remained there for some weeks, or rather we made this place a starting point for some interesting excursions, returning to it again during the interval, and allowing thus some opportunity for geological and natural history investigations.

On this side of the island sandstone prevails, and the whole environs of the town of Ke-lung are of that rock, which extends from Masou peninsula, north of Ke-lung, to Petou promontory on the south and east. The section of the coast between these points exhibits inclined beds of red sandstone with an average dip of 16 degrees or 17 degrees to the south-east, the weatherworn outcrops producing and undulating country. The hills at the back of the town of Ke-lung are also of the same formation, and have a similar dip and strike. The harbour of Ke-lung is a spacious excavation in these sandstone strata, the navigable entrance being narrowed by a low flat sandstone table ten feet above high-water, called Bush Island, on the south side; between which and the [p. 86] mainland is also a larger island, which has evidently been separated from it by the bursting of a narrow passage, and its subsequent gradual wearing away by the sea, which washes through at high-water. This is Palm Island, upon which, however, no palms grow; but a few Cycads, which have probably been mistaken for them.

Ke-lung harbour presents many remarkable and interesting features. The north side is picturesquely indented, and more or less covered with luxuriant foliage; but the south side, where the ascending strata are abruptly broken off, presents a beautiful succession of rounded knolls, separated by narrow valleys and steep-sided ravines; the whole being densely clothed with trees and verdant underwood, in which occurred yellow Cassidae of various species, and great numbers of a beautiful fringed land shell (Helix trichotropis). Several caverns exist upon this side of the harbour. The largest and most remarkable of these was reported to be of very considerable extent, and mysterious tales were told of the difficulty or impossibility of exploring it; we therefore determined to make the attempt. The entrance was prettily ornamented and overgrown with ferns, lycopods and begonias; it faced the mouth of the harbour, and was lofty and spacious, having a sandstone roof above of 50 or 60 feet in thickness. The main cavern was arched and symmetrical; but we soon found that this part at least was very limited in depth, for having penetrated about 50 yards we arrived at its extremity. It was rather damp, and the floor was of hard sandstone, presenting no indications of any deposit in which one might look for organic remains with any chance of success. In the left wall, however, we found a narrow fissure, which was the really unknown portion, and being provided with a magnesium lamp, we squeezed ourselves [p. 87] into the cleft, and crept along it with difficulty for 70 or 80 yards. One stoutish gentleman of our party fairly stuck in the middle, and was only hauled our with difficulty by the combined efforts of a blue-jacket before and behind. This fissure was very damp, and at length terminated in a small irregular chamber, beyond which we could see no passage. Its proportions were well seen by the aid of the magnesium light, which so illuminated the vault, that the gentleman before mentioned, who was wedged in midway, flattered himself that if he could once get out of his difficulty he should find himself in broad daylight.

While examining the walls by the aid of this light, I found they were tenanted by some spiders and crickets, of the latter of which I with some difficulty secured specimens. They proved on examination to possess perfect eyes, although the place is of course totally dark; and it is therefore to be concluded that they had simply crept in from the exterior, though what could be the inducement, or upon what they subsisted, it is difficult to imagine -- for the rocky walls were perfectly bare, and the whole intervening distance was dripping with water. Returning to the main cavern, I was curious to see if they also existed there; and at the extremity of this I also discovered the crickets upon the damp wall.

On either side of the harbour are several villages, inhabited by a poor fishing population. These villages give a lively aspect to the spot. One of them, close to the mouth of the cavern, being near the landing place, we often visited, and soon became acquainted with the entire population, whom we employed in collecting shells, &c. Had the district been a rich one in these commodities, we should doubtless soon have made a good collection, for the younger part of the community, both boys and girls, soon found that they [p. 88] could raise a little money in this way; and every time we

appeared on shore we were speedily surrounded by an eager crowd of half-naked and tolerably dirty urchins, who pressed upon us the common but pretty cowries, Cypraea pellis-serpentis and C. annulus, &c., and all manner of trash. The boys were forward enough, but the girls were very timid, and for a long time would only hold out their hands at a distance to show they were anxious to trade, but afraid to come too near the *Hwan-ha* (foreigners). From the miscellaneous collection thus presented to us, we selected a small number, for which we had a fixed price of a few *cash* -- a most convenient medium of exchange -- for inasmuch as 1000 go to a dollar, two cash for a cowry, a helix, or a beetle, while it added considerably to their exchequer, at the same time did not threaten to ruin ours. The inhabitants of these fishing villages were Chinese, and therefore not idle. The girls and younger boys were daily out, as long as the tide permitted, among the rocks gathering shell-fish, and it was not uncommon to see them up to their necks in water, collecting what forms to them a very important article of diet. The men were employed in the fishing boats, or in hauling the seine, which took place chiefly on the sandy beach of the south side; but although the seine was very extensive, and the operation of pulling it a very laborious one, the result did not seem to be at all adequate. I went ashore on one or two occasions during the haul, in search of fish, but did not succeed in getting anything but very small sprat-like fishes. Nothing larger appeared to be caught. Every evening, too, at dusk, numerous boats pulled out from the town to the wider part of the harbour, and after dark a number of blazing torches spread a lurid light over the water. Curious to see what they were doing, I one night took a boat and rowed [p. 89] amongst them. In each boat stood a man at the bow, holding a bundle of small bamboos, which blazed so brightly that I was hardly convinced that they were not dipped in oil, until an examination proved them to be dry. This flaming torch, with which about three boats out of four were provided, served to attract the fish, and when the boat was thus surrounded with fish, a signal was made to another boat unprovided with a light, which coming up, drew a net around the illuminated boat, and this secured the shoal. This was done with great shouts and noise, which we often heard, lasting far into the night. I boarded one of these boats, and saw them haul the net; but the produce seemed to be entirely confined to a small white fish like whitebait. The fishermen were civil enough, although we rowed right in among their operations; but they did not appear at all anxious to dispose of the fish, which were sweet-tasted, and if cooked at Blackwall would probably rival the real whitebait.

The effects of aqueous action upon the sandstone rocks are very conspicuous in some parts of Ke-lung harbour. Near the cave before-mentioned, and immediately upon the verge of high water, is a tall isolated sandstone rock, having precisely the appearance of an old ruined castle, and appropriately named Ruin Rock, which forms an excellent land-mark by which to anchor a ship. The harder layers of sandstone having defied the effects of weather and the spray which is dashed up during the north-east monsoon to which the harbour is exposed, the softer portions have at the same time been more or less excavated, leaving a mimic resemblance of the ruined chambers of a three-storied building. But the most curious and extensive effects of the direct

action of the sea are to be found at the entrance [p. 90] of the harbour on either side. That on the north side is called Image Point on the chart, but the south side is even more remarkable, and no less deserves this name, while the effects are upon a larger scale.[1] Crossing over the narrow sandstone platform connecting Palm Island with the mainland, and which is covered at high water, I found myself in an extraordinary spot, where the soft sandstone has been worn away by the force of the waves into a variety of fantastic forms, for the most part resembling gigantic mushrooms -- huge stalks, 10 or 12 feet high, bearing vast balls of harder material upon their summits, like immense nine-pins; hills with excavated flanks, and harder knobs and ridges, over the foremost of which the waves were dashing, sending up the spray 50 or 60 feet high, although the sea was comparatively calm. Some of the heads of these huge mushrooms had fallen off, and remained as great round blocks with hard ridges, such as are often seen, but whose history could here be distinctly traced, as could also a further step in the disintegration of the beach; -- for in many places round, deep holes were bored in the solid rock, which were evidently produced by one of these hard heads resting upon a softer spot, where it had been twisted and whirled about by the waves, wearing and boring its bed as though with an auger, sinking deeper and deeper, until at length it was itself worn away and dissipated by the long-continued grinding action, leaving a clean-cut deep hole in the rock from a foot to a yard in diameter, but containing nothing but clear sea water.

I have little doubt that the harbour of Ke-lung is slowly rising, though I have not sufficient data to show the rate of elevation. The evidences of this elevation are to be [p. 91] found on both sides of the harbour. Blocks of worn and washed coral strew the beach on the north side, and lie about confusedly at high-water mark in the neighborhood of Ruin Rock. Similar washed coral blocks lie on the beach between tide-marks on the south side, viz. on Palm Island. The sandstone platform between Palm Island and the mainland, which presents every appearance of having been excavated by the sea slowly forcing a passage though, is now very little below high-water mark; and above the sea level the sandstone rock bears plain indications of having been washed and worn by the waves where vegetation is now growing. Beyond the present limits of the harbour, the level plain at the back of the town shows that the sea once extended farther among the hills; and the inner third of the present harbour is so shallow as to be a mere mud flat at low water. Quite recently the middle third has become too shallow for the anchorage of large ships, such as had previously found sufficient depth; but this fact may be due to the evil practice of throwing ballast into the harbour to save the trouble of carrying it ashore; for, although the Chinese are industrious enough to work when necessary, they have but little conscience; and if engaged to unlade a ship in ballast, they will do so, but will drop it overboard at the nearest convenient spot, as I

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[1]See Frontispiece.

have seen them do, without the slightest consideration for the deterioration of an anchorage or the shoaling of a sheltered landing-place.

This part of Formosa derives commercial importance from the existence of coal-mines, which are possessed and worked by the Chinese authorities. I visited these mines, which are situated about a mile and a half to the eastward of the town of Ke-lung, on the sides of the hills bordering on Quar-se-kau [p. 92] Bay. Being in communication with the owners of coal depots for the purchase of coal for the ship, we were brought into contact with a civil Chinaman, who was acting as compradore for Messrs. Lessler and Hagen of Tam-suy. This man spoke and wrote excellent English, having been educated at the English school in Penang, and when subsequently he superintended the delivery of the coals on board ship, the sailors were not a little astonished, and stood around open-mouthed, to see a smart young Chinaman with pig-tail, long silk coat, thick-soled shoes, and about whose nationality there could be no mistake, sitting at a table on deck and writing an elegant, free, commercial hand, while he communicated with the officers in fluent and grammatical English. This man politely lent us his gig and two rowers to conduct us to the mines. The two men were very good-humoured, particularly the younger one, who laughed immensely at everything we said and did. Having rowed us nearly up to the town, the harbour getting very shallow as we proceeded, so that at length only a narrow channel between two mud-flats approaches the town, we entered a small, muddy creek, with so little water that our boatmen had several times to jump out and pull the boat along. The hills were beautifully wooded, and the glen narrowed as we proceeded. At length, quitting the boat, we ascended a slight elevation, passing a range of red sandstone hills, which formed a series continuous with those seen at the back of the harbour, and which dip an average 16 degrees or 17 degrees to the south-east. The weather-worn outcrops of these strata produced the undulating country in which I now found myself, and in the depressions of which the coal appears to have been deposited. We now entered a *cul-de-sac* in the hills, and, descending from the path into a ditch, I [p. 93] stood at the entrance of the workings, which consisted of two small caverns at right angles to one another, hewn directly into the coal seam, which was 2 1/2 feet in thickness at its outcrop. The seam rested upon a thin bed of stiff, whitish clay, and was covered by a bank 40 or 50 feet high composed of rubbly clay with stones, on the face of which small bushes were growing. Out of these caverns a dirty stream of water was flowing, ankle deep. The working was nearly level, and the roof so low that one could only get along by bending nearly double. There was nothing remarkable in the interior; the workmen, all Chinese, were in a state of perfect nudity, and after a painful and very dirty walk of about a quarter of a mile, we emerged at another part of the hill.

These mines appear, therefore, to be worked in a very primitive manner. No shafts are sunk, nor is any machinery employed, but the coolies pick the coal and convey it out of the working in small baskets, and in almost infinitesimal quantities at a time. It is placed in boats and conveyed to the harbour, where it is deposited in the coal-stores situated upon the southern side -- mere accumulations of coal purchased by

English and other merchants, and from which ships are mostly supplied. These stores have no covering, nor any protection whatever from the weather, and the coal therefore is apt to deteriorate if kept there long. The mines themselves are exclusively worked under the Chinese authorities, and by Chinese coolies, foreign interference or possession being jealously guarded against: the consequence is, that their resources are both undeveloped and unknown. It is impossible to judge of their extent beneath the soil, because no shafts have been sunk, and no tentative efforts in the shape of borings appear to have been made. The wonder is rather that so much is produced by the industry [p. 94] of the coolies; its comparative cheapness is owing to the low value of coolie labour, added to the absence of expensive outlay in the working of the mines.

The coal resources of Ke-lung have only recently been made known. In 1857 it was stated that "owing to the prohibition by the authorities of Formosa against the export of rice, vessels arrived at Amoy loaded almost entirely with coal, at about 1 1/4 dollar (5*s*. 6*d*.) a ton;" and it was further said at that time that arrangements might be made for the formation of a stock for the supply of Her Majesty's vessels on very favourable terms.

In 1858 H.M.S. "Inflexible" received coals at Ke-lung at the rate of four dollars (17*s*. 6*d*.) per ton. H.M.S. "Serpent," during the year 1866, was coaled at the rate of 16 dollars the hundred piculs, which is somewhat less than three dollars (13*s*.) the ton; and for this price we selected our coal from the depots, and it was brought alongside and deposited in the bunkers. When we finally left Ke-lung, there were seven ships in the harbour -- Hamburg, Bremen, Prussian, and English, receiving coal either as cargo or for consumption.

The position of the coal-bed of Ke-lung proves that it is of comparatively recent formation. It lies apparently quite superficial; and, although it would undoubtedly require a closer and longer study than I was able to devote to it, in order to prove its exact geological relations, especially in the absence of any subterranean workings in the form of shafts or borings, the position of the worked seams is undoubtedly superficial to the sandstone. How far down the coal seams are believed to penetrate I was unable to learn, for they are in the hands of Chinese proprietors, and all the workers are Chinese, with whom I was unable to communicate directly; [p. 95] while the few European merchants who are interested in the produce were not scientifically acquainted with the district.

With regard to the quality of this coal, it has properties which favour the supposition that it is a recently-formed deposit. The first account of it made public was issued from H.M.S. "Inflexible," and the chief engineer of that ship published an account of his experiments and steaming results with it, in the *Nautical Magazine* for 1859. This account, however, is strangely at variance with our experience of the coal. In general terms the verdict given by him was that it was "good for domestic purposes and for steamers making short passages; but it consumes rapidly, and makes much smoke."

Although, however, this general statement nearly coincides with what we found to be the case, it is not supported by the elaborated and tabulated results published in the *Nautical Magazine*.

The Ke-lung coal is of very light weight; it burns very rapidly, and it gives out a very great heat -- so much so, that it readily sets the funnel on fire. It is extremely dirty, and the combustion is so imperfect, that a vast number of blacks of a soft and soiling character are produced, and fall all over the ship. The flues also rapidly get very foul, requiring frequent attention and cleansing. It leaves no less than 50 per cent. of ash, so that although it appears cheap, it is not really more so than other and better coal, which has more substance and less waste. For it is evident, that if Ke-lung coal were but one-half the price of Welsh, and that Welsh did twice as much work, the latter would be cheaper fuel; for not only would there be equal horse-power for an equal price, but the superior bulk of the inferior and apparently cheaper coal would entail great additional labour [p. 96] upon the firemen in removing it from the bunkers and feeding the furnaces, to say nothing of the waste of stowage.[2]

But the worst feature of the Ke-lung foal is that it forms a large quantity of slag, or *clinker,* which sticks firmly to the furnace bars, and becomes so heated as to fuse them. Many of the fire-bars in the "Serpent" were fused in this manner before the load was exhausted.

I was informed that at no great distance from the coal mines of Ke-lung there are sources of petroleum, which are known to some European merchants residing there, who were in treaty for the ground. The Chinese, however, are very jealous in guarding any land which is supposed to possess mineral riches, having an idea that gold is to be found there. So anxious are the present Chinese occupiers upon this point, that in any title of purchase of land there is an express stipulation, that should gold be discovered upon that land, the precious metal should not be considered as included in the purchase, but shall revert to the original possessor of the soil.

The rocks around Ke-lung harbour did not yield a very great variety of animals, although there were some of considerable interest. The sandy beach in some places was entirely formed of minute shells of a great number of species, usually more or less rubbed, but containing a considerable number of tolerably perfect specimens. In the crevices of the coral blocks which strewed the shores, shoals of small and beautiful coral-fish abounded, some of the richest azure blue (Pomacentrus), others striped and banded (Glyphitodon [p. 97] and Therapon), others yellow, green, red, and various bright colours, and of forms equally various; but unfortunately neither spirit nor glycerine succeeded in preserving their tints. The rocks, where washed by spray, were

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[2] There are some interesting points of resemblance between the coal field of Ke-lung and that of Labuan, on the coast of Borneo, of which an account will be found in Chapter X.

blackened by the swarms of Ligiae running numbly about, exhibiting a bluish metallic tint, which glanced upon their backs in the sunlight. Beautiful purple Echinin occupied the hollow places in the sandstone; and great black Holothuriae, of the kind used for Trepang, lay scattered about in many places, and these, when touched, threw out a quantity of white tenacious threads, which adhered like glue to the hand. The slug-like Peronia was not uncommon, usually found crawling upon the rocks at high water, being an animal that is satisfied with an occasional moistening of the surface. When I kept these animals alive they proved very erratic, and would never remain in the vessel, but immediately crawled out; and I found them from time to time in all parts of my cabin, even some days after I had lost them. I was therefore somewhat surprised, on a subsequent occasion, to find Peronias on the coast of Borneo, on the under side of stones which were immersed in the water. The Peronia is greenish-brown in colour, without dorsal branchiae, or mantle-tentacles, as in the Nudibranchs, but have two snail-like retractile tentacles on the head, with eyes at their points, and the whole mantle is covered with papillae, having something of the form of fleurs-de-lis. After the gale which detained us in the harbour, the low cay, called Bush Island, was covered with a fleet of little yellow Velellae and Physaliae, which had been stranded by the wind. This island, too, produced a number of beautiful Anemones, botrylliform Tunicata, &c.; but the most remarkable animals there met with were certain Tectibranchs, as they are termed, in which the shell [p. 98] is more or less undeveloped and concealed in the mantle, the gills forming leaflets also under its protection. These were the sea-hares (Aplysia), of which at least two species lived here -- one, the most common, of a uniform brown colour; the other, of larger size, marked with sparse black blotches. These animals are remarkable for their power, like the cuttle, of pouring out an abundant secretion of a purplish colour from the edge of the mantle, with which, when alarmed they stain the surrounding water. Another somewhat similar animal found here was the rich black Coriocella nigra, its flowing velvet mantle entirely concealing its shell at pleasure.

In Ke-lung harbour, although I sought diligently, my pains were rewarded by only two or three species of Nudibranchiata. Of these one was a small blue Doris, on Bush Island; the other two were, however, both new species, and interesting from their extreme beauty. One of these was a Doris of a cream-colour, edged with orange, and covered over the back with rich vermillion marbling. But the last was probably the type of a new genus, its mantle capacious, of a rich variegated rose colour, edged with white, and studded with translucent white spots -- the whole body so delicate as to be semi-transparent. Its movements were wonderfully graceful; spreading the broad and transparent mantle out wide on either side, and throwing back its long tentacles, like ears, it swam about with a moderately rapid vermicular but vertical motion, the head and tail being thrown forward till they met above, and then partially thrown back, accompanied by a waving of the front mantle from end to end.

Lying for some time at anchor in this harbour, some very interesting marine animals came under notice from time to [p. 99] time. At one time the towing-net would

bring up transparent animals which bore a close resemblance to the Cymbulia ovularis, of Rang, whose broad expansive wings, by which locomotion was effected, were placed in tuberculated and purse-shaped crystal calyx, from which it was easily separable, the whole animal being in some lights invisible but for an oblong black spot in the centre. Another of these transparent Pteropods was the Pneumodermia; but the most abundant and striking was the pretty and delicate little Creseis, with an elegant glassy shell, like an inverted church spire, pointed like a needle at one end, while, from the other, a pair of little delicate wings would keep the calm surface of the water in a constant ripple by their soft flapping to and fro. So abundantly did these little creatures swarm upon some days, that they came up in solid masses, and the towing-net was filled with them in every mesh; so that it was a long task to clear it of the fragile shells.

Beautiful Acalephs, or sea-jellies, too, were among the harbour's inhabitants; ciliogrades, like elegant pink glass flowers, in constant motion, with prismatic bands of cilia playing along the raised ridges of their body from end to end. But even these were hardly so striking as the wonderful influx of Hydrozoa, of the singular genus Stephanomia, that occurred one evening. This happened upon the 18th of June. Although calm, it had been a wet day; yet, in spite of this, myriads and myriads of Creseis swarmed in the harbour. During the day a breeze sprang up, and at times rollers came in; but as the afternoon advanced, the sea became alive with marine animals, including some of the forms I have already described, but chiefly beautiful organisms which most closely resembled the Stephanomia triangularis of Quoy and Gaimard. They were wonderfully sculptured [p. 100] and carved masses of solid jelly, either perfectly transparent, or tinged with pink. They would bear being taken up carefully in a hand-net, and placed in a basin of sea water, but when there, they became absolutely invisible from their delicacy and transparency. When touched they would break asunder into transparent, gelatinous, star-like bodies; so that I was in despair at getting even a sketch of their complicated forms, for they soon melted away into shapeless masses. I endeavored to preserve some in various substances, but without success, for they immediately fell to pieces and dissolved.

These bodies were solid to the tough, about three inches long, and appeared to be formed by the union of gelatinous bodies (swimming bells) of very complex form, and dissimilar at different parts of their length, so that the diameter of one-third was greater than that of the other two-thirds. I was much disappointed at my unsuccessful attempts to keep some record of them; but their invisibility, their fragility, and the approach of darkness, rendered all my attempts futile, and although I might have succeeded better if I had had another opportunity, I never saw anything like them on any subsequent occasion.

But the circumstance to be especially remarked is, that during all the time these curious animals were floating by, it was raining pretty hard -- a condition which, *a priori,* might be supposed to have been most unfavourable for them; for the destructive character of fresh water to delicate marine animals is well known. Whence, too, could

they have come in such profusion? And if the surface of the sea is their natural habitat, why are they not more frequently seen?

Chapter VII. Formosa (continued) -- Sau-o Bay.

East Coast -- Steep Island -- Reefs at Sau-o -- Chinese Village of Sau-o -- Village of Tame Aborigines -- Their Huts -- Physical Characteristics -- Dress -- Native Cloth -- Search after the Wild Aborigines -- Characteristics of the Villagers -- Their Occupations -- An Alarm -- They visit the Ship -- Native Politeness -- Language -- Religious Ideas -- Diseases -- Distinctions from Chinese Race.

The east coast of Formosa, as has been already observed, is remarkable for the absence of harbours; the mountains for the most part running sheer down into the sea. There is a landing-place at Chock-e-day, a considerable distance to the south; but the only harbour is at Sau-o Bay, some 30 miles south of Ke-lung.

The Vice-Consul having called Captain Bullock's attention to some reported dangers about this important harbour of refuge, it was determined to visit it; for, although a plan of the harbour was appended to the chart of Formosa, since that plan had been constructed during a hasty visit, and represented only about six hours' work, it was probable that important improvements and corrections might be made. We had promised ourselves much gratification from a visit to this interesting locality, on account of its being a spot but very little known, and which very few have visited; and also because we hoped to see something of the aborigines of the island. Accompanied by the Vice-Consul at Tam-suy, [p. 102] and two or three other gentlemen, we accordingly left Ke-lung on the 12th June. After passing Petou promontory the contour of the coast changed, becoming less bold, and more retiring and flat, until we had reached the embouchure of the Kaleewan, one of the largest rivers in Formosa. This river flows into the sea, through a fertile plain 13 miles long and six broad, which supports about 10,000 inhabitants. Nearly opposite to it, at 10 or 11 miles distance, is a large island terminating in two peaks, the highest 1200 feet, the lower 800 feet high, presenting a precipitous face eastward to the sea; but, although we went on both sides of Steep Island, and near enough to see that it was cultivated in terraces to a considerable height on the landward side, we were unable to disembark upon it, and I cannot, therefore, speak with certainty of its formation.

The entrance to Sau-o Bay is protected or jeopardised (as the case may be) by a reef, which is nothing more nor less than a great trap dyke, running out nearly at right angles to the coast, and over which the waves dashed wildly, for the wind had risen. It extends a mile out, for the most part just above water, but rising into three prominent rocky peaks, one of which is 70 feet above low-water, and all three are whitened with the deposit of sea-birds which were resting upon them. Another reef, nearly at right angles to this, and probably of the same nature, runs across the harbour for about 300

yards, the highest point being a conical rock 15 feet high, the rest only just above water. It forms a natural breakwater, and, without blocking up the mouth of the harbour, shelters the interior, which is spacious, though not free from danger.

Sau-o Bay is shut in by lofty hills, for the most part steep, and densely clothed with forest. The formation is [p. 103] that of a compact, black, slatey rock, having a conspicuous cleavage varying in direction, and being in some places perpendicular to the level of the sea. There is no sandstone here, though there is abundance of sand upon the beaches. As we entered the harbour we observed, upon the north side, a hamlet of Chinese fishermen, consisting of half a dozen cottages on the hill-side, their boats being drawn up on the beach in front. Passing this by, we proceeded to the innermost or west side of the harbour, and anchored near a sandy beach, beyond which we could see the roofs of the houses of the principal village, called Sau-o, two other villages in the bay being, as we afterwards found, concealed from view. All the rest of the bay had a desolate and life-less appearance, the wooded hills sweeping down to the water's edge, and presenting an aspect of wildness, which well accorded with our belief, that they were inhabited by the still savage aborigines of Formosa.

On the approach of the vessel, numbers of people assembled on the beach from the large Chinese village of Sau-o, attracted by the unusual circumstance: among them the *gamins* were conspicuous, capering about on the sand, while their more sober elders formed a long line in the background, squatting on their hams, and discussing over their pipes the cause of the phenomenon. As soon as we landed, we were escorted into the village by the crowd, and, on reaching it, were received by several explosions, which we were fain to consider a salute of honour. Sundry warlike-looking personages, armed with matchlocks, had turned out to meet the suspicious-looking strangers; but seeing us walking unarmed and amicable among the citizens, they fired their weapons harmlessly in the air for effect. They allowed us to examine their matchlocks, which we were told [p. 104] were manufactured at Amoy; and their ammunition, consisting of very coarse powder, with a finer grain for the priming, and bullets -- some round, some oblong, some rectangular.

We found nothing remarkable in this village, which was essentially Chinese in its dirt, its pigs, and its inhabitants -- closely resembling in character the other towns of Formosa; but out attention was arrested by a woman, whose handsome and European-looking features, and peculiar voice, at once marked her as non-Chinese, and showed her to be one of the aboriginal inhabitants. How she came thus domesticated among the Chinese we could not learn, but we heard from various quarters that a system of petty warfare is kept up between the two races, and that occasionally some of the women are carried off by the opposing parties.

The following morning we landed on the southern side of the bay, where we were to find the native village, of which no trace however was visible from the ship. We were met upon the beach by a number of men and women, who were in no respect,

either of dress or feature, similar to the Chinese, and along with them, after the first expressions of surprise and curiosity, we entered the village. This is rudely walled, the entrance being through doors at either side, by which we passed into an assemblage of huts constructed chiefly of grass and bamboos. The grass is woven into a kind of trellis or mat, which is placed against the sides, while the chief part of the walls is constructed of upright sticks, the interstices being imperfectly plastered with mud to keep out the weather. The door is of bamboo, and fixed upon a rude hinge, the lower part revolving sometimes upon the bottom of an earthen cup, to give freedom of motion. The roof is a thick thatch of grass and herbs [p. 105] (in which a species of Turk's-cap lily is largely used), and is supported by bamboos irregularly disposed among it. At one end is often an overhanging shed, containing a supply of firewood, of which there is everywhere abundance.

The interior of these huts contained but little; a stone stove, and a square flat board in one corner, which did service for a bed -- apparently for the whole family -- appearing to constitute nearly the whole furniture. Articles employed in fishing might be seen stuck into the thatch and a stool or two was to be found in most cottages. Besides these, a few small articles of convenience existed which could be found when required by the owner.

The occupants of the habitations were a fine race of people, much superior in good looks to the Chinese; their features being more regular and well-formed, and their expression decidedly more intelligent. The complexion was olive, the eyes wanting the obliquity so characteristic of the Mongol race, the cheek-bones less high and prominent, the lips somewhat thick, and the chin well turned, giving altogether a very pleasing expression, neither stupid nor savage. The hair was usually black, but sometimes had a decidedly reddish cast, and that of the women was luxuriant and tied with a loose knot, while the men had adopted the Chinese custom of shaving the forehead, though not so far back as the vertex, and wearing a pigtail. Their aspect and *physique* were in many cases very striking, and among them we saw both men and women of stalwart proportions. Some of the young girls were decidedly pretty, and exhibited all the coquetry, the love of finery, and other characteristics, which distinguish the sex in general in other parts of the world.

The costume of these people was somewhat slight. The [p. 106] men were attired similarly to Chinese coolies, that is, usually in a simple pair of short drawers, to which, in some cases, a blouse was added. The dress of the women consisted of a short petticoat, folded round the loins and meeting in front, where it overlapped, but was not fastened. This petticoat did not reach so far as the knees, and the feet and legs were bare. A sort of loose jacket, open in front, completed their attire, though some of the matrons did not make use of this addition. This, however, appears to be a costume not always considered necessary, and those who landed at the village early on the second morning report that the population was more scantily clad, the men being entirely naked, and the women wearing only a flap round the loins. Seeing the strangers arrive,

however, they retired with deliberation to their huts, closed the doors, and reappeared in the costume above described. The women possessed necklaces of beads, which they wore round their necks, and some of them had stone bangles round their arms; their ears were pierced in three or four places from the lobe upwards, though none of them seemed to have ornaments in them, except buttons, often of the commonest kind. The young children of both sexes were entirely naked. Most of them had objects round their necks, such as coins, beads, or buttons.

It should be mentioned that, in most cases, the garments worn by these people were made from a cloth of their own manufacture. This was a stout material, the threads of which were usually arranged in a zigzag pattern, and of a whitish or bluish-white colour. Many of the younger girls were employed in spinning the thread from fibres of hemp; and the cloth was woven by the older women, in pieces about a yard and a half long and a foot broad; three of [p. 107] which pieces they were willing to dispose of for one dollar.

These people are called by themselves *Kibalan,* and are, I believe, known by the Chinese as the *tame aborigines,* in contradistinction to the *raw savages* which dwell on the mountains, and on the east coast more particularly. These latter are at deadly enmity with the Chinese; while the Kibalans live in close proximity, though isolated from them. An officious half-caste among them informed us that there was another village close by; so, guided by him, we proceeded about a furlong along the beach, but were rather disgusted to find it a Chinese village, differing in no respect from other dirty Chinese villages.

Returning, therefore, to the Kibalan village, the name of which I believe is *Shek-fan*, we made known to them by signs that we were anxious to visit the mountains, and to meet with the savages. They, however, did their best to persuade us not to go, assuring us that we should be shot. On showing them our revolvers, however, they seemed to think we should be safer; but when we inquired for a guide, one and all declared that their throats would be cut if they ventured among the hills. After considerable parley, the sight of a dollar induced one to accompany us, and, when, he had armed himself with his matchlock, we set out; our guide, however, taking good care to keep in the rear of the party. Crossing some padi fields, and proceeding along a sandy bay to the southward, our path was arrested by rocks, while on our right was a range of hills covered with a seemingly impenetrable forest. On closer examination, however, we discovered a beaten track, and up it we climbed, through a dense vegetation of tree ferns, camphor trees, etc., among which were some beautiful flowers, and may gay butterflies, [p. 108] although the overarching trees shut out most of the light. We ascended a considerable distance, tracing the path, which, although faint, was evident, and marking the trees as we ascended; but no trace could we find of the savages of whom we were in search. At length, finding the path less and less distinct, and time failing, we gave up the chase, and descended to the Kibalan village. The track which we had followed, however, was so evidently a more or less frequented one, that,

considering the dread professed by the inhabitants of the village of their savage neighbours, it is difficult to understand by whom it could have been used, unless by the mountain aborigines descending to the plain in search of supplies. Subsequent inquiries at Sau-o, as well as some signs made by the Kibalans, elicited the information (whether true or false) that the aborigines of the mountains could not be reached under two days' journey from Sau-o Bay.

We unpacked our basket of provisions in the middle of the village, and were soon surrounded by the entire population, who pressed curiously about us, but withal civilly; and seemed to think our eatables not bad, particularly the loaf-sugar, which young and old appeared to appreciate. Captain Bullock had brought with him some old numbers of the *Illustrated London News,* which he distributed among them; but I remarked that though all seemed anxious to get a leaf, they did not look at the woodcuts, but immediately folded it up and put it in some part of their dress -- nor could I interest them by pointing out to them the most striking illustrations, which they did not appear to comprehend. They did not, however, show any lack of interest and curiosity in most things, and the men particularly most inquisitively examined every part of our dress, feeling its [p. 109] exture, looking into our pockets, and showing by signs that they wished to see the interior of any box or bag we happened to carry. Nor were they content with looking once, but the same objects must be inspected again and again. The women more particularly exhibited a great anxiety to obtain as presents anything we could give them, particularly anything ornamental. The naval buttons were a great temptation; and over and over again they pointed to them, and intimated their desire to be the fortunate possessors of them. When denied, they would point to a young child and ask it for him, as though we could not then refuse it. Darwin, I may observe, makes the same remark when speaking of the Fuegians. If the button was given under these circumstances, it was immediately fastened on a string and tied round the child's forehead. But so importunate were they, that I might have completely stripped myself and found candidates for every article I possessed. Notwithstanding this, however, and that they repeatedly put their hands into our pockets, not a single article was lost, and no attempt was made to steal; but upon its being re-demanded, they never offered to retain any object whatever.

After our meal was over, the empty bottles were eagerly sought after, and we soon learned that no more acceptable present than *a bottle* could be made to them. This, which they called *brasco*, and *tobacco,*[3] were the only two things which they specially applied for. Nearly every one, men and women, smoked; and almost their first greeting was a demand for *tobacco,* a word which they appeared to have previously learned. A small plantation of tobacco grew and was in flower, within the walls of the village, and in [p. 110] several places the leaves were laid out in the sun to dry. It is smoked by

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[3] Both words, no doubt, from the Spanish or Portuguese, *frasco* and *tabaco.*

them in pipes about a foot long, which the woman sticks in her hair when she is not using it, and not unfrequently we observed them smoking a bundle of scarcely dried leaves, rolled up and forming a rude and uncouth cigar.

It will not be supposed, however, that they were without occupation. In many huts the men were asleep, but towards evening they might be seen with their nets wending their way to the beach. Others I observed engaged over some seething vessels, in which I found they were extracting oil from the bones of turtle. The women had, several of them, naked babies hanging to their bare breasts; others came in from the country with pruning-knives, and laden with large bundles of grass and lily straw, which they laid down to dry in the sun, and which it appeared was ultimately intended for the repair of the thatch: these women had cloths wound round their legs, as a protection while in the field, and broad bamboo hats hanging by their side for wear in the hot sun. Others were spinning thread or weaving cloth, while some were engaged in beating rice out of the husks, which they did by placing it in a hollow stone vessel, under which was placed a mat, and then two of them beating it alternately with the end of a heavy bamboo.

While some were thus engaged, the idlers allowed themselves to be amused by some of our party, who showed them little tricks, which caused hearty laughter, and which they tried their best to imitate. Seeing a revolver, they were very anxious to have it fired off, and stuck up a leaf upon a door to be shot at, which was done twice, upon which there immediately appeared two or three men armed with match-locks, who had evidently turned out at the sound of the [p. 111] pistol to protect the community in case of need. This little incident seemed to prove that they were always on the alert, and gave colour to the general report that they, like the Chinese, are subject to the raids of the raw mountain savages, against whom they are always more or less prepared to defend themselves. This was also corroborated by the fact that in the midst of the village a building was in course of construction which was evidently of a defensive character. It was in a very unfinished state, having at present no roof, and the walls not all completed; but the loopholes in the walls of the finished sides, as well as the accounts of the natives themselves, showed for what purpose it was intended. Men were engaged in sawing wood, and doing other business of construction.

By the side of this unfinished building was piled a great heap of tiles of a dark colour, and of a most rubbishy brittle character, which they had purchased of the Chinese for roofing their fort. It seemed the greater pity, inasmuch as the rocks of Sau-o Bay are of a slatey character, with very distinct cleavage; and, close by the village, slates might have been obtained by a little trouble and intelligence; and these would have answered the purpose better than the wretched tiles they were about to use. A herd of water-buffaloes, brought home late in the afternoon, repaired to a muddy pool in front of this building, and, with their characteristic timidity and stupidity, after eyeing us curiously for some time, they took alarm at some movement of one of our party, and bolting helter-skelter out of the mud, floundered over the heap of tiles, crushing

numbers of them to pieces, and all but overturned some of the native huts in their mad career. Besides buffaloes, they have pigs (always black), Chinese dogs, Malay cats with short twisted tails, and fowls.

[P. 112] The following morning a number of natives visited the ship in their boats, and, on bottles being shown to them, they eagerly demanded them. When thrown into the water, half-a-dozen men leaped after them, and vigorous swimming-matches took place for the prizes. They would also dive for buttons of any kind that were thrown in. Soon afterwards several boats, full of people of all ages and both sexes, came alongside and readily ventured on board. Indeed, one great distinction between these people and the Chinese was the entire absence of timidity on the part of the females, who, instead of running away and hiding themselves as soon as they are even looked at, showed the most perfect confidence and freedom from *mauvaise honte*. They immediately commenced eagerly inquiring for *brascos* (bottles), and as our supply of these desirable articles was limited (owing to the custom of throwing empty bottles overboard), considerable jealousy was excited among the unsuccessful competitors. There was no idea of barter, and perhaps it was our own fault that we obtained nothing in return for our valuable presents. A number of our visitors were induced to descend to the captain's cabin, where, as lunch was going on, they readily partook of the edibles, and make themselves quite at home. Captain Bullock good-naturedly cut off the tassels from his cushions, which were immediately transferred to the hair of the native beauties. After going about the ship, and conducting themselves with the greatest propriety, they returned to the village. A little incident struck me as worth recording. One of the men passing the ward-room sky-light, where some of the officers were at lunch, looked down, and lingered, when he was pulled away gently by another man who was with him. It was a slight movement, but *Chinamen* would have remained and stared till their [p. 113] eyes started from their heads before such native politeness would have occurred to them.

Mr. Sutton, chief engineer, took his camera on shore, and succeeded in taking several excellent stereoscopic pictures of the village and its inhabitants. The people readily acceded to the desire that they should sit, and several picturesque groups were formed, some of which were successfully fixed by the camera: of course it was very difficult to keep them all quiet, and impossible to make them comprehend the necessity of absolute stillness during the critical moments. The result, however, was in several instances very satisfactory.

The attempt to learn some of their words, and to form as good a vocabulary[4] of their language as the time would permit, was met by perfect good will on their part; and many words, as well as their mode of counting, were obtained, chiefly from the women, who appeared to take considerable interest in imparting the information.

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[4] This vocabulary will be found in an Appendix at the end of the volume.

Considerable amusement, too, was excited by our mistakes in pronunciation, etc., and our efforts elicited a considerable show of intelligence on their part. We found the women much more serviceable than the men for this purpose, chiefly on account of their clear pronunciation, which was decidedly more distinct than that of the men. In all cases, the attempt of the women to pronounce English words was more successful than that of the men. The word "flint," for instance, being given them, a man would not approach it nearer than *plin-iss,* while the women at once said *fil-lint.* The voice of the women was remarkably agreeable, having a plaintiveness and softness which [p. 114] were really striking, and sometimes sounded more like a gentle singing than speaking.

We looked in vain for any indication of their religious ideas. Over the door of the village, by which we entered, some one had stuck a joss-paper, after the manner of the Chinese, and probably some Chinese had done it, but there were no joss-houses or temples in the hamlet, nor did we find any in the houses, though among the poorer Chinese almost every house has a little altar to the lares in the principal room. We inquired as well as we were able of the inhabitants on this point, but could elicit nothing from them. Nor could we discover any indication of a written language.

With regard to their diseases, we had no means of learning anything of the mortality of the village. One young woman appeared to be recovering from small-pox, and one old woman was covered with a skin disease, which gave her a leprous appearance, but the people in general were healthy-looking and physically strong, hardy, and well-made. We observed no deformities among them, with the exception of one child of three or four years old, which crawled nimbly about on its hands and knees, but appeared to be physically unable to stand or walk. The village may have contained, at a rough estimate, 250 inhabitants. There were plenty of children, but old, grey-headed persons were not numerous.

In conclusion, I think it is evident that the race of people inhabiting this village is distinct from the Chinese. Among the women, particularly, there was scarcely one who had a Chinese feature, and their habits and modes of life also differ considerably. The feet were in no instance bandaged, as is universally the custom among the neighbouring Chinese. With regard to the men, it was not always so easy to discriminate, [p. 115] although in many, or rather most, instances, the Kibalan man was bigger and more stalwart, and with a cast of features superior to that of the Chinese. Some of them may have been half-castes; but I am of opinion that the majority of the inhabitants were of pure aboriginal descent, though how they became separated from the mountain savages, and the process and reason of their domestication, I have no means of knowing. Their present isolation in their own special village in a great measure accounts for the apparent purity of their blood. They were in all respects a more intelligent and more engaging people than the Chinese of Formosa, though these latter affect superiority. Thus, when I inquired of a man in the Chinese village of Sau-o, who I imagined had a dash of Kibalan in his face, if he belonged to that race, he replied, "No, I am a *man;*" (that is, a *Chinese,* not a foreigner).

On the third day we weighed anchor and stood out of the harbour; but we had scarcely got in motion when a bump upon a sunken rock warned us that the dangers of Sau-o Bay were not yet fully known. The anchor was at once dropped, and a search made for the rock, which was at length discovered 12 feet below the surface; but as we, fortunately, only drew 12 1/2 feet water, and had but little way on, no damage was done. Had it happened on our entrance it might have been more serious. This circumstance gave me, however, more time to inquire into the peculiarities of the natives of this interesting and little known spot.

Chapter VIII. The Islands North-East of Formosa.

[P. 116] Visit of a Chinese Admiral -- Ke-lung Island -- The Harbour from the Sea -- Pinnacle Island -- Craig Island -- The Wideawakes; their Breeding Place -- Geological Structure of Craig Island -- Hunt on the Rocks -- Grapsi -- Agincourt Island -- Pinnacle Rocks -- Hoa-pin-san and Tia-usu -- The Raleigh Rock -- The Dredge -- Chromodoris -- Gigantic Foraminifera -- Further Search -- Return to Ke-lung.

On our return visit to Sau-o Bay we found that a Chinese admiral was in the harbour of Ke-lung, his flagship being a gun-boat of British build. An interchange of civilities took place, and the admiral paid us a visit on board the "Serpent," accompanied by his interpreter, a young man who had been engaged by the English at Canton, and at once recognised a portrait of Captain Bate (who was killed before Canton) which was hanging in the cabin. The admiral was a jolly, though spare, elderly man, very pleasant and affable, and at the same time extremely inquisitive with regard to everything which he saw on board the English ship. He was never tired of asking questions, through his interpreter, about the fittings and tackle of the "Serpent;" but was, apparently, more particularly interested in the Armstrong guns, which he examined with great care, and the manipulation of which he watched attentively. He seemed greatly to covet our two small 20-pounders, and inquired their value. Being told that they cost 1500 dollars, or [p. 117] 120*l.* each, he at once offered to give that sum, and seemed disappointed when he was informed that Government property could not be disposed of. Having lunched with us in the cabin he returned to his ship, with many polite *chin-chins,* receiving a salute of three guns as he left the "Serpent." In the afternoon he quitted Ke-lung, saluting us with three guns as he passed, having previously sent on board a present of sweetmeats, and his card on red paper.

Whilst in this part of Formosa it was determined to search for, and determine the position of, the Raleigh Rock and Recruit Island, both of which were very doubtfully laid down on the charts. The Raleigh Rock was supposed to be seen by H.M.S. "Raleigh" in 1837, and was afterwards described by Sir E. Belcher as 90 feet high, perpendicular on all sides, and covering an area of about 60 feet in diameter. The ship

"Recruit," in 1861, sighted an island near the same spot, which was described by the master as about a mile in extent, and 600 feet high. The ship "King Lear," Captain Croudace, also describes a rock of 90 feet high close to the same locality, rising very abruptly, and having a small rock standing erect, like a pillar in ruins, detached from its north side. The possible existence, therefore, of two or three large rocks in the track of vessels, in a locality in which the reckoning was much affected by the Japan stream, was of sufficient importance to warrant an attempt to clear up the mystery, especially as Admiral Belcher had not professed to settle its position, owing to bad weather.

On the 1st June, therefore, we quitted Ke-lung harbour on the quest, for the second time; for on the first occasion, four days previously, we encountered such heavy weather on leaving our shelter, that we were glad to put back with all speed, and had received no encouragement to quit it again [p. 118] until now. Immediately outside the harbour, Ke-lung Island is a very striking object, and a fine landmark for the entrance, from which it is distant only two and a quarter miles. It is a steep conical rock, rising 580 feet above the level of the sea. I had no opportunity of landing of landing upon it, and cannot, therefore, speak with certainty as to its geological structure; but from its peculiar form, and from the fact that between it and the mainland there is everywhere 30 to 35 fathoms water, I should suppose it to be probably volcanic. I more than once passed within a mile of it, and could see no signs of sandstone; nor are there any trees upon it, as there are upon the sandstone shores of the harbour.

Looking back towards Ke-lung, one could not fail to be struck with the appearance of the coast northward of the harbour, which consists of a series of ascending strata, dipping south at an angle of 15°, and hollowed at the outcrop northwards with valleys extending as far as the eye could reach. The conformity of the lines is very remarkable, and they are continued at the back of the harbour in the distance; but it cannot be observed on the southern side.

Immediately north of Ke-lung we met with a group of three islands -- Pinnacle, Craig, and Agincourt -- little, if ever, visited, and of which no description has been given. The first of these, Pinnacle Island, is of a remarkable form, and has received the native name of the *Chair-bearers,* from the fact of the outline faintly resembling a Chinese sedan borne between two men. It is a perfectly bare craggy rock, with a tall pinnacle at either end, against which the waves dash furiously, sending the spray a hundred feet high. The rock was whitened with the excrements of sea-birds, and I had no opportunity of a close inspection.

On approaching Craig Island great flocks of birds flew [p. 119] about, making a great noise; and large white patches upon the hill-side proved, with the aid of a telescope, to be unquiet flocks of gulls and tern, in constant movement. On searching for a landing-place we observed, somewhat to our surprise, a rude hut, with a piece of blue cloth waving before it and doing duty for a flag. Seeing one or two human figures, we at first took them for shipwrecked mariners; but we soon discovered that they did

not seem anxious to be relieved from their position, and they ultimately proved to be two Chinese egg-collectors. In their huts were large numbers of eggs, but for what purpose they collected them, how they came upon the island, or how they were to get off (for they had no kind of boat) was a puzzle, and remained so, for our Chinese servants could hold no intelligible communication with them.

A tent was pitched on the beach for the purpose of taking sidereal observations; but I preferred remaining on board till daylight. The noise and chattering of the birds could be heard all night, one now and then crossing the ship; and at dawn I landed and walked through the thick herbage, laden with dew, to the top of the island. Every here and there, in a clear patch, a number of wideawakes, differing in no respect from the wideawakes of Ascension, were seated, scattered at intervals over the ground. On my approach they chattered and croaked, and made as though they were ready to run at me; but thinking better of it, they would rise with a clumsy fluttering, and take wing. They mostly perched upon the large overgrown stones, from which they rose easily; but if they happened to be upon the herbage they floundered along, vainly endeavoring to rise, until they reached the edge of a stone, over which they tumbled, giving their long wings room for extension. They were pretty [p. 120] birds, black above and white beneath, face white, beak and feet black, and tail forked. There were vast numbers of them, and it would have been easy to have taken with the hand as many as one wished. On rising, they formed a thick canopy immediately overhead, darting at our hats, and almost at our faces; so that we were under the necessity of holding up sticks and waving them over our heads to keep them off while we stooped to pick up some eggs. All this while they made various noises, chattering, croaking, and barking like a dog.

The nests of these birds were mere depressions in the ground upon the hill-side; but some of them chose the rocks, or crept into little clefts which were only just large enough to admit them. A great many of them had eggs, but I nowhere found more than one egg in a nest. These eggs were very variously marked, sometimes brown, speckled with greenish, in colour like that of a magpie; sometimes uniformly speckled with small brownish spots upon a white ground; while others again had larger blotches about the big end. They appeared to have been systematically taken from them, and many of the birds were sitting upon a small rough piece of rock.

Besides the wideawakes, there was a large number of birds of another species, somewhat larger in size and of a blue-grey and white colour, and these formed the large patches seen upon the hill-side; but they were wilder than the terns, and all flew off on our approach. These birds had also eggs, of a larger size than those of the terns, and blotched with reddish-black on a white ground.

Besides these there was a small sooty petrel, and a few gannets (Sula alba); and the only bird I observed upon the island which was not aquatic was a tree-sparrow (Passer [p. 121] montanus). On the rocks by the shore were a number of dove-coloured birds with white foreheads, of which, however, I failed to obtain a specimen; nor could I

find their nests and eggs, unless a white egg, like that of a pigeon, which I found in a crevice, were one of theirs.

The whole of Craig Island is a mass of trachytic lava, broken up into smallish rough masses, even to the very summit. These being more or less covered with grass, rendered walking over it very difficult. The blocks upon the sea-shore are very large, and piled up in picturesque confusion. On the eastern side is a series of magnificent lofty pinnacles, or aiguilles, perforated below, and thus forming beautiful natural arches, which are grand and imposing objects seen from the beach. These pinnacles appear to be portions of a trap-dyke running out into the sea. The surface of the island is somewhat disintegrated, and a poor soil is formed, upon which a large number of herbs are growing; but there are no shrubs or trees. The herbs consist principally of a succulent Saxifrage and a species of sea-cabbage (Brassica), with pink flowers; but there is no inconsiderable variety of vegetation.

On a sandy part of the shore, where the tent was pitched, we found a number of large centipedes by scraping up the sand and lifting up the stones; there were also ants, and a few hemipterous insects, and cockroaches (Blattae). I also found in other parts of the island green beetles (Euchlora), like our rose-beetles. A ramble among the great blocks of trachyte strewing the beach did not yield much, although the rock-pools formed exquisite aquaria, in which were tunicates, sea-anemones bearing a close resemblance to our Actinia bellis, rock-fish, and some sea-weeds which seemed of a brilliant blue while under water, but when taken out lost [p. 122] all their colour. Fine specimens of the barnacle, Pollicipes mitella, were wedged in clefts of the rocks; and running about hither and thither upon them were numerous active crabs, of the genus Grapsus, which are more or less characteristic of all tropical islands. They are somewhat quadrilateral in form, and have a flattened aspect, and are so wary that it is a most difficult task to capture them, more particularly as they are always found upon irregular, and often smooth rocks, over which they run with great velocity, in places where it is impossible for their pursuers to find a footing. The first pair of legs is short, curved, and spinous the other pairs usually more or less compressed, and hairy to the extremity. With these they hold securely to the most slippery surfaces. The most generally distributed species is one (G. strigosus) ornamented with long wavy lines of red and orange, and a very beautifully marked animal. Their cast shells of all sizes strew the rocks in all directions, and are scarcely distinguishable from the living animals, except that, perhaps, the tints are less vivid than those of the living ones. When taken up, however, they fall to pieces, unless great care is used. It was amusing to watch the Grapsi, which always seemed to know when they were at a safe distance, and then did not trouble themselves to move; but stir a foot, and they would scuttle away in all directions, and, if closely pursued, escape into crevices, or down gullies between the rocks, where it was impossible to follow them. I have seen these crabs not only move up and down nearly perpendicular surfaces, when undisturbed, but leap sideways over crevices several inches wide, a feat which they performed with singularly little effort, and so rapidly as scarcely to attract observation.

But my time was too limited to allow of my doing more [p. 123] than take a cursory view, and note the characteristic productions of the shore, when I was summoned to rejoin the ship, or be left, Robinson Crusoe-like, upon the island. My towing-net from the ship, however, meantime yielded a number of the little oceanic crabs with spiked carapace (Lupea pelagica).

Agincourt, the third island of this group, presents a remarkable appearance from the numerous caves in its sides, which are visible from a considerable distance, and its structure on a near inspection is easily discernible. The island is formed of a rounded hill of sandstone, with several smoothly worn eminences, and traversed from end to end by an enormous dyke of trappean rock. This dyke, best seen on the north side, is broad and nearly level, terminating in an abrupt precipice on the left, and gently sloping towards the sea on the right. It cuts off a small portion of the sandstone rock from the main mass, and in this portion are two conspicuous caves, finely and spaciously arched at the entrance, but apparently not penetrating very far back. There are no less than six caverns in the sides of this island; nor are they all confined to the soft sandstone, for while two of them are in the sandstone of the north side, and two in the sandstone of the south side, the remaining two are situated in the abrupt face of the trap cliff on the eastern side of the island. In all the sandstone caverns the arches were broad, sweeping, and symmetrical; but in those of the trap they were lofty and irregular in form, and quite distinct in character from the rest.

On the west side is a poor village, or hamlet, whose inhabitants we could see watching us; and this accounted for the fact that the highest part of the island was under cultivation, and also for the absence of the numerous birds which [p. 124] characterised the neighboring Craig Island. Agincourt was covered more or less with vegetation; but there were no trees, and only a poor apology for shrubs. The sea in the immediate neighborhood of this group has a general depth of rather more than 100 fathoms.

About 75 miles to the E.N.E. of Agincourt is the second group of islands, consisting of Hoa-pin-san, Tia-usu, and the Pinnacle Rocks, the last consisting of several distinct islets, and forming, with Hoa-pin-san, one group. Hoa-pin-san is composed of trappean rocks, with a bold outline, and rising nearly 1200 feet above the sea; while the Pinnacle Rocks well deserve their name, from the remarkable forms which the most elevated and prominent of them assume, and which look like buildings, lighthouses, &c. I did not approach them near enough to ascertain their structure; but Sir Edward Belcher[5] says, with great probability, that they are masses of grey columnar basalt, upheaved and subsequently ruptured, and rising suddenly into needle-shaped pinnacles, which are apparently ready for disintegration by the first disturbing cause, either gales of wind or earthquakes. Tia-usu also is composed of huge boulders of a

[5] Voyage of the Samarang, vol. 1. near the end.

greenish porphyritic stone, probably a basalt, cemented by coralline and amygdaloidal matter.

On none of the islands of this group are there any trees or shrubs -- they have a rocky and desolate appearance, only relieved by the multitude of birds which darkened the waters around by their vast flocks, as they sought their resting-places towards sunset. The islands, too, are more or less whitened by their deposits. The soundings around this group reach 80 fathoms. In the night we sighted at eight miles distance a rock, [p. 125] which seemed to be that of which we were in search; and, steaming up, we lay off near it till morning. It then appeared as a large irregular precipitous rock, about 600 feet long, and rising 280 feet high, with a reef at either end -- covered with sea-birds, and whitened with guano, which ran down over the ledges in long streaming festoons, giving the rock a very singular appearance. Great numbers of gannet (Sula alba) were flying around, and it appeared that they were the principal inhabitants.

The sea was unfortunately not smooth enough to enable us to effect a landing; but as the ship was drifting a short distance off to allow of taking observations, I put down the dredge in about 60 fathoms. It came up richly laden with sponges, delicate branching corals, and Gorgoniae of the richest colours -- yellow, red, green, brown, &c. -- zoophytes, tunicates, small shells, Ophiruae, &c. -- a very *embarras de richesses;* but the most interesting haul I had ever seen. There were several pretty little feather-stars (Comatulae), a little nymphon, or sea-spider, and, within the sponges, small crabs had their habitations.[6] It took a long time to search through the contents of the dredge; and so numerous were the species of animals, that, unassisted as I was, it was perfectly vain to think of doing more than select the most interesting for examination. In the midst of this mass of coral *debris*, I found a magnificent Nudibranch of a new species, but probably belonging to the genus Chromodoris. It was nearly three inches long, translucent, of a deep amethystine tint about the head, shading into reddish upon the back; all round the mantle was an edging of opaque white, while the laminated tentacles and leaf-like gills on the back [p. 126] were of a rich orange-yellow colour. A more splendid animal I had never seen, even among this surpassingly beautiful family; and notwithstanding the unenviable position from which I rescued it, it became quite lively when placed by itself in sea water. It was active and graceful, and lived several days, giving me time to describe and figure it; after which, I gave the little creature an honourable position in a series of bottles which contained my scientific novelties.

At the same spot, there came up in the dredge some curious round bodies, which might have been taken for small oyster-shells, but which were in reality of far greater interest. These were members of the family of Foraminifera -- lowly organized creatures, for the most part microscopic, but which in this case were possessed of a very definite size. The greater part of these were Orbitolites, -- round, button-like, flattened

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[6] These crabs constitute a new genus, which Mr. Spence Bate has named Spongaecetor.

shells, of a most remarkable symmetrical structure, which has been admirably elucidated by Dr. Carpenter. They were 1/3 inch in diameter for the most part, and quite white. They consist of a concentric series of alternating cells or chambers, directly communicating laterally, and indirectly in a radiating manner. This regularly-constructed calcareous framework is built up by, and is filled with, a sarcodic substance which sends out stolons through all the canals, and ultimately passes out in filaments though a series of pores along the margin, which filaments have the functions of prehension and locomotion combined.

But besides these comparatively well-known forms of Foraminifera, there were others which are at the same time among the rarest, and are the giants of their tribe. These belong to the genus Cycloclypeus, and became known by [p. 127] some speciments dredged by Sir E. Belcher off the coast of Borneo. These specimens measured in some instances 2 1/4 inches in diameter, and some of them are in the British Museum. It is interesting to observe the spread of this form fully 20° further north, in the N.W. corner of the Pacific -- for one of these great Foraminifera, 1 1/3 inch in diameter, I found off the Raleigh Rock. Its edges were somewhat broken, by being crushed up in the dredge; but what was very remarkable was that it bore evident marks of having undergone severe fracture in an earlier stage of its existence, which it had patched up, and in process of growth had become quite round and orbicular once more. In Cycloclypeus there is a great advance upon the simple structure of Orbitolites, though in outward appearance they closely resemble one another; but the cells which enter into the construction of Cycloclypeus, instead of being closely connected with one another, are singularly isolated, while the shelly covering is wonderfully elaborate, as may be seen by referring to Dr. Carpenter's figures in the Philosophical Transactions (1856).

Notwithstanding that I had already more material than I could possibly manage, I was anxious to accumulate more riches, and hoped to make more discoveries, and the dredge was again dropped overboard, while the examination of the first mass was continued. At length it was drawn up, and full of expectation I looked over the side, but alas! the handle alone came to the surface, with one scraping side still attached, but bent nearly double. It had caught against a rock, and unfortunately not being a dredge of the self-disengaging kind, a lurch of the ship had torn it in halves, and left frame, net, and contents at the bottom of the sea. I had no other dredge at hand, and it was impossible to [p. 128] replace it then and there; and had therefore for the present to content myself with the towing-net, which yielded a number of minute banded fishes, Medusae, Sagittae, and the Pteropods Cleodora and Hyalaea.

Having fixed the position of the Raleigh Rock, we then went in search of Recruit Island, or any other similar object which could have given rise to the descriptions of a rock 90 feet high, and standing on a base of 60 feet, looking from a distance "like a junk under sail." But although we went ten miles further east, and searched carefully over the position assigned in the Admiralty charts -- Belcher's, the Raleigh's, Croudace's, and

Horsburgh's, and Lyall's -- we failed in finding any sign of an island or rock; and the conclusion was forced upon us that the island I have described was at once the Raleigh Rock and Recruit Island; and this object, whose very existence had become somewhat mythical, had now taken, and would henceforth keep, a definite and authentic position upon the map of the North Pacific.

An uniform depth of 70 to 80 fathoms existed everywhere around the Raleigh Rock, and the lead constantly brought up sand, foraminifera, shells and echinus' spines. The object of this excursion being now accomplished, we returned once more to Ke-lung harbour; but only to make preparations for finally quitting it for the Chinese coast.