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"COLEOPTERA OF OLD CALABAR," ETC.



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*COLLINGWOOD'S RAMBLES IN THE CHINA SEA.**

DR COLLINGWOOD is what is popularly called "a sea-beast man." Although a botanist and a zoologist and possessed of a good knowledge of most branches of Natural History, his peculiar passion is Marine Zoology. In all the wonderful and *outré* creations, which render the aquarium so attractive, he is specially at home. It is not to be wondered at, therefore, that he should have eagerly availed himself of an opportunity to visit the shores and waters of the China Seas, nor that in his account of his voyage the denizens of the waters should occupy a larger portion of its natural history than the inhabitants of their shores.

We can hardly imagine anything more attractive to a student of Marine Zoology than such an expedition. The China Sea has been less explored scientifically than most other parts of the tropical seas, and there was not only the prospect of new discoveries but the certainty of an ample harvest of rare, beautiful, and little known species. Dr Collingwood thus glowingly describes one out of many of his experiences of this kind :—

"On the 1st of August we anchored at the edge of an extensive coral reef marked on the charts as Fiery-Cross Reef from the circumstance of the ship 'Fiery-Cross' having been wrecked thereon. The surface of the sea was perfectly smooth and glass-like, so that at the depth of 60 or 70 feet we could see the anchor lying at the bottom, among blocks of coal, as distinctly as if it had been but 6 feet from the surface. Never to be forgotten is my first ramble over this coral reef on such an afternoon. Taking a boat with a couple of rowers I left the ship and steered in search of the shallowest portions of the coral-strewn sea. A short row brought us upon a two-fathom patch, over which I allowed the boat to drift slowly, and leaning over the side and looking down into the mirror-like sea I could admire at leisure the wonderful sight, undisturbed as it was by the slightest ripple. Glorious masses of living coral strewed the bottom; immense globular madrepores; vast overhanging mushroom-shaped expansions; complicated ramifications of interweaving branches, mingled with smaller and more delicate species; round finger-shaped horn-like and umbrella-form lay in wondrous confusion—and these painted with every shade of delicate and brilliant colouring—grass green, deep blue, bright yellow, pure white, rich buff, and more sober brown, altogether forming a kaleidoscopic

* *Rambles of a Naturalist on the Shores and Waters of the China Sea.* By Cuthbert Collingwood, M.A. London 1868.

effect of form and colour unequalled by anything I had ever beheld. Here and there was a large clam shell—*chama*—wedged in between masses of coral, the gaping zigzag mouth covered with the projecting mantle of the deepest Prussian blue ; beds of dark purple long-spined *Echini*, and the thick black bodies of sea cucumbers—*Holothereæ*—varied the aspect of the sea bottom. In and out of these coral groves, like gorgeous birds in a forest of trees, swarmed the most beautifully coloured and grotesque fishes, some of them intense blue, others bright red, others yellow, black, salmon coloured, and every colour of the rainbow, curiously barred and banded and bearded, swarming everywhere in little shoals which usually included the same species, though every moment new species more striking than the last came into view. Some, like the little yellow *Chaetodons*, roamed about singly ; others in large shoals ; some were of considerable size and seemed to suck in the little ones like motes in the water ; and, in an interval a small shark about 10 feet long, swam leisurely along.

On this reef he made a curious observation, which seems to us to indicate that some sea-anemones have the power of paralyzing or fascinating fishes without actual contact. Dr Collingwood thinks otherwise, and that it is a case of parasitism, that the fish lives and takes refuge in the stomach of the sea-anemone ; but his own account of the incident seems opposed to this. In any view the observation is curious :

“By far the most remarkable circumstance I met with on the Fiery Cross Reef was the discovery of some actinææ of enormous size, and of habits no less novel than striking. I observed in a shallow spot a large and beautiful convoluted mass of a light blue colour, which, situated as it was in the midst of coloured corals, I at first supposed to be also a coral. Its singular appearance, however, induced me to feel it, when the peculiar tenaceous touch of a sea anemone made me rapidly withdraw my hand, to which adhered some shreds of its blue tentacles. I then perceived that it was an immense actinea, which, when expanded, measured fully two feet in diameter. The tentacles were small, simple, very numerous, and of a deep blue colour ; and the margin of the tentacular ridge was broad, and rounded, and folded in thick convolutions, which concealed the entrance to the digestive cavity.

“While standing in the water breast-high admiring the splendid zoophyte, I noticed a very pretty little fish which hovered in the water close by, and nearly over the anemone. This fish was six inches long, the head bright orange, and the body vertically banded with broad rings of opaque white and orange alternately, three bands of each. As the fish remained stationary and did not appear to be alarmed at my movements, I made several attempts to catch it, but it always eluded my efforts. Not darting away, however, as might be expected, but always returning presently to the same spot. Wandering about in search of shells and animals, I visited from time to time the place where the anemone was fixed, and each time, in spite of all my disturbance of it, I found the little fish there also. This singular persistence of the fish to the same spot and to the close vicinity of the great anemone, aroused in me strong suspicions of the existence of some connexion between them.

“These suspicions were subsequently verified; for on the reefs of Pulo Pappan, near the island of Labuan, in company with Mr Low, we met with more than one specimen of this gigantic sea anemone, and the fish, so unmistakable in its appearance when once seen, again in its neighbourhood.* Raking about with a stick in the body of the anemone no less than six fishes of the same species and of various sizes were by degrees dislodged from the cavity of the zoophyte, not swimming away and escaping immediately but easily secured on their exit by means of a small hand-net. Thus the connexion existing between this fish and the anemone was demonstrated, though what is the nature and object of that connexion yet remains to be proved.

“There are at least two species of these anemone-inhabiting fish, and a second species of the same genus differs from that just described in having black and cream-coloured vertical bands instead of orange and white. Such a fish I have seen; evidently related to the first-mentioned, living in a tub which did duty for an aquarium, in the possession of Mr Low at Labuan, which had been obtained from what was probably a second species of fish-sheltering anemone. This fish was remarkably lively and amusing, and of a disposition I can only describe as knowing, and lived in good health in this tub for several months—a proof that the connexion between these animals, whatever its nature, is not absolutely essential for the fish at least”—(p. 152).

Greatly to its detriment we do not doubt—as surely as the residence of an oyster in the stomach of a gastronome would be to it. This is not a case of parasitism on the exterior of the body, nor of a parasite specially framed to spend its life in its interior, nor of an animal taking occasional refuge under the wing of another like the *Pinnotheres pisum* within the valves of the horse mussel. A *Holothuria*, from the same seas, of which a figure is given in the “*Voyage of the Astrolabe*” (*Holothuria ananas*), is said to shelter a fish in this manner, and we doubt not for a similar purpose. The notodelphs and other small crustaceans, which are said to take refuge in the sac of some *Ascidians* is another parallel case. Some years since* we argued that these small animals were not guests taking refuge with a host, but victims to its appetite. We found in the sac of *Ascidea virginea* that although many of the notodelphs were swimming about quite lively, others were lying dead against its walls, and others were half digested, and we accounted for the circumstance of any being alive by the large size of the sac and the small size of the notodelphs. It might be some time before they were seized or entangled in the ciliated meshes of its walls. We think the case of Dr Collingwood's sea-anemone and banded fish quite parallel to the *ascidians* and the notodelphs. The fish were being devoured by the anemone, and the proof of

Murray in *Proc. Royal Soc., Edin.* 1858.

it is that those fishes which he routed out from the interior of its gape were languid and easily caught. The process of digestion had begun upon them, but they had not yet been deprived of life. This is our explanation of the circumstance; but there remains the curious fact of the fish hovering like a fascinated bird over the mouth of its devourer, and returning to the spot again and again after being driven off by Dr Collingwood. The distance at which Dr Collingwood describes the fish to have been from the tentacles of the anemone, independent of the fish swimming away and returning, would seem conclusive against its having been touched by the acontia or cnidæ of the zoophyte, which might otherwise have accounted for the stupefaction of the fish. Mr Gosse, in one of his books, mentions an instance in which a little fish swimming about in health and vigour died in a few minutes in great agony through the momentary contact of its lip with one of the emitted acontia of *Sagartia parasitica*; and the effects of the acontia of different species may be different, and more especially may be more powerful in larger species from tropical seas.

Dr M'Donnell at one time thought electricity might have something to do with producing the stinging effects of these acontia; he no doubt subsequently abandoned that hypothesis; but the probability of that agency being concerned in the matter should still be kept in view.

Apropos to animal electricity we observe that Dr Collingwood quotes an instance reported to him of the occurrence of electricity in a snake.

“A circumstance was told me by the colonial chaplain, Rev. J. Moreton, which, although it may seem apocryphal, I am unwilling to pass over altogether in silence. He found on one occasion, outside the verandah, a snake about five feet long, of a reddish colour, but not mottled like a boa. It had had its head crushed, that being the usual way in which the natives destroy snakes, though it is not always immediately fatal to them, for they will crawl after such an injury. Mr Moreton told me that he took the snake in question by the tail by his thumb and finger, and instantly felt a strong electric shock, which ran up his arms to both his shoulders, so that he dropped the snake in alarm. Although much surprised at the circumstance, not being a naturalist, he neglected to take any means to preserve the reptile.” (p. 173).

The nudibranchs of these seas, like the sea anemones, startle the beholder with their gorgeous and bizarre colouring. The annexed plate (fig. 1.) shews the form of some of the most striking of these; but it is unnecessary to say that their beauty is entirely lost for

want of colour. The upper one on the left, marked as from Kelung, is cream-coloured, edged with orange, and marbled with

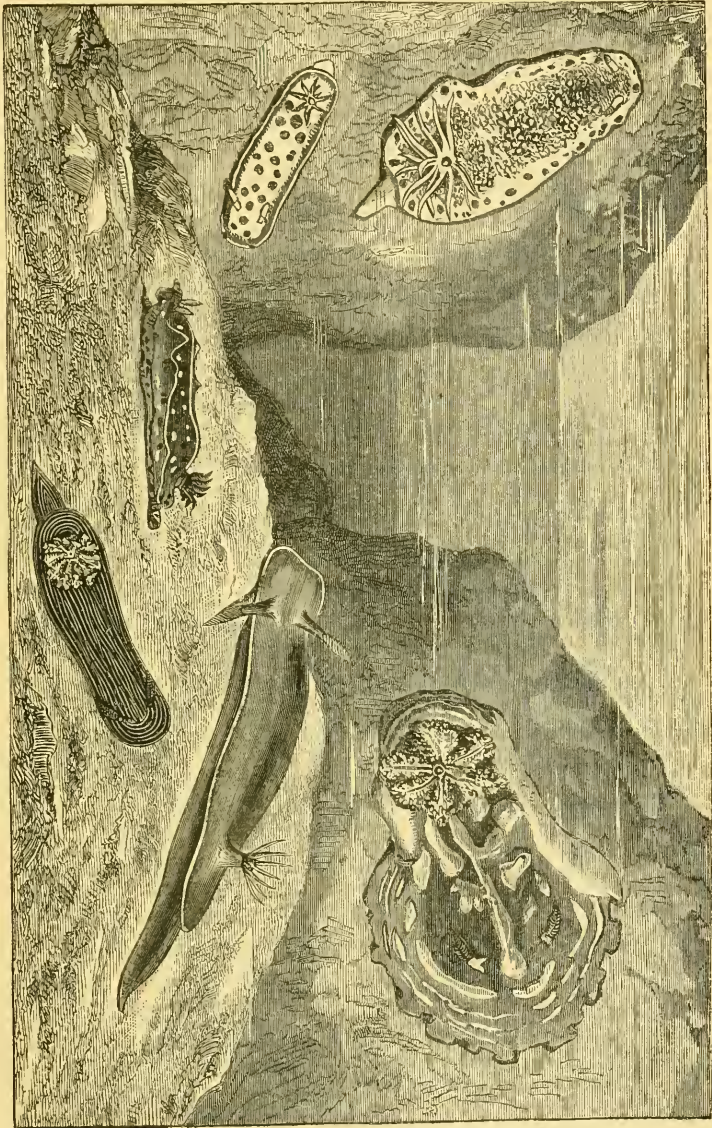


Fig. 1.—See page 360.

vermillion markings. That below it, from Haitan Straits, has a chrome margin, and is spotted with deep crimson. The next to

the right, from Makung Harbour, is deep blue, spotted with yellow, and with the tentacles and branchiæ of bright vermilion. The next from Labuan is striated with delicate alternate hues of brown and yellow. The long, smooth one from Labuan is reddish, passing into a brilliant amethystine head, and edged with opaque white, the tentacles and dorsal branchiæ orange. The last on the right, from Fiery Cross Reef, is described as reaching nearly eight inches in length, of an olive-green colour, and covered with slimy bosses and tubercles, which rendered it a most unsightly object. Most, if not all of these, are undescribed.

It would require more space than we can give to follow Dr Collingwood through the numerous other marine animals touched on by him—crabs, molluscs, fishes, star-fishes, annelides, hydrozoa, forminifera, &c. The marine zoologist will find much to interest him. A valuable paper, which had been already published in one of our scientific periodicals, on the luminosity of the sea, is incorporated with the narrative. In it the various kinds of phosphorescence are defined and traced to their origin, the number of divisions being five, viz. :—1. Sparks or points of light ; 2. a soft liquid, general and wide spread effulgence ; 3. moon-shaped patches of steady light ; 4. instantaneous recurrent flashes ; 5. milky sea. All these are traced to animal life of some kind or other, and his explanation of the phenomena is as follows :—

“ Ever since, many years ago, I became acquainted with Mr Groves’ ‘ Researches upon the Corelation of Physical Forces,’ I have looked upon that ingenious theory as the rational explanation of animal luminosity. Light, heat, electricity, magnetism, motion, and chemical force, are all interchangeable, and each may manifest itself in the form of the other ; but although these are called the *physical* forces, who can say that they are not *organic* forces also? One of them, which long since would have been regarded as eminently inorganic, is now fully recognised as an organic force produced by vital organs, and regulated by the will of the animal exhibiting it. I allude of course to electricity, an agent which is possessed by several fishes, and we know not by what other animals, a force which is produced directly through the agency of nervous power, for the regulation of which a special cerebral lobe is recognised. If this nerve force or vitality can display itself in the form of electricity, why should it not do so also in the form of light? In the more highly organised luminous animals, as in *Lampyris* (the glow-worm), in which nervous centres exist, there is a special organ for the development of light, doubtless regulated by some part of the nervous system. Kölliker, in his examination of the luminous property of that insect, came to the conclusion that there was neither combustion nor phosphorus in the case, but that it was the product of a nervous apparatus, and dependent upon the will of the animal. In others the contractility of muscular

tissue or of sarcode substance, which contractility is itself a vital act, seems sufficient to produce the phenomena in question." (pp. 407, 408.)

The nature of the phenomenon treated by Dr Collingwood is a very difficult one, and we should have liked to have had the views of such an intelligent naturalist a little more developed as to the *modus operandi* by which the luminous result is attained. No one will dispute the position he has entrenched himself in, that if all forces producing physical phenomena are correlated and convertible, it may be due to any of them. But what we should have liked to know his opinion upon is, which of them is in operation in any particular case. They may all or any of them be mixed up with it, but taking the phenomenon at a particular stage, what is its then nature. When we see the ocean apparently on fire, is the light real fire or is it not? Are the animals which give it out burning or not? Is it slow combustion by chemical action, or is it a phenomenon of electricity? It comes very much to this—Is there more than one source of light? Fire-light used to be thought different from sun-light. We now know that they are the same. Our own opinion is that there is only one source of light, and that is chemical action—in other words combustion. Combustion, indeed, is usually understood to be only another word for oxydization. Hence, where there is no oxygen, it would follow that there can be no combustion, and some examples of phosphorescent and fluorescent light seem to exist under combustions where there can be no oxydization. The light in such instances may nevertheless be due to the presence of oxygen in such small quantities as to escape our detection, or that light may be produced by some analogous phase of chemical action where something else takes the part and performs the duty of oxygen; and it seems not unreasonable to ascribe the phenomenon to one or other of them until we have better data on which to go.

Leaving such recondite physiological questions, let us turn to some of the other more palpable and material subjects noticed by Dr Collingwood. The woodcut, fig. 2, is a representation which he gives of the curious forms produced by the degradation of sandstone rocks, on the south side of Kelung harbour, in Formosa. We should have been disposed to refer the appearance to the action of the weather, but Dr Collingwood ascribes it to aqueous action. He says:—

“The effect of aqueous action upon the sandstone rocks are very conspicuous in some parts of Kelung harbour. Near the cave before mentioned, and im-

mediately 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.



Fig. 2.

But the most curious and extensive effects of the direct action of the sea are to be found at the entrance 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 on a larger scale." (p. 89.)

To what formation these sandstone rocks belong Dr Collingwood could not determine, but they are part of a carboniferous

series, which he thinks is probably of recent origin. Over them lies a bed of coal, which is worked for economic purposes, and which would be of immense value were it all equal to our British coal. But although tolerably good for domestic purposes, it does not answer for steam vessels. In fact, it would appear that it is almost as cheap to take out coal from England as to buy this coal on the spot, the quantity required to produce the same heat being so much greater of this Formosan coal.

Dr Collingwood visited another bed of coal in Borneo, which cropped out from beneath a thick layer of vegetable mould. He speaks of it as indifferent looking, and it would rather appear that although plenty of coal is to be found in that region, it is probably all tertiary, and although useful for domestic purposes not likely to be of much value to our shipping.



Fig. 3.

While in Borneo he passed some time at Sarawak. The accompanying cut (fig. 3) shews the picturesque character of the Malay houses there. He also took a trip up one of the rivers among the Dyaks, and visited one of the stalactitic caverns which are known to exist there. It is known that some of these caves are ossiferous, and probably in no part of the world is there a more interesting field for palæontological discovery than in them. It might help to clear up the curious problem, why such an extensive country as Borneo should be almost entirely destitute of larger mammals. Dr Collingwood puts it thus :—

“It has been remarked that large quadrupeds bear no proportion to the luxuriance of vegetation of the tropics, and the greatest herbivorous animals

abound most where the soil and climatal conditions do not encourage the greatest development of vegetation. Thus it is in Borneo, where, although the country is a vast forest under an equatorial sun, large animals are rarely met with."—(p. 216.)

The fact, as regards Borneo, certainly is as here stated ; but we cannot agree with the generalization as to some connexion or relation existing or being to be expected between the amount of vegetation and the presence or absence of larger mammals in any land. The two things have nothing whatever to do with each other, and the presence or absence of every kind of animal solely depends upon whether the land in question at its appearance above the sea was in connexion with or near to some other land where such animals existed, so as to allow of its being peopled by emigration or dispersal from it. The special puzzle with regard to Borneo is, that while it is abundantly peopled with arboreal and aquatic mammals, such as bats, monkeys, squirrels, otters, and tapirs, there is an almost entire absence of animals which require solid ground for the sole of their foot to rest on. A semi-arboreal tree cat or leopard, and a small light-footed deer is the nearest approach to a truly terrestrial animal. With these exceptions, and even these, perhaps, can scarcely be truly called exceptions, there is nothing mammalian on Borneo which could not live on a half-drowned land. If we suppose Borneo formerly entirely flat, as the greater part of it still is, and united to Java, and then sunk until it became level with the sea, like some parts of New Guinea at this moment, where there are groves of mangroves growing on the flat muddy beaches, extending backwards for several miles into the interior, before the solid land is reached, we should have a land covered with timber, in which all the arboreal and semi-aquatic species might live for long ages, but in which the larger animals of Java, such as the elephant and rhinoceros, could not possibly survive. The elephant no doubt now occurs in Borneo, but, as is rightly said by Dr Collingwood, it is not aboriginal but introduced. The date and history of the introduction is perfectly well known. It was by the Sultan of Sooloo, who received some elephants as a present from our own East India Company, and finding them troublesome and expensive to keep, turned them loose in Borneo, where they have bred and multiplied. From time to time it has been said that the rhinoceros also occurs in Borneo, but no well-authenticated instance of it has

ever been recorded, and the belief among naturalists is almost unanimous that it does not exist in Borneo. Dr John Edward Gray indeed has, during the last season, given Borneo as the habitat of a new species of rhinoceros, which he has described in a paper read to the Zoological Society. But neither the species nor the locality will stand much scrutiny. It would appear that Dr Gray has lately had occasion to examine in detail some of the skulls of larger mammals which are stored in the British Museum, and on comparing the series, he has found some which do not quite correspond with the rest, and instead of considering these, as has hitherto been the custom, as abnormal specimens or variations from the type, he has arrived at the conclusion that they are distinct species. Thus in comparing the skulls of the tapirs, he found one marked "Tapirus Americanus, from South America," in which he thinks the "position of the internal nostril on the palate," is so different from that of the common South American tapirs, as at once to separate it from them, and he has consequently described it as a new species "not yet observed in the living state," and given it the name of *Tapirus Laurillardei*.

Next, dealing with the rhinoceroses in the same way, and increase of appetite apparently growing by what it feeds on, he has doubled the dose this time. He gives us two new species of rhinoceros also "not yet observed in the living state," which he has described under the names of *Rhinoceros Floweri* and *Rhinoceros nasalis* from skulls in the British Museum—the former from Sumatra and the other from Borneo. As to the value of these new species this is not the place to give an opinion. When we mention that Professor Owen considers Dr Gray's characters as merely individual variations, we imagine that few of our readers will require one; but as to the locality of Borneo it is of importance to the present question, and, being a matter of fact and not of opinion, there can be little difficulty in settling it. The locality is given by Dr Gray broadly and distinctly in his diagnosis simply as "Borneo" without query or qualification; but on looking to the particulars of where it came from and how it came (which it is but justice to Dr Gray to say he always gives with scrupulous fidelity so far as they appear to him to be relevant), we find to our surprise that he has no warrant at all for saying that the species is from Borneo. No one has told him that the skull belonged to a Bornean animal. It turns out to be a mere inference on his part.—"The skull was

purchased of a dealer, who said that he received it direct from Borneo." Even the dealer does not say it is a Bornean specimen. We all know how a collector gathers from all quarters as he moves along, and when his store is large enough, ships them home from the last port he comes to. Are all that have been so accumulated to be held as having been natives of the port of shipment? Because this skull was shipped from Borneo does it follow that it was killed in Borneo? In these seas the communication is so frequent and easy between the different islands, that special caution in ascribing a locality is necessary; and as if to warn Dr Gray from the blunder he was falling into, he found another skull in the British Museum collection, marked from Java, possessing exactly the same abnormalities as he gives as the characters of his supposed Bornean species.

Dr Gray gets over this difficulty by the conjecture that the locality Java may possibly be a mistake for Borneo. "It was purchased of a dealer, and has been marked *R. Sondaicus* Cuvier Java, by some previous possessor. The habitat may depend on the person having decided it to be *R. Sondaicus*."

Had the facts been reversed, and the skull been labelled "Borneo," we might have accepted the conjecture that Java was meant, seeing that that would only be reconciling the facts to all that we previously knew on the subject. But Dr Gray's proposition asks us to run counter to all our previous knowledge, merely for the sake of supporting his new quasi Bornean species—one of whose chief titles to confidence depends on its being a native of the new locality. We have no desire to prejudge the question. The rhinoceros *may* be a native of Borneo—the skull said to have been received direct from Borneo *may* have been so received, and the animal that bore it *may* have been killed in Borneo, and it *may* have been by omission that it was not stated to have been killed there—the skull labelled Java *may* have been so labelled by mistake, and *may* have come from Borneo—Dr Gray's new species, *Rhinoceros nasalis*, *may* be a good species "not yet observed in the living state"—and variations in the nasal bones *may* furnish sufficient characters by which to discriminate species; but we think until some or all of these possibilities shall have been proved to be facts, it would be rash to conclude that the rhinoceros is a native of Borneo.

Leaving the larger species out of view, Borneo possesses many remarkable mammals. One of the most interesting of these is the

Galeopithecus Philippensis, which although not confined to Borneo is abundant there. It is particularly interesting, from the mixed affinities which seem to be combined in it. It may be described as a mixture of the monkey and the squirrel, and its habits bear out the suspicion of the affinities which its form suggests. Although placed by systematists next to or among the quadrumana, it has in many of what may be called its minor characters, strong sciurine elements. We shall contrast its mode of flying from tree to tree, as narrated by Dr Collingwood, with a short account of a similar propensity of the flying squirrel in North America given by Sir Charles Lyell in his tour through America; and we think the reader will feel disposed after reading them to allow a greater share of the squirrel element to be present in the Galeopithecus than he had perhaps previously been disposed to admit.

First hear Dr Collingwood :—

“Sitting in the verandah of Mr Martin’s house about sunset, I had an opportunity of observing the habits of the flying squirrel (*Galeopithecus*) the *Kerbong* of the Malays. The animal came streaming through the air from a distant clump of trees, its flank membranes extended, and its long tail stretched out behind, and with a graceful sailing motion at length arrived at a tall tree trunk which had been left in the midst of the cleared jungle, on the lower part of which it alighted. The animal then began to ascend the trunk in a spiral direction, running a little way at a time and then stopping. Having reached the branches it selected one, along which it crept until it had reached the extremity, when it suddenly launched itself into the air, and glided away on outstretched wings in the direction of another tall tree, about 150 yards distant, gradually descending as it proceeded, and finally alighting upon the lower third of the trunk. Again it crept up the branches, and again it cast itself off, making this time for a more distant tree, when it was lost to view in the jungle. At the same moment another *Galeopithecus* arrived at the first-mentioned tree, which standing alone, offered a good mark and a convenient resting place for these singular animals. This one repeated the same process, only going in the opposite direction. Every evening at the same hour, these animals, probably the same individuals, might be seen making use of the same trees in their flight so that it was easy to say when they had alighted anywhere what would be their next flight. Having reached the highest part of the tree, they sailed steadily away to the next, with grace and swiftness, in a gradually falling line, with no apparent movement of their flank membranes, but with the evident power of accurately guiding their flight to the next stage in their progress, which may thus be described as a vertical zigzag.” (p. 211.)

The notice of the habits of the North American squirrel, by Sir Charles Lyell, to which we refer, is as follows :—

“After travelling so much in the woods, I had never got sight of more than three or four species, owing, I am informed, to their nocturnal habits. I

regretted that I had not yet seen the flying squirrel in motion, and was surprised to hear that Dr Buchanan had observed about a hundred of them every evening for several weeks, near Philadelphia, on two tall oaks, in the autumn when acorns and chestnuts were abundant, and when they had spare time to play. They were amusing themselves by passing from one tree to another, throwing themselves off from the top of one of the oaks and descending at a considerable angle to near the base of the other; then inclining the head upwards just before reaching the ground, so as to turn and alight on the trunk, which they immediately climb up to repeat the same manœuvre. In this way there was an almost continuous flight of them crossing each other in the air between the two trees.”—(*A Second Visit to the United States*, by Sir Charles Lyell, p. 303.)

Before leaving the zoology of Dr Collingwood’s book, we shall just quote one suggestion for the obtaining of small birds:—

“The Klings” (a race from the Coromandel Coast of India, of whom considerable numbers are settled about Singapore) “here have a mode of obtaining small birds which might prove useful to the practical ornithologist. I have more than once seen one of them beneath a Banyah, armed with a straight tube or sumpitan about six feet long, and a piece of soft clay, from which having broken off a morsel, he rolled it into a little ball between his hands, then placing it in the tube and taking aim at a small bird singing in the branches above, he noiselessly blew the pellet, and down fell the bird to the ground, stunned, or it might be killed. A little practice, one would imagine, would enable a performer to play upon this instrument, not wantonly, we would hope, but for the purpose of procuring small birds when they are required for preservation without injuring the plumage.” (p. 267.)

We can endorse Dr Collingwood’s suggestion, and say, from personal trial of the South American blow-pipe, that a moderate degree of skill is not difficult to attain.

Dr Collingwood saw the diamond mines, or rather diamond washings, in Borneo. For the most part diamonds are of small size, but of a brilliant water, although large ones have been occasionally met with. The largest Bornean diamond belongs to the Sultan of Matan, and is valued at £269,738, weighing as uncut 367 carats. In the sand and gravel of the river bed, at depths averaging from 6 to 18 feet below the surface, and in strata sometimes several feet thick, the diamonds are sought for with varying success by a large number of Malays, who sink shafts at a distance of 20 feet apart in the shallow parts of the river. They construct huge pyramidal frames of large and strong bamboos, about three yards square at the base, and by means of heavy stones they sink them upon their claims, so that they may not be carried away by the stream, and at the same time shall point out clearly the working place of each party. Their next important stock in trade

consists of a number of large shallow round wooden bowls. Filling a bowl with gravel from the river bed, they (standing in the water) hold the bowl, just skimming the surface, and give the contents a rotatory motion, cautiously and skilfully allowing the muddy and lighter sandy particles to flow over with the water, until nothing is left at the bottom of the dish but the larger and heavier sandy and gravelly substances, which are then carefully examined for the diamonds.

We have left ourselves scarcely any space to speak of Dr Collingwood's observations on the vegetable products of the countries

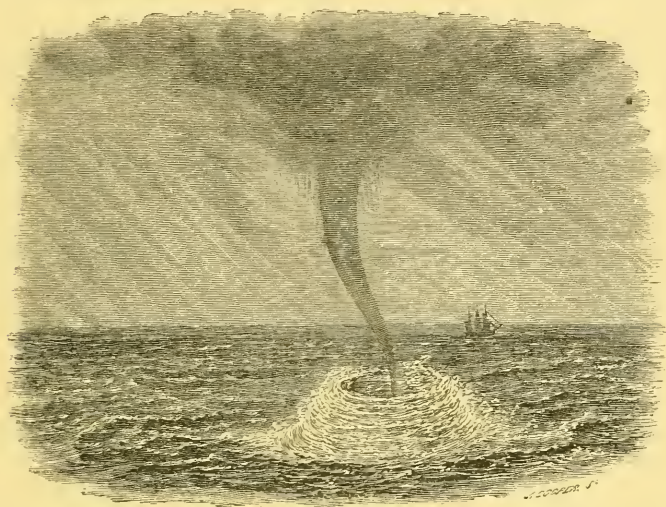


Fig. 4.—Water Spout in China Seas.

he visited. The most important part of these is perhaps his notices of what is doing commercially in the cultivation of the different useful plants, such as coffee, cotton, cocoa-nut, sago palm, pepper, sugar, nutmeg, gamboge, gambir, &c. He has noted the advance making in the cultivation of these with an observant eye—and those interested in them will find some useful incidental information. Of purely botanical information there is not a great deal. The following observation on the behaviour of the sensitive plant, although not new any way, may interest the general reader:

“One of the commonest roadside plants of Singapore is the sensitive plant (*Mimosa sensitiva*), which grows in profusion in waste places, and on banks by the wayside. It is a very low spreading plant, of suffruticose habit, seldom

rising higher than the grass among which it grows, or more than six inches from the ground, but covering large spots, which are distinguished from the rough herbage by its neat regular foliage. It seems to be almost constantly in flower, for in October, November, and May, I noticed numbers of the little round tufts characteristic of this acacia (mimosa), and of a pale flesh colour. The manner in which the aspect of such a little bush is altered by a touch is very remarkable. Brush your foot over the luxuriant little plant as you pass by, and the whole bush seems to disappear, and you look back for it almost in vain; the leaves have all closed up, and the stems become depressed, and nothing is left but a few withered sticks on the grass. Try to pluck a sprig and it fades between your fingers; so that it is very difficult to gather and examine it in an expanded condition. But if you will carefully take between the finger and thumb the pulvinus or swelled base of the leaf stalk where the little thorns are situated, without touching any other part, and pinch it hard before attempting to break off the sprig, the pinnae will remain expanded relax your hold, however, and they will immediately begin to close up.”— (P. 257.)

The natural physical phenomena of the world were not overlooked by Dr Collingwood, and we cannot better indicate his attention to them than by closing our views with an engraving of a waterspout (see p. 377), copied from a sketch carefully taken by himself, and which tells its own tale better than any words could do.

A FORTNIGHT'S STAY ON LOS FARALLONES.*

IN the month of May 1851, when California was still in its infancy as a state of the American Union, I was a resident of San Francisco. One morning the captain of a British ship, then in the harbour, with whom I had some acquaintance, came to me with an excited face, and said he wished to propose a speculation.

"Well, Captain, you know we are all ready for anything that will pay ; let us hear what it is."

"Yes ; but first you must promise that if you do not *go in* yourself, you will not say anything about it."

Having given the required assurance, he said, "You know what a price eggs are."

I laughed, and admitted that I knew what I had to pay for a boiled egg for breakfast.

The captain nodded, and looked wise, then drew from his pocket a large green egg, beautifully spotted, streaked, and speckled with black.

"Look at that. I know where we can get a shipload of them for the picking up, and if you will provide a small vessel, I will take her to the spot, and with the assistance of my brother and one or two others, load her in a week."

"That is all very well, Captain, but when we have got the eggs to San Francisco, what can we do with them—who will buy that kind of egg?"

"Oh," laughed the Captain, rubbing his hands in great glee, "never fear but we shall sell them fast enough. I got the information from a townsman of my own, who owns a whaleboat here. He has already tried the spec himself, and sold his cargo to the restaurant folks for omelette eggs at a dollar a dozen."

Omelette eggs were already pretty well known in San Francisco, for, owing to the great scarcity of poultry, eggs had been imported from the coast of Mexico, Peru, and Chili—aye, and even from Boston, packed in various ingenious manners, but, nevertheless,

* The Farallones are a group of rocks near the mouth of the Bay of San Francisco.

arriving in such a condition that they could hardly be called fresh eggs, yet still, when disguised with onions and "fines herbes," were available to the restaurateur for omelettes.

My friend the Captain, then informed me that the egg he shewed me was a murr's egg, and that these birds were then laying in thousands upon thousands on the "Farallones," a small group of islands rising abruptly out of the sea, some twenty-five miles west from San Francisco.

In those early days of San Francisco, we were all full of life and energy and love of adventure, and the prospect of a week's bird's nesting on this gigantic scale promised amusement as well as profit, so I first had the egg boiled to ascertain its merits, and on finding that it was as good as a fresh duck's egg, and infinitely preferable to the "omelette eggs" already mentioned, agreed to provide a small schooner for the expedition, and determined to form one of the party myself.

The Egg Company was *limited* to the Captain, his brother, another sea captain, a young friend of mine, and myself, and the crew consisted of the captain's cabin boy.

We took some provisions and a keg of fresh water on board, and sailed with the evening's tide. There was but little wind, and we did not sight the "Farallones" until the next morning.

Leaving the eggs out of the question, the rocks were worth coming to see for themselves alone. From the midst of the waters, a mass of rock rising in the centre, like a gigantic steeple or lighthouse. On the shelving rocks, sloping towards the sea, thousands of birds, their white breasts looking like a large bed of flowers; to the right of the principal island, and only separated from it by a very narrow strait, another huge, hump-backed rock, literally covered with birds, while the air was filled with shrieking sea-gulls. We had difficulty in finding a safe landing-place, but finally discovered a little narrow sandy cove, with a whaleboat in it—the whaleboat of our captain's friend. Here, then, we anchored; and landing in the ship's boat, each provided with a basket, commenced operations. We were soon busily employed amongst the eggs, and found them in such profusion, that it was clear we should easily load the little schooner. But the interest of the trip did not end there. We had the island to explore, and make acquaintance with its population.

We found that there were three men on the island, all on the same errand as ourselves, one of whom was our captain's friend of

the whaleboat. There were three or four rude huts built of rough stone, by Russian whalers, who formerly frequented the island for the sake of the seals and sea lions, which were said to have been at one time abundant there. These huts must have been long abandoned, for the floor was overgrown with grass, and of the roof there was very little left. During our stay one of our party shot a seal, the skin of which must have been of considerable value, as the fur was beautiful, but that was the only one we saw. The sea lions, however, were plentiful enough, and were fond of reposing on some flat ledges of rock, and basking in the sun with their young calves. I am aware that the sea lion is only a local name for these animals, but I do not know the correct name. They are in shape like a seal, but are destitute of fur. They are clothed with coarse yellow hair, not unlike pig's bristles, and their length is ten to twelve feet. One of the whaling party killed one of these sea lions, and, wishing to present the skin to the infant Museum in California, I got permission to appropriate it, and began to skin it with the assistance of one or two others of our party. We quickly had the uppermost side laid bare, but an unforeseen difficulty prevented our completing the task. The united strength of our whole party was insufficient to turn the beast over, so we were obliged to abandon the skin. We captured, however, two little calves, and put them alive on board the schooner; pretty little creatures, with fawn-like eyes.

We had been nearly a week on the island, and the hold of the vessel was more than half full of eggs, when a gale of wind arose, and the captain fearing a storm, thought we should pass the night more comfortably in one of the huts, instead of sleeping on board, as we had always hitherto done. We cast the other anchor, and moored the vessel as securely as we could. We then brought our keg of water and a day's provisions on shore, and made ourselves as comfortable as circumstances would allow.

The next morning the captain went out early, and in about a quarter of an hour returned with a very dismal countenance, saying,

"Well, here's a pretty go."

"What's the matter, Captain?"

"Why, she's gone!"

"Who's gone?"

"Why, the schooner to be sure, eggs and all."

There was a dead silence for a minute, and we looked at

each other with bewildered countenances, until our position struck one of us from the ridiculous point of view, and he burst into a loud laugh, which was infectious, and became general. There was not much to laugh at, however, for we were really castaways on a desert island. True, there was plenty to eat for the gathering, although not much variety, but our supply of water was very small, and we had not yet discovered any spring on the island. What was to be done was the next question. The whaleboat was our only means of escape, so the two seafaring men volunteered to row to San Francisco, as soon as the storm abated, and bring another vessel, whilst, in the meantime, we who remained were to gather a fresh cargo. There was no difficulty in getting the loan of the whaleboat, and our captains took their departure.

We did not find our solitude at all unpleasant, and became every day more pleased with the place and its inhabitants. I watched with interest the habits and peculiarities of the different birds.

The murr (as our captain called it) is the foolish guillemot. It lays its solitary egg on the bare rock, without any attempt at building a nest, not even a stick or a straw, but is not the less careful and attached to them, of which we saw plenty of instances. The sea gulls were flying round in great numbers, and the moment they saw an egg without the protection of the mother they pounced upon it, flew off with it to a little distance, dropped it on the rocks to break the shell, and immediately gobbled up the contents..

One day I was watching this little game, when I saw a gull hovering round a guillemot who was sitting on her egg. The gull emboldened by success thought to take the egg from under her. She drew back her neck, watched her opportunity, and with a sudden dart of her sharp bill, stabbed her enemy to the heart. I took up the dead bird, and found it had been pierced just under the wing. We cooked the gull as we were getting tired of nothing but eggs, eggs, eggs, for breakfast, dinner, and supper, and very good eating it was, entirely free from the strong fishy taste that almost invariably attaches to these birds, affording a curious exemplification of the influence food has on the taste of the animals we eat. *Mem.*—Egg-fed gulls are not fishy.

As another variety to our bill of fare, we found a bed of large mussels on the rocks, poor stuff, but acceptable as a change.

Unfortunately our keg of water gavè out ere long, and we could

only discover a very small spring of water, so thoroughly impregnated with guano, that even after being boiled and allowed to settle, it was very strong, although I conclude not unhealthy, as none of us suffered any bad effects from its use. Besides the guillemot, there were other birds laying on the island. First there were the gulls, but they do not lay in the profuse and promiscuous manner of the guillemot. We had to search for their nests. They were generally to be found in little cozy nooks, where the detrition of the rocks had formed miniature valleys. The nests were neatly constructed of dry grass, and usually contained three eggs, sometimes two, rarely four. These eggs were very different from the others. Smaller than a hen's egg, of nearly the same shape, of a light olive-brown colour, sprinkled profusely with streaks of a darker shade, and with a very thin shell. As an article of food we soon discovered their superiority, and during our sojourn on the island used none but them.

Next, there were the puffins, or sea parrots, as our sailors called them. They build their nests, or rather I should say they lay their egg (they lay but one) in crevices, or holes in the rocks, sometimes so far in as to be beyond reach. These puffins very much resemble those which come to breed on the small islands off the coast of Wales and Scotland (in which latter country they are called coulternebs or Tammie Norries), but are more beautiful, inasmuch as they are adorned by a long silky tuft of a golden yellow, on each side of their head. The egg is white, and nearly round. On one occasion I ventured to put my hand into a hole, when the bird was on its nest, and got a terrible bite for my pains. Their beak is very strong indeed, designed, I believe, for cracking mussel shells, and admirably adapted for the purpose.

Then there were the shags, but they built their nests on the very summit of the highest pinnacle in the island. This abode looked inaccessible from below, but I scaled it without much difficulty, and found on the top a platform, on which there were several nests of these birds. The nests were very large, and shabbily constructed of sticks and sea-weeds. In one there was a brood of young ones, fledged, and nearly ready for flight, or I might perhaps better say, ready for sea. In the others there were eggs, varying in number from five to seven, white, and not much larger than a pigeon's egg: this struck me as strange, for the bird is much bigger than the guillemot, whose egg is larger than a duck's.

I only took a specimen of the eggs, as they did not seem to be

worth much, but I thought one of the young birds might do for supper, so after a fight, in which he defended himself bravely, I got one by the neck, and carried him home, if I may be allowed to call our temporary refuge by that sacred name. The bird was tender enough, being young, but I am afraid his parents had reared him on fish.

There was another bird that we frequently saw on the island, but we never discovered its nest, if indeed it had any at that time. The captains called it a sea pigeon: it somewhat resembled a common pigeon in colour and shape, and in its red legs, but it was more slender and web-footed.

We found several skeletons of the pelican, but saw none of the living birds. I suspect they must be migratory, as I have often seen the live birds in the bay of San Francisco. They are smaller than the pelicans we used to see in Wombwell's Menagerie, and grey instead of yellow or white.

I think I have enumerated all the live stock we saw on the island, with the exception of the common domestic cat, of which there were dozens existing in a wild state, their ancestors having no doubt been left by some whaling vessel.

A fortnight after our first arrival our captains returned with another small vessel, in which we quickly stowed what cargo we had collected, and immediately returned to San Francisco. We counted out a little over 1000 dozen, and sold them all to one man at a dollar a dozen.

W. MURRAY.