

the nerves of the animal body of the chemical affinity evolved as electricity from a few square inches of decomposing zinc, it may well be contended that the energy of chemical affinity evolved from so great an area of decomposing organic substances cannot be innocuous, and that the fact of its action not being acknowledged by the subjective sense of feeling is no proof that it is non-existent.

Thus it becomes conceivable how the energy evolved in the Soonderbunds may, when vapour-borne across the interval, affect the inhabitants of Oude, and so alter the individual condition as to admit of local causes producing foreign effects.

Many of the most careful observers have asserted that malarious fevers arose from chill; yet, while this did not solve the question, it at least established one fact, that malarious fevers arose under circumstances which necessitated vapour condensation, one gallon of which would set free energy sufficient to melt 45 pounds of cast iron.

Familiarity with malaria will furnish many arguments in support of the contention that fever infection is at least coincident with vapour condensation. A boat's crew ashore at night on a West African station will often be affected, while those but a few miles seaward will remain exempt.

In the deep valleys of Zululand leading from the St. Lucia swamp, fever is contracted at a distance of many miles inland, while high ground much nearer to the swamp may be occupied with impunity. In the Terai, at the foot of the Himalayas, a night's sojourn brings to the unseasoned traveller certain fever, while a day journey is almost free from risk.

Since, then, the search for a material cause of cholera and of malaria has been as unsuccessful as if one sought a material cause for sunstroke, it may legitimately be suggested that, as the more rapidly fatal affection is the result of the action of direct solar energy upon the sentient nerve-endings, so the less rapid maladies may result from subordinate rates of the same energy acting upon subdivisions of the nerve-endings, which, as Dr. Goldscheider has shown, are specialised to respond to lower velocities of that force, and that the chill to which so many attribute the origin of fever is really the acknowledgment, by what Dr. Goldscheider terms "the special nerves of temperature usually cognisant of cold," of that obscure energy hitherto unregarded as a factor in the production of disease, but which the investigations of thermo-electricity may one day bring within the ken of man.

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THE CRUISE OF THE "MARCHESA"¹

THIS is one of the most interesting books of travel that it has been our good fortune to meet with for several years. Apart from its excellent maps and wealth of illustration, it commends itself by a charm of style not usually to be met with in works of this nature, and by the judgment shown in the narrative. Many countries were visited which lie in the well-beaten track of every tourist round the world, but these have not even been alluded to. The attention is riveted to the details of discoveries among little-known scenes, and sometimes in quite unexplored regions.

The *Marchesa*, an auxiliary screw schooner of 420 tons, Mr. C. T. Kettlewell, captain and owner, was commissioned in the Clyde in November 1881, and left Cowes on the 8th of the January following. She reached Colombo on April 24, having touched at Socotra and Oolegaum Island, one of the Maldivé group, on her way from Aden. From Ceylon she proceeded *via* Singapore to Formosa; and, coasting along the south-eastern side of Formosa, she visited the small Island of Samasana. While she was running nearer to the coast at Chock-e-day, the stupendous cliffs of this part of Formosa were seen rising, to a height of some 5000 feet, upright from the water's edge.

The little-known islands of the Liu-Kiu-group were next visited. These lie some 250 miles to the east-north-east of Formosa; they are partially volcanic, and lie just north of the tropic. The account of the short sojourn at Napha,

¹ "The Cruise of the *Marchesa* to Kamschatka and New Guinea; with Notices of Formosa, Liu-Kiu, and various Islands of the Malay Archipelago." By F. H. H. Guillemaud, M.A., M.D. (Camb.), &c. With Maps and numerous Illustrations. Two Volumes. (London: John Murray, 1886.)

and of the wonderfully successful visit to Shiuri, the capital, where are the ancient palaces of the Liu-Kiu kings, will be found in Chapters II. and III. Some time was spent at Japan, then the yacht's head was turned northwards for Kamschatka, and on the morning of August 13, when the fog lifted, the sharp peak of Vilutchinska Volcano enabled them to steer for Avatcha Bay, within which lies the once well-known little harbour of Petropaulovsky.

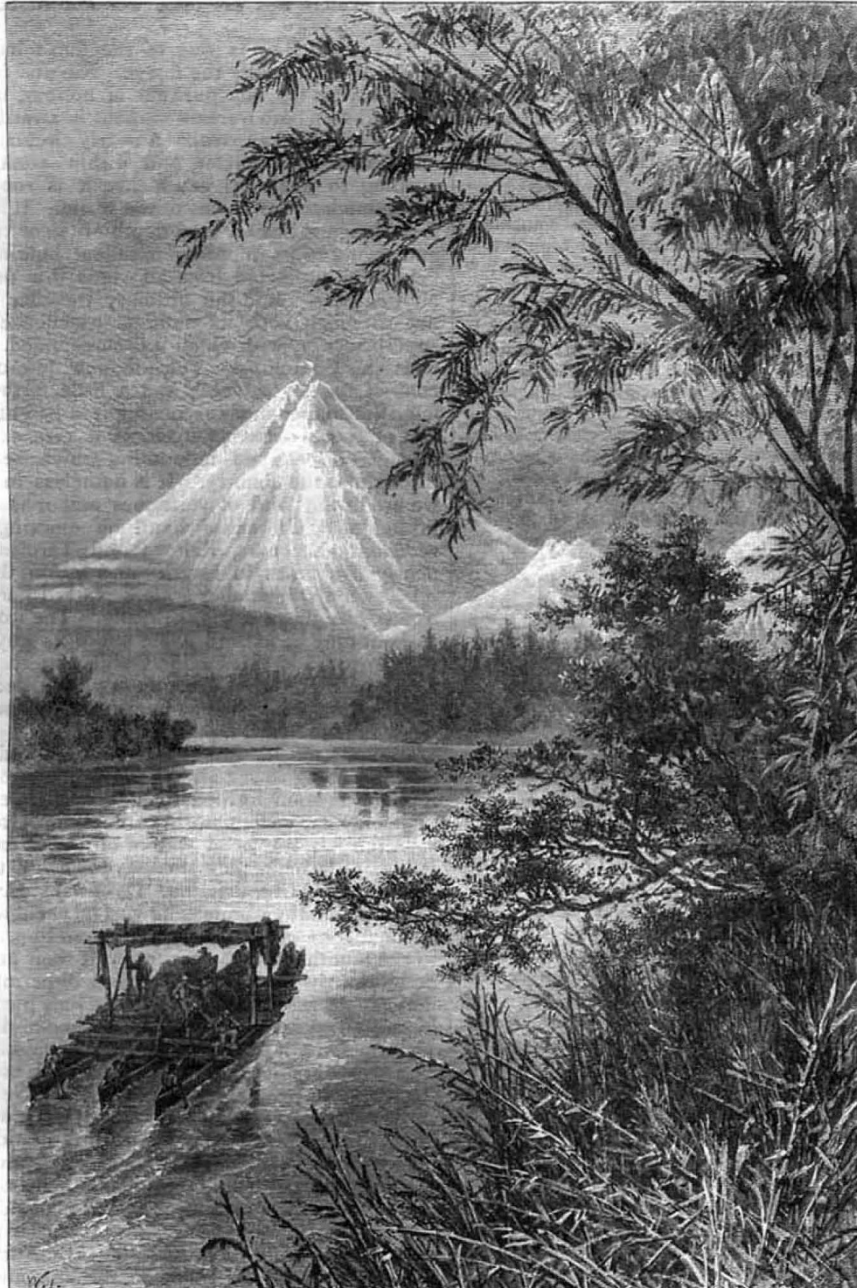
"Avatcha Bay is one of the finest harbours in the world, if not actually the finest. Rio and Sydney have no mean claims for this position of honour, but those of us who had seen both were unanimous in awarding the palm to their Kamschatkan rival. A nearly circular basin of some nine miles in diameter, and within a narrow entrance opening to the south-south-east, it is roomy enough to accommodate the navies of the world. It is entirely free from dangers, has an even depth of ten or twelve fathoms, and owing to its affording excellent holding ground and being well protected from all winds it is perfectly safe in all weathers. But the ordinary traveller will be struck not so much with its nautical excellences as with the superb scenery with which it is surrounded. To the south rises the Vilutchinska Volcano, now quiescent, a graceful cone of about 7000 feet; and a little farther eastwards a huge flat-topped mass exceeding it in height by a thousand feet or more obtrudes itself, as a rare exception to the rule of cone-shaped mountains which seems to obtain throughout the country. It is nameless in the charts, for we are in the land of volcanoes and it is only 8000 feet in height! On either hand on entering are the two secondary harbours, Rakova and Tareinska—the latter nearly five miles in length—and within them again are others on a still smaller scale. Nature here at least has treated the mariner right royally. The iron-bound coast without may be as bad a lee shore as any skipper need wish to see, and the Pacific Ocean may too often belie its name, but here he can rest quietly, and sleep *sur les deux oreilles*, until such time as he weighs anchor for the homeward voyage" (vol. i. p. 67).

In spite of its imposing name, it did not take the explorers long to see all the sights of Petropaulovsky, and a plan was soon formed to make an expedition into the interior. Travelling northwards from Avatcha Bay, they soon struck the head waters of the great Kamschatka River, on which they floated down to the sea. The well-known naturalist Dr. Dybowski gave them great assistance in their undertaking. The yacht was to remain in harbour for some six weeks, and then to proceed, as it did, to the mouth of the river to await their arrival. Of this delightful river journey our space will permit us to give no details. As far as Narchiki, where they met the river, they journeyed on ponies, and then they floated down its stream, sometimes in boats, sometimes on rafts, until, after many an adventure, and, indeed, many a trial, they reached Ust Kamschatka in safety. In places, the river swarmed with salmon; bears were in abundance; the weather, though not always of the best, was generally bright and clear; but the natives were very difficult to deal with—always exorbitant in their charges, and often placing the travellers in sad dilemmas; and constant rows took place about the hire of the canoes. One morning, after a harder fight than usual with the Mashura men, with much time and some temper lost, they came in sight of the magnificent range of volcanoes on the lower reach of the great river. The five already-known volcanoes have elevations of from 11,700 to nearly 19,000 feet, and there were two much lower cones, now first described, which they called after Gordon and Herbert Stewart. The account of the travellers' first view of these mighty peaks must be told in their own words.

"We floated silently down stream for a couple of hours or more, thinking over the discussions that we knew only too well would be renewed at the earliest opportunity,

when turning a sudden corner we found ourselves face to face with a view that banished all thought of past and future annoyances in a moment. Before us, eighty miles or more away, stood one of the grandest groups of volcanoes in the known world. Others there are, it is

true, that are higher, although in most cases the elevation of the ground from which they take their rise detracts in no little degree from their apparent height. But here, from a base elevated scarce a hundred feet above the sea, a series of cones of the most exquisitely symmetrical shape



The Volcano of Kluchefskaya.

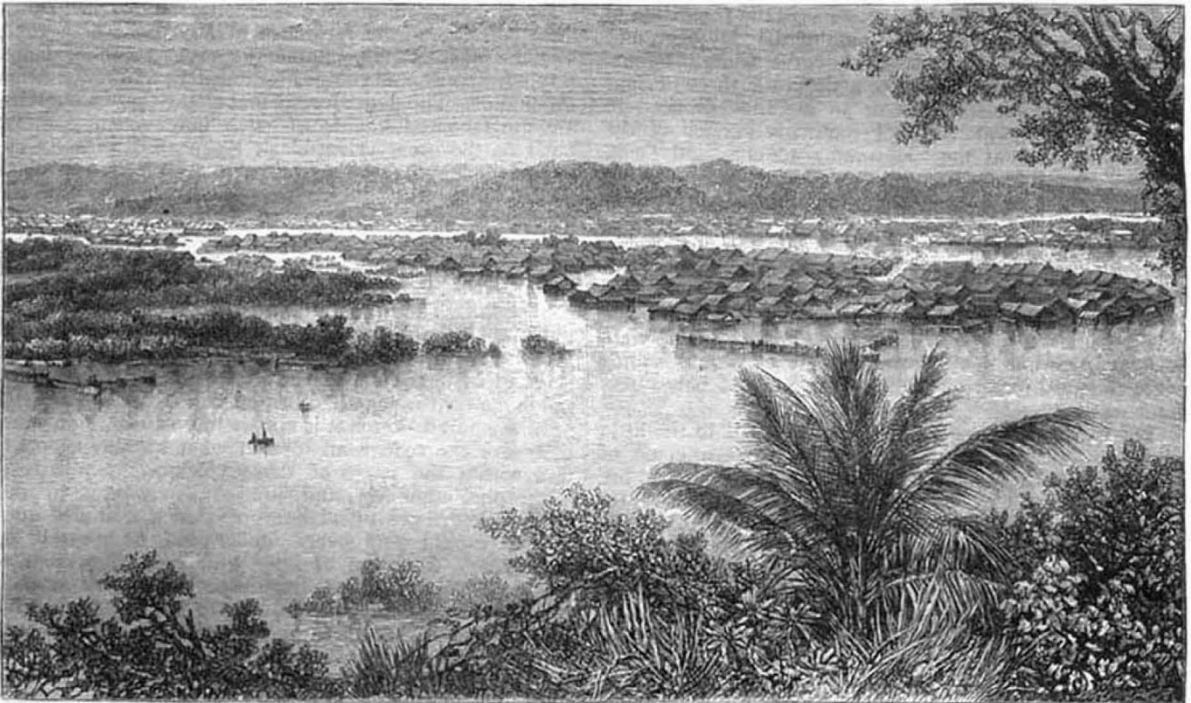
rose in heights varying from twelve to seventeen thousand feet. They were three in number. Nearest us was Tolbatchinska, dog-toothed in shape, with its apex on the western side, a long thin puff of white smoke drifting from its shoulder; and beyond, apparently in close prox-

imity to one another, rose the twin peaks of Kojerevska and Kluchefskaya, perfect in their outline, pyramids of the purest snow, before which one felt how poor was all language to express the sense of their perfect beauty. Snow mountains were no novelty to us. We had seen the

Andes and the Alps, and had watched the sun rise on Cotopaxi, on Etna, on Fujiyama, and a dozen other mountains of equal note. But here all questions of comparisons would have been a sacrilege; and floating noiseless over the unruffled surface of the river, we sat spellbound drinking in the view. The sun sank slowly as we crept along, and slope and peak, at first a dazzling white, turned slowly to a glowing gold. On either hand the fast-approaching night had changed the glories of the autumn tints to a sombre shade of violet, and behind us the river was a mere streak of light. The glow of the fire upon the other raft lit up the bearded faces of our Russian guides around it; and when the daylight had fairly waned, the head of Kluchefskaya stood out a pale greenish white—a spectral mountain against the fast-darkening sky. Come what might, even if we were never again to get a glimpse of them, we had seen the great volcanoes, and we felt that the sight was one that we should not easily forget for many years to come." (vol. i. p. 149).

After rejoining the yacht the party visited the well-known breeding-places of the fur seal at Bering Island; from thence back to Kamschatka, and then to Yokohama to refit and repair. A brief history of Russian discovery in these seas, and a record of a little-known defeat of the allied forces of England and France in 1854 at Avatcha, will also be found in this volume.

In Volume II. the scene changes from the snowy north to the tropics, where for a long time the *Marchesa* wandered from one island of the Indian Ocean to another. The little-known Island of Cagayan Sulu is described as perhaps the most beautiful of all tropical islands. A revised chart of the island is given; and its three crater-lakes, one of the most interesting phenomena to be met with in the Eastern seas, were visited and described. The third lake had escaped the notice not only of Admiral Keppel, who had twice visited this island, but also of Captain Chimmo, who had in 1871 surveyed Cagayan Sulu. This lake was of rather smaller size than the others, being two-



Brunei.

fifths instead of three-fifths of a mile in diameter; but the basin was perfectly circular, and filled with water to about the level of the second lake. Thick jungle clothed its precipitous sides, but the latter, instead of running sheer down into the water, left room for a small beach on which wild bananas were growing.

The islands of the Sulu Archipelago are described in Chapters II. to IV. of this volume. Natural history rambles were made over Sulu; and the Sultan, with and without his wives, visited the yacht. Some days were spent with the Spaniards at Jolo, a fortress on the northern side of the island. The fauna and flora of the Philippines and Borneo are contrasted with those of Sulu, and the Sulu Archipelago is determined to be, zoographically, purely Philippine, the Sibutu Passage forming the boundary line.

The newly-acquired territories of the British North Borneo Company were next visited, and some details are given of the existing state of things in this new colony. The colony at Labuan was found to be retrogressing. The

Sultan was interviewed; and Brunei, the Venice of the East, in which, except its market, there is little of interest, was explored. The great dexterity of the boatmen in the use of their paddles is noted. "From a rapid and beautifully clean stroke of forty or more to the minute, they would drop instantaneously to a long steady swing of twenty, without any apparent signal having been given, and without a hair's-breadth of deviation from the perfect time."

We pass over the chapter on Sumbawa, and next find the yacht at Celebes. Macassar is the Hong Kong of the Dutch, and is not attractive from the sea.

"The town is much as other Dutch Malayan towns. A row of white shops and merchants' offices lines the sea; and dust of a lightness and powderiness that is not excelled even in California or the Diamond Fields covers the streets to the depth of an inch or more. These are otherwise clean enough, and the spare time of the native servants, and they appear to have plenty of it, is occupied

in perpetual watering. There is of course a fort, and equally of course a 'plein.' The cemetery is significantly full. Almost all the tombs are kept whitewashed, and as many of them are curious chapel-like erections with flying buttresses, the effect at a distance is something between an ice palace and a clothes-drying ground. The houses of the Dutch residents, shadowed in peepul or galela trees, stand back a little distance from the road, long, low, and cool, with thick white posts at their entrance gates. A long avenue of magnificent overarching trees leads eastwards from the pier, adown which the Governor may be seen driving any afternoon in a four-in-hand, with sky-blue reins. It is lighted by means of lamps hung midway between the trees, for the Hollander, even although gas may be unattainable, considers civilisation incomplete without these adjuncts. Then too there is the club, with its zinc-topped tables set out *café*-fashion beneath the trees. It is called the 'Harmonie,' as is every Dutch club in Malaysia, and within all is dark and deserted and cool during the mid-day heat. The servants are curled up asleep behind the bar or in the corners of the rooms, and would stare in dumb astonishment at the apparition of a European; for the early business of the day over, and the *rijst tafel*, or lunch, despatched, the white residents get into their *pyjamas* and take a siesta till three or four o'clock. A couple of hours or so are then devoted to business, and towards sunset the male portion of the population meet at the 'Harmonie' to chat and drink *pijtjes*. Billiards is the most violent exercise taken; cricket, bowls, and lawn-tennis are unknown" (vol. ii. p. 156).

Among the pleasant reminiscences of the travellers about their travels in the north of Celebes will doubtless be those of their visits to the Tondano Lake with its pretty waterfall; to Talisse Island, where at "Wallace Bay" the habits of the maleo (*Megacephalon maleo*) were observed, and a good store of their eggs and bodies were collected; and to Kema, where a great babiroussa hunt was held.

The name Moluccas, at one time restricted to the little chain of volcanic islets lying off the western coast of Gilolo, of which Ternate is the chief, now includes all the islands between Celebes and the Papuan group. As regards magnificence of scenery, Ternate is perhaps the finest harbour in the Dutch Indies. The Resident, Mr. Morris, kept a large aviary of rare birds, amongst which the gems were two superb specimens—both full-plumaged males—of the twelve-wired bird of paradise. These exquisite creatures were fed on the fruit of the pandanus, with an occasional cockroach as a *bonne bouche*. "The feelings of admiration with which I watched these birds, which are among the most beautiful of all living beings, I need not," says the writer, "attempt to describe." The concluding chapters of this volume bring us to New Guinea, the very home of paradise birds. The portion of this great island visited was the western half, that claimed by the Dutch; which, from the variation in species from island to island, and the peculiarity of these birds of paradise, is perhaps the most interesting to a naturalist. A safe anchorage was secured at the extreme east end of the Island of Batanta, in "Marchesa Bay." The first ramble on shore was unsuccessful. Scrambling over the mangroves' slimy roots, and struggling up to their knees in liquid ooze, they found that the land was hard to reach; the shore rose steeply from the sea; and the dripping wet jungle made progress all the more difficult. The party returned disappointed to the yacht, to find that some of the hunters were already back, equally empty-handed. Presently, however, "Usman and his *compagnon de chasse* appeared triumphant, carefully carrying a prize that we had hoped, but hardly expected, to obtain—the curious and exquisitely lovely little *Diphylodes wilsoni*, smallest of all the birds of paradise. Behind the head, a ruff of canary-coloured feathers stands

erect above the scarlet back and wings. The breast is covered by a shield of glossy green plumes, which towards the throat are marked with metallic green, and violet spots of extraordinary brilliancy. The two centre feathers of the tail, prolonged for five or six inches beyond the others, cross one another, and are curved into a complete circle of bright steely purple. But the chief peculiarity of the bird is the head, which is bald from the vertex backwards, the bare skin being of the brightest imaginable cobalt blue (the figure in Gould's 'Birds of New Guinea' gives no notion of the extreme brilliancy of the colouring of this part). The *bizarre* effect thus produced is still further heightened by two fine lines of feathers which, running lengthways and from side to side, form a dark cross upon the brilliant azure background. I could hardly make up my mind to skin this little ornithological rainbow, whose exquisite plumage it seemed almost a sacrilege to disarrange, but the climate of New Guinea allows of but little delay in this operation, and I set about my task at once. The bird had been scarcely injured by the shot, and I succeeded in making a perfect skin of it" (vol. ii. p. 254).

Dorei Bay, well known as the settlement of the Dutch missionaries, and the residence of Mr. Wallace in 1858, was the next station. Some few miles south of Dorei Bay is Andai, a small village nestling at the foot of the Arfak Mountains. The dense forests that clothe these mountains are the favoured haunts of such magnificent paradise birds as the great velvet-black *Epimachus*, with its tail a yard in length; the *Astrapia*, in its uniform of dark violet, faced with golden-green and copper; and the orange-coloured *Xanthomelus*. There D'Alberty had shot his *Drepanornis*, with its two fan-like tufts, one flame-cloured, the other tipped with metallic violet; and there Beccari braved the climate and made such splendid collections. The summits of the mountains were less than ten miles from where the yacht was, and yet this land of promise could not be entered. Our readers must seek the reason why in the narrative: here we can only add that the homeward voyage had begun.

In so short a sketch it is simply impossible to do more than give the reader an idea of what he may expect to find within the pages of these volumes. Students of geography, ethnology, and, above all, zoology, will discover therein a great deal that is of interest, and also much that is novel; and every reader will be pleased by the writer's freshness of style and keen enjoyment of Nature. To enjoy travelling, especially in the tropics, one must be of an equable, not to say of a cheerful, frame of mind. We close the perusal of Dr. Guillemand's delightful volumes with the impression that the company on board the yacht *Marchesa* was certainly of this kind.

In several appendixes to Volume II. there are lists of the birds met with in the various regions visited, and of the shells. There is also a list of the *Rhopalocera* collected in the Eastern Archipelago, and of the languages of Sulu, of Waigiou, and of Jobi Island. Tables are given of the total export in 1884 of the chief articles of produce in the Netherlands India, North and South Celebes, Amboyna, and Ternate.

THE SMITHSONIAN INSTITUTION

THE annual Report of Prof. Baird, Secretary of the Smithsonian Institution, has just been issued. It relates to the period from July 1, 1885, to the close of June 1886, and includes, in addition to the account of the operations of the Institution itself, a summary of the work done by the branches of the public service placed by Congress under its charge, namely, the National Museum and the Bureau of Ethnology. To this is added a sketch of the work of the U.S. Fish Commission, which is also under Prof. Baird's charge, and of that of the U.S. Geological Survey, which, although independent of the Smithsonian Institution, is in close relation with it by