

of additional workmen employed in charging the retorts, interest upon additional capital required for transit appliances, and the terms to be made with the gas companies for carrying out the scheme.¹

I cannot close without acknowledging the help I have received from Mr. Wallace, the gas manager at Woolwich Arsenal, and the valuable information obtained from Mr. Field's tabulated accounts of the London gas companies. So far as I am aware my contributions to the *Builder* and elsewhere are the only writing on the subject of my scheme that has ever been made public.

W. D. SCOTT MONCRIEFF

Westminster, December 13

NEW GUINEA²

OF the few travellers who have attempted to explore the great island of New Guinea, Signor D'Albertis must undoubtedly be considered the chief, since he alone

has made extensive and repeated journeys both in the north-western and the south-eastern parts of the island, and has thus been able to examine and compare some of the most distinct tribes or races which inhabit the country. The narrative of his travels has therefore been looked for with some interest, for though several of his journeys have been more or less fully described in newspapers and magazines, it was felt that much must remain to be told, and that so energetic a traveller would probably be able to throw some fuller light on the hitherto doubtful affinities and relations of the Papuan races.

Leaving Genoa in November, 1871, in company with the well-known traveller and botanist Dr. Beccari, and making short excursions in Java and the Moluccas, our travellers hired a small schooner at Amboyna in March, 1872, to take them to Outanata, on the south coast of New Guinea; and after some delays at Goram seeking a pilot and interpreter, on April 9 D'Albertis records in his journal: "A memorable day! At last I tread the mys-

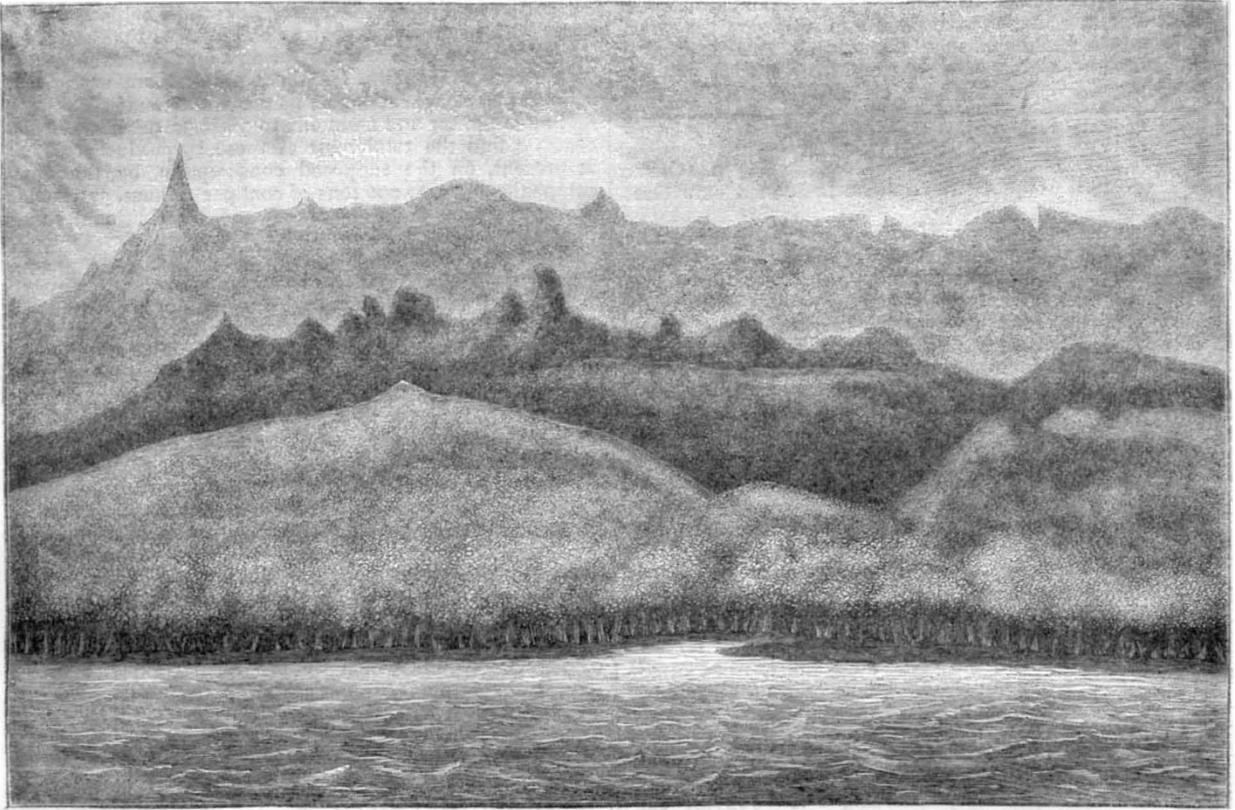


FIG. 1.—Mount Yule Range, seen from Yule Island.

terious land. At last, leaping on shore this morning, I exclaimed, 'We are in New Guinea!'

Finding no safe or convenient place to stay at on the south coast, they proceeded to Salwati and fixed their abode for some time at Sorong, a small island close to the north-western extremity of the main land of Papua. From this point they made excursions into the interior, and D'Albertis resided some time at the inland village of Ramoi, where he was near dying of dropsy and fever. They then went in a native vessel to Dorey Harbour, where they arrived in August, and sttled themselves at Andai Village,

¹ By experiment I find that the greater heating power of the fuel in excess of the coke more than makes up for the cooling which takes place on account of the more frequent charging of the retorts.

² "New Guinea: What I Did and What I Saw." By L. M. D'Albertis, Officer of the Order of the Crown of Italy, &c., &c. In two volumes. (London: Sampson Low, Marston, Searle and Rivington, 188c.)

where a German missionary resides. Here they had a house built, which was their headquarters till November, and D'Albertis succeeded in spending some weeks at Hatam, a village on Mount Arfak, about 3500 feet above the sea, and in the midst of the forests inhabited by the finest and rarest of the birds of paradise. On the very day after his arrival here he shot both the shielded and the six-shafted paradise-birds (*Lophorina atra* and *Parotia sexpennis*), two species which had certainly never before been seen alive or freshly killed by any European; and before he left this spot he obtained many other rare species, besides an altogether new and beautiful kind, which has been named *Drepanornis albertisii*.

Constant attacks of fever and dropsy, however, reduced him to such a state of weakness that it was absolutely necessary to seek a change of climate, and returning to

Amboyna he was taken by an Italian man-of-war to Sydney, making some stay at the Aru Islands and South-Eastern New Guinea on the way. Thence he went home by way of the Sandwich Islands, San Francisco, and New York, reaching Europe in April, 1874, and thus terminating his first voyage to the far east.

When leaving Dorey in the end of 1872 he had determined to return to the north coast and to penetrate further into its forest-clad mountains, but the subsequent journeys of Dr. Mayer, of which he heard at Sydney, and Dr. Beccari's intention to return to the same district, induced him to turn his attention to the south, where he had obtained from the natives the skin of a new bird of paradise, and where the lofty ranges of Mount Yule and Mount Stanley offered the prospect of an equally rich and still less known exploring ground. Accordingly, in December 1874, he reached Somerset (Cape York) by way of Singapore, with the intention of settling at Yule Island, which he had before fixed upon as convenient head-quarters for the exploration of Southern New Guinea. After some difficulty and delay he reached the island on March 17, and finding the natives friendly obtained permission to occupy some land and build a house. Here he stayed till November, having with him a young Italian, two Cingalese, and five Polynesians; making large collections of natural history, exploring the island and the shores of the mainland, but being quite unsuccessful in his attempts to reach even the foot of the great mountains of the interior.

This completes the first volume, which contains by far the most interesting matter both to the naturalist and to the general reader. The second volume is devoted to a detailed journal of three successive voyages up the Fly River, the first in the missionary steamer *Ellangowan*, the two others in a small steam-launch, the *Neva*, lent him by the Governor of New South Wales. On the second and most successful of these voyages D'Alberty penetrated to the very centre of the great southern mass of New Guinea, reaching the hilly country, but not the great central range of mountains, of which a few glimpses were obtained at a considerable distance.

The first impression produced by the careful perusal of these volumes is, that Signor D'Alberty has all the best qualities of an explorer—enthusiasm, boldness, and resource, a deep love of nature, great humanity, and an amount of sympathy with savages which enables him to read their motives and appreciate the good qualities which they possess. To the character of a scientific traveller he makes no claim, and those who expect to find any sound generalisations from the results of his observations will in all probability be disappointed. Let us, however, by a few examples and illustrative passages, enable our author to speak for himself.

While residing at the village of Ramoi he became prostrated by fever, and was besides almost starving, for the natives would sell him nothing neither would they carry his baggage to enable him to return to Sorong. Determining however not to die there without an effort, he sent for some of the chiefs to speak to him, and then grasping his loaded revolver assured them that unless they gave him men at once to assist him to leave the place not one of them should quit his hut alive. The plan succeeded. One was allowed to go and fetch the men, the others remaining as hostages, and the revolver never left his hand till his baggage was all on board the canoe. A little later when the travellers were on their way to Dorey, the native crew were very insolent, and boasted that when they reached their own country they would kill all the white men. D'Alberty, hearing this, asked the man if he dared to repeat it, and on his doing so suddenly seized him by the throat and pitched him overboard. He was, of course, on board again in a moment, and instantly seized a bamboo to attack our travellers, but they exhibited their revolvers, and so cowed

the whole crew that they became quiet and submissive for the rest of the voyage. An admirable portrait of one of these Dorey Papuans (Fanduri) is given, and the present writer can almost believe that he recognises in it one of his own acquaintances at Dorey in 1858.

More amusing was the way in which Signor D'Alberty made use of the aneroid on his journey to Hatam. His porters, who had agreed to take him there for a fixed payment, stopped at a village to rest; and on being told to go on, said, "This is Hatam; pay us our wages." He knew however, both by the distance and elevation, that that they were deceiving him, and told them so, but they again said, "This is Hatam; pay us. How do you know that this is not Hatam?" He then took his aneroid out of his pocket, and laying his finger on a point of the scale, said, "Here is Hatam; this thing tells me where it is;" and then explained that when they got higher up the mountain the index would move, and when they reached Hatam it would come to the point he had marked. This astonished them greatly, but they would not believe it without

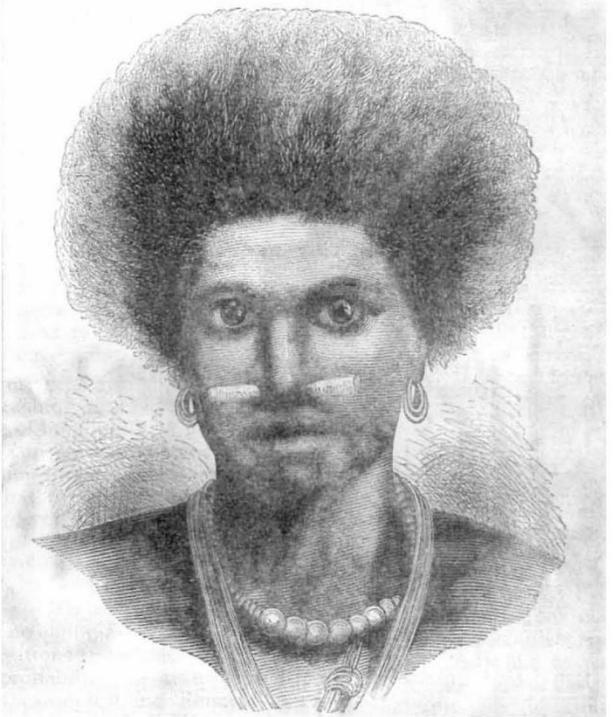


FIG. 2.—Fanduri, a Dorey Papuan

proof. So he let one of them carry it himself to the top of a small hill near, when they saw that the index had moved, and on coming down that it moved back again. This quite satisfied them. They acknowledged that the white man knew where he was going, and could not be deceived, so they at once said, "Let us rest to-day; to-morrow we will go to Hatam." Of course every man and woman in the village wanted to see the little thing that told the stranger where lay the most remote villages of the forest; and thus the traveller's influence was increased, and perhaps his personal safety secured.

In his second journey he provided himself with dynamite and rockets, which were very effectual in frightening the savages and giving him moral power over them. At Yule Island he was on excellent terms with the natives, on whom he conferred many benefits. Yet during his absence on an exploration his house was entered and a large quantity of goods stolen. In recovering these and firmly establishing his power and influence he showed great ingenuity. Calling the chiefs and other natives

together—who all pretended great regret at his loss, though the robbery must have been effected with their connivance—he told them that he was determined to have his property back, and that if it was not brought in twenty-four hours he would fire at every native who came within range of his house, which fortunately commanded a great extent of native paths, as well as the narrow strait between the island and the main land. He then made his preparations for a desperate defence in case he was attacked, loaded some Orsini shells and mined the paths leading to his house, so that with a long match he could blow them up without exposing himself. At the end of the twenty-four hours, nothing having been brought, he commenced operations by exploding five dynamite cartridges, which made a roar like that of a cannonade, the echoes resounding for several seconds. He then let off rockets in the direction of the native houses, and illumin-

ated his own house with Bengal fire. All this caused terrible consternation; and the next morning the chief arrived with five men, bringing a considerable portion of the stolen goods, and trembling with fear to such an extent that some of them could not articulate a word. He insisted however that the rest of the goods should be brought back; and the next day, to show that he was in earnest, fired at the chief himself, as he was passing at a distance of 300 yards, being careful not to hurt, but only to frighten him. A canoe was also turned back by a bullet striking a rock close by it. The effect of this was seen next morning in another visit from the chief, with five complete suits of clothes, axes, knives, beads, and other stolen articles. Much more, however, remained, and D'Albertis took the opportunity of impressing them thoroughly with his power. He first asked them to try to pierce a strong piece of zinc with their spears, which were

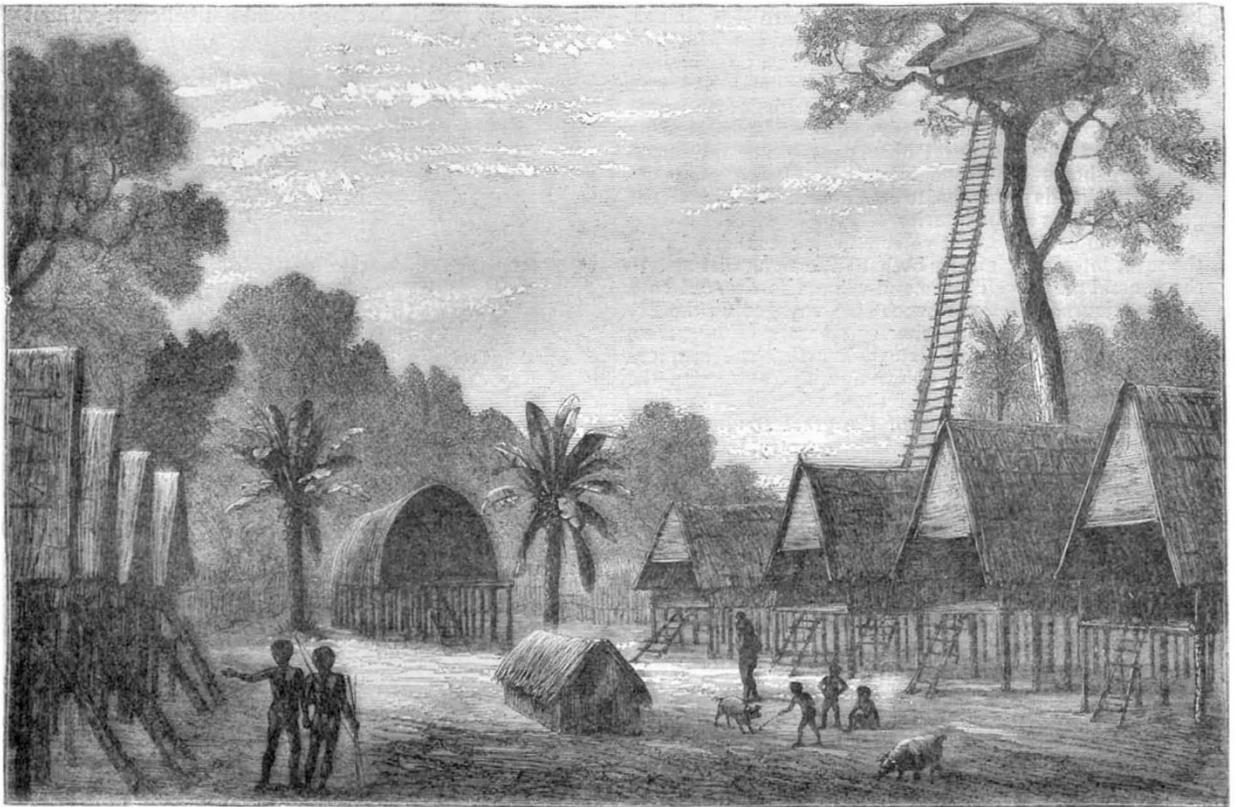


FIG. 3.—Epa, a Village of the Mahori-papuans.

blunted by the attempt, while he riddled it through and through with shot from his gun. He also sent bullets into the trunk of a small tree a hundred yards distant, showing that a man could not escape him. They had been seated on a large stone near his house, which he had mined. He now called them away, and having secretly lighted the match, told them to look at the stone. A tremendous explosion soon came, and the stone disappeared. The natives were too frightened to move, and begged him to have pity on them, promising to restore everything. A great hole was seen where the stone had stood, while some of its fragments were found a long way off. For twelve days more he kept up a state of siege, turning back all travellers and many canoes by rifle-balls in front of them, but never hurting any one. Then another large instalment of his goods was brought, leaving little of importance, and ultimately he recovered almost everything. During the

whole of this time he never hurt a single person or did any damage to their property, but succeeded in getting back his own by impressing them with his, to them, superhuman power. The result was that after eight months' residence he parted from these people on the best of terms. They all embraced him, and most of them shed tears, while their last words were: "*Maria rau! Maria rau!*" "Return, Maria! Return, Maria!"—that being his second name, by which they had found it most easy to call him.

As a fearless capturer of snakes Signor D'Albertis rivals, if he does not surpass, the celebrated Waterton; indeed he seems to like them rather than otherwise. At Yule Island the natives had found a large snake under a tree, and all ran away from it, crying out, and this is his account of what happened:—

"At last I went to the natives and tried to ascertain

the cause of their conduct, and they made me understand why they had fled. I then returned to see the snake myself, which in fact I did, although two-thirds of its length were hidden in a hole in the earth. His size was such that I concluded he could not be poisonous, and I at once grasped him by the tail. While dragging him out of his lair with my two hands I was prepared to flatten his neck close to his head with one foot the moment he emerged, so that he should not have the power of turning or moving. My plan succeeded perfectly, and while the snake's head was imprisoned under my foot I grasped his body with my hands, and, as though I had vanquished a terrible monster, turned towards the natives with an air of triumph. They, struck with terror, had looked on at the scene from a safe distance. I must confess that the snake offered little resistance, although it writhed and twisted itself round my arm, squeezing it so tightly as to stop the circulation, and make my hand black. I remained however in possession of its neck, and soon secured it firmly to a long thick stick I had brought with me. I then gave the reptile to my men to carry home." This serpent was thirteen feet long, whereas the one Waterton caught single-handed was but ten feet, though it might have been equally powerful. This snake was kept alive and became quite tame, and when the natives saw D'Alberty's kiss its head and let it coil round his legs they howled with amazement and admiration. Six weeks after the capture he writes:—"My snake continues to do well; it has twice cast its skin, is well-behaved and tame, and does not attempt to escape, even when I put it in the sun outside the house; and when I go to bring it in, it comes to me of its own accord. It never attempts to bite, even when I caress or tease it. While I am working I often hold it on my knees, where it remains for hours; sometimes it raises its head, and licks my face with its forked tongue. It is a true friend and companion to me. When the natives bother me it is useful in putting them to flight, for they are much afraid of it; it is quite sufficient for me to let my snake loose to make them fly at full speed." He kept this serpent for nearly six months, and latterly another of the same species with it, till at last both escaped, and he mourns their loss as of dear friends, adding, "for I loved them and they loved me, and we had passed a long time together."

The furthest village on the mainland visited by D'Alberty was Epa, where he lived five days, and of which he gives a very pleasing account. It is about 1500 feet above the sea, but a very short distance from the coast. The village is surrounded by a strong double stockade, and the people appear to be good specimens of the superior Mahori-Papuan race. By the aid of these people it would probably not have been difficult to penetrate to the mountains of the interior, but our traveller was drawn away by the opportunity of exploring the Fly River, and has left the exploration of this grand mountain range with its rich natural treasures for some future exploration or some other explorer. Having thus sketched the outline of Signor D'Alberty's eastern voyages and indicated his main characteristics as a traveller and an author, let us see what he has to tell us about the people among whom he travelled.

ALFRED R. WALLACE

(To be continued.)

PROF. J. C. WATSON.

WE regret to have to record the death of Prof. Watson, for many years director of the Observatory of Ann Arbor, Michigan, and later of the new Observatory established at Madison, Wisconsin, under the auspices of General Washburne.

James Craig Watson was born on January 28, 1838, in Elgin County, Canada West, of American parents who were residing in Canada at the time of his birth. While he was still a boy they removed to Ann Arbor, where at fifteen years of age he entered the University as a classical student, but his mathematical bias soon became evident. He studied astronomy under Prof. Brünnow, who was then in charge of the Ann Arbor Observatory, and Professor of Astronomy in the University, and while the latter was director of the Dudley Observatory at Albany, Watson occupied his place at Ann Arbor. In 1860, when Prof. Brünnow returned there, he was transferred to the Chair of Physics, which position he held until Prof. Brünnow finally severed his connection with Ann Arbor in 1863, when Watson was again appointed director of the Observatory. From this time his attention was chiefly directed to the discovery of minor planets, with which view he formed charts of very small stars; he had also in view the possible detection of an ultra-Neptunian planet, and it has been stated that latterly he had been more particularly working with this object, and had removed from Ann Arbor to Madison, to avail himself of the more powerful instrumental means at the latter place, where the refractor has an aperture of 16 inches, that of the Ann Arbor telescope being 12½. Watson added twenty-three members to the group of small planets, his first discovery being that of Eurynome in September, 1863.

In 1870 Watson proceeded to Sicily at the head of a Commission appointed by the United States Government to observe the total eclipse of the sun on December 22, and in 1874 he went to Pekin in charge of a similar Commission for the observation of the transit of Venus. While at Pekin he discovered No. 139 of the minor planet group, and it was stated at the time that the discovery was effected entirely through Watson's extraordinary recollection of the configuration of the small stars in the neighbourhood where the planet was situated (R.A. oh. 58m. 15s., Decl. + 10° 44'). A member of the Imperial family who had been asked to name the planet, called it the "Hope of China"; *Juewa*, the name by which it has since been known, being an Anglicisation of the Chinese term.

Watson's observations of two objects during the totality of the eclipse of July 29, 1878, which he considered to be intra-Mercurial planets, will be fresh in the recollection of the reader: there is no doubt that whatever opinion may have been entertained by other astronomers, he was himself convinced that he had met with planetary bodies, and he stoutly defended his opinion against the doubts raised in his own country.

Watson was the author of a valuable work upon Theoretical Astronomy, published in 1867, upon which his reputation as an author mainly depends. He was a member of the principal scientific institutions of the United States, and his merits were acknowledged by several of the European Academies; he received the Lalande Medal of the Paris Academy of Sciences in 1870 for his numerous planetary discoveries.

The death of Prof. Watson took place somewhat suddenly on the morning of November 23, at his residence on Observatory Hill, Madison, Wisconsin, and is attributed to intestinal inflammation, following upon a severe cold, in an overstrained condition of body: he had been working hard as usual at night, while superintending the completion of the Observatory buildings by day. He was buried at Ann Arbor on November 26; memorial services were held in the University hall, and were attended by a body of between seven and eight hundred students, and a large concourse of the general public, addresses being delivered by the President and several Professors of the University, of which the Ann Arbor and Detroit journals furnish lengthy reports.