

ART. VI.—*On the Structure and Habits of the Huia (Heteralocha Gouldi).*
By WALTER BULLER, F.L.S., F.G.S.

(With Illustrations.)

[Read before the Wellington Philosophical Society, November 12, 1870.]

AN article in *Nature* (June 23) bearing the initials of a well-known naturalist, notices the arrival of a living example of the Huia (*Heteralocha Gouldi*) at the Zoological Society's Gardens, London. The specimen was a male bird, and the writer in describing the peculiarity in the form of the bill that distinguishes it from the female, observes,—“Such a divergence in the structure of the beak of the two sexes is very uncommon, and scarcely to be paralleled in the class of Birds. It is difficult to guess at the reason of it, or to explain it on Darwinian or any other principles.”

Although Dr. Hector, with his usual good fortune, has succeeded in getting a fine series of specimens for the Colonial Museum, this bird undoubtedly ranks as one of our rarest and most valuable species. Ere long it will exist only in our museums and other collections, and, for the sake of science, it is important that everything connected with its natural history should be faithfully recorded and preserved. In the absence of any published account of its habits, beyond mere fragmentary notices, I have thought the subject of sufficient interest to justify my placing before the Society the following complete account of all that I have been able to ascertain respecting it. The peculiar habits of feeding, which I have described from actual observation, furnish to my own mind a sufficient “reason” for the different development of the mandibles in the two sexes, and may, I think, be accepted as a satisfactory solution of the problem.

Before proceeding to speak of the bird itself, I would remark on the very restricted character of its habitat. It is confined within narrow geographical boundaries, being met with only in the Ruahine, Tararua, and Rimutaka mountain ranges, with their divergent spurs, and in the intervening wooded valleys. It is occasionally found in the *Fagus* forests of the Wairarapa Valley, and in the rugged country stretching to the westward of the Ruahine Range, but it seldom wanders far from its mountain haunts. I have been assured of its occurrence in the wooded country near Massacre Bay (Province of Nelson), but I have not been able to obtain any satisfactory evidence on this point. It is worthy of remark that the natives, who prize the bird very highly for its tail feathers (which are used as a badge of mourning), state that, unlike other species which have of late years diminished and become more confined in their range, the Huia was, from time immemorial, limited in its distribution to the district I have indicated.

My first specimen of this singular bird (an adult female) was obtained in

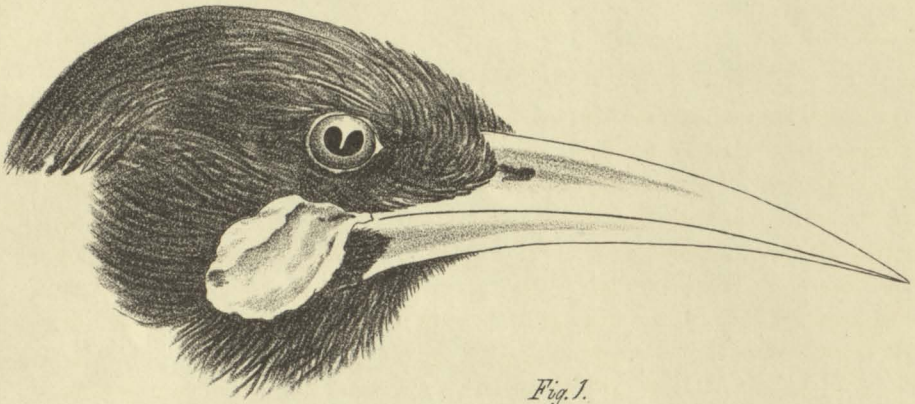


Fig. 1.

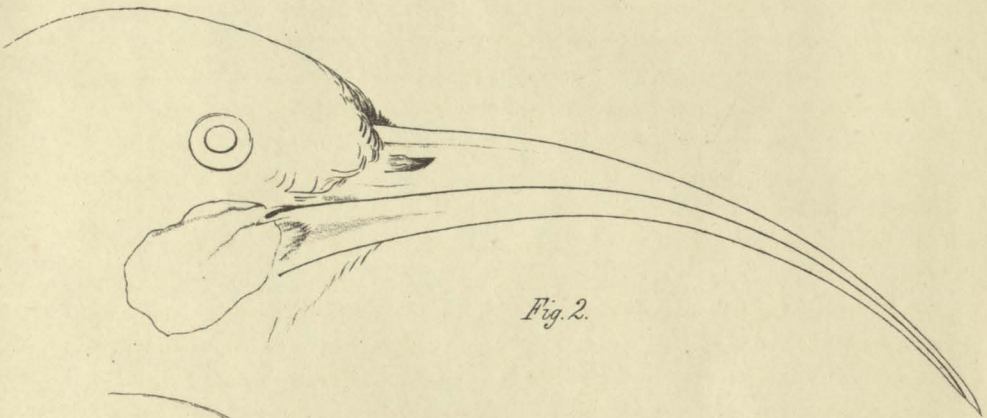


Fig. 2.

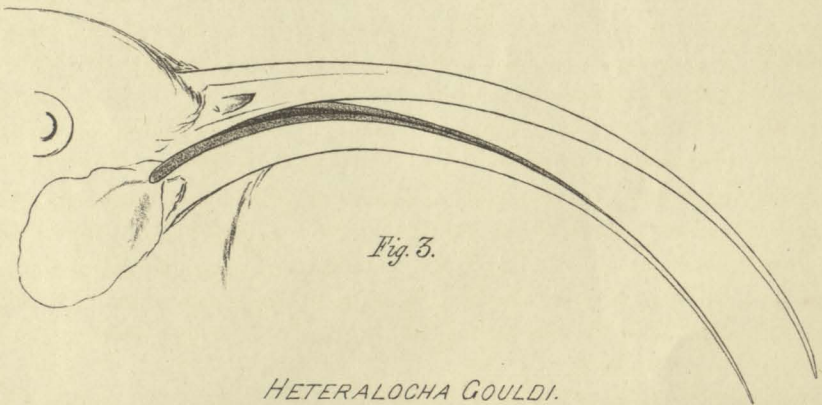
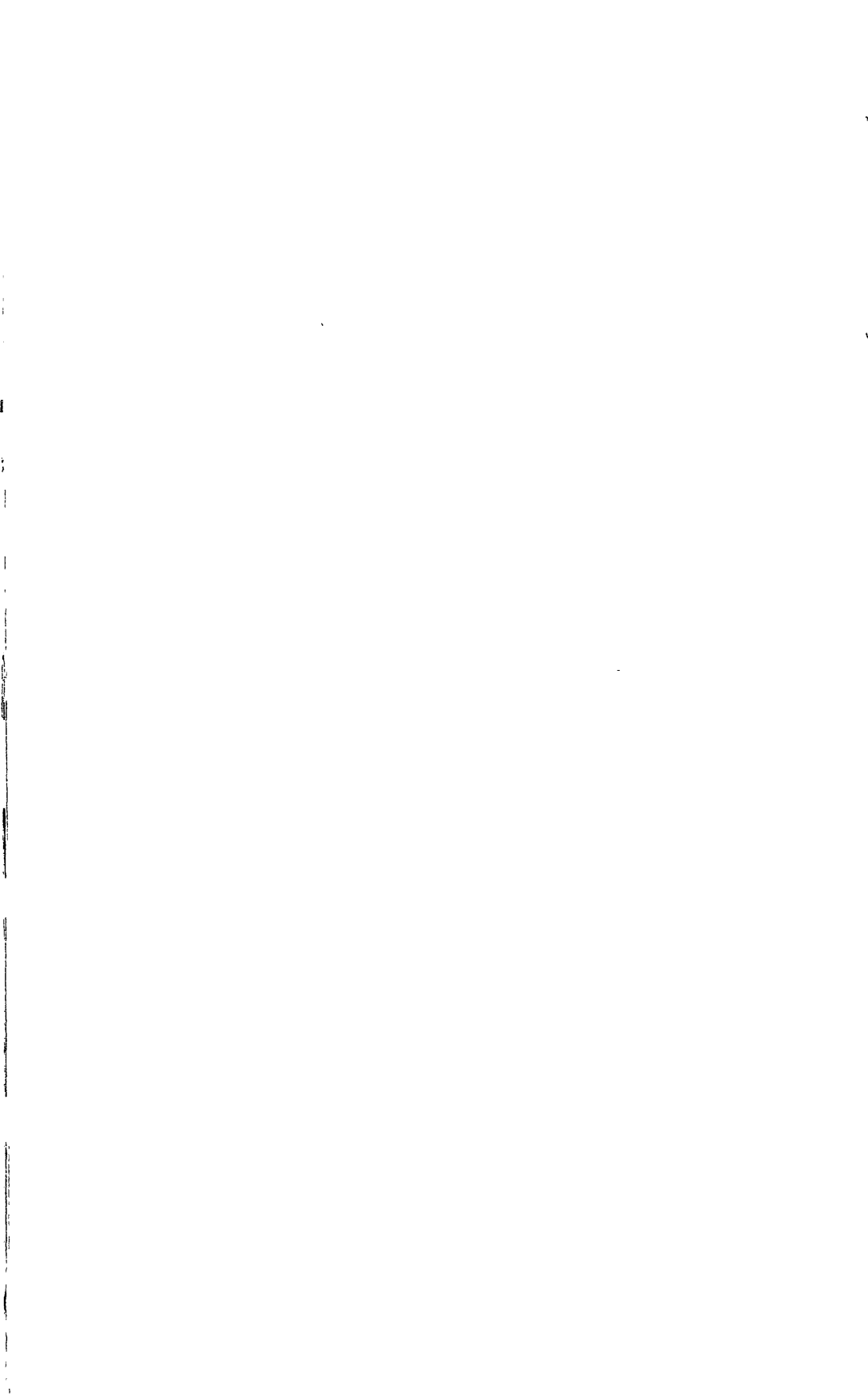


Fig. 3.

HETERALOCHA GOULDI.

Fig. 1. Male.

Fig. 2 & 3. Female.



1855, from the Wainuiomata Hills, a continuation of the Rimutaka Range, bounding the Wellington Harbour on the northern side,—the same locality from which Dr. Dieffenbach, nearly twenty years before, received the examples figured by Mr. Gould in his magnificent work on the Birds of Australia. I have since obtained many fine specimens, and in the summer of 1864, I succeeded in getting a pair of live ones. They were caught by a native in the ranges, and brought down to Manawatu, a distance of more than fifty miles, on horseback. The owner refused to take money for them, but I negotiated an exchange for a valuable greenstone. I kept these birds for more than a year, waiting a favourable opportunity of forwarding them to the Zoological Society of London. Through the carelessness, however, of a servant, the male bird was accidentally killed, and the other manifesting the utmost distress, pined for her mate and died ten days afterwards.

The readiness with which these birds adapted themselves to a condition of captivity was very remarkable. Within a few days after their capture they had become perfectly tame, and did not appear to feel in any degree the restraint of confinement, for, although the window of the apartment in which they were kept was thrown open and replaced by thin wire netting, I never saw them make any attempt to regain their liberty. It is well known, however, that birds of different species differ widely in natural disposition and temper. The captive eagle frets in his sulky pride, the bittern refuses food and dies untamable, the fluttering little humming bird beats itself to death against the tiny bars of its prison in its futile efforts to escape, and many species that appear to submit readily to their changed condition of life, ultimately pine, sicken, and die. There are other species again which cheerfully adapt themselves to their new life, although caged at maturity, and seem to thrive fully as well under confinement as in a state of nature. Parrots, for example, are easily tamed, and I have met with numerous instances of their voluntary return after having regained their liberty. This tamability of character was exemplified to perfection in the *Huias*.

They were fully adult birds, and were caught in the following simple manner. Attracting the birds by an imitation of their cry to the place where he lay concealed, the native, with the aid of a long rod, slipped a running knot over the head of the female and secured her. The male, emboldened by the loss of his mate, suffered himself to be easily caught in the same manner. On receiving these birds I set them free in a well-lined and properly ventilated room, measuring about six feet by eight feet. They appeared to be stiff after their severe jolt on horseback, and after feeding freely on the huhu grub, a pot of which the native had brought with them, they retired to one of the perches I had set up for them, and cuddled together for the night.

In the morning I found them somewhat recruited, feeding with avidity, sipping water from a dish, and flitting about in a very active manner. It was

amusing to note their treatment of the huhu. This grub, the larva of a large nocturnal beetle (*Prionoplus reticularis*), which constitutes their principal food, infests all decayed timber, attaining at maturity the size of a man's little finger. Like all grubs of its kind, it is furnished with a hard head and horny mandibles. On offering one of these to the Huia, he would seize it in the middle and, at once transferring it to his perch and placing one foot firmly upon it, he would tear off the hard parts, then throwing the grub upwards to secure it lengthwise in his bill, would swallow it whole. For the first few days these birds were comparatively quiet, remaining stationary on their perch as soon as their hunger was appeased. But they afterwards became more lively and active, indulging in play with each other and seldom remaining more than a few moments in one position. I sent to the woods for a small branched tree, and placed it in the centre of the room, the floor of which was spread with sand and gravel. It was most interesting to watch these graceful birds hopping from branch to branch, occasionally spreading the tail into a broad fan, displaying themselves in a variety of natural attitudes and then meeting to caress each other with their ivory bills, uttering at the same time a low affectionate twitter. They generally moved along the branches by a succession of light hops after the manner of the kokako (*Callæas cinerea*), and they often descended to the floor where their mode of progression was the same. They seemed never to tire of probing and chiselling with their beaks. Having discovered that the canvas lining of the room was pervious, they were incessantly piercing it, and tearing off large strips of paper till, in the course of a few days, the walls were completely defaced.

But what interested me most of all was the manner in which the birds assisted each other in their search for food, because it appeared to explain the use, in the economy of nature, of the differently formed bills in the two sexes. To divert the birds I introduced a log of decayed wood infested with the huhu grub. They at once attacked it, carefully probing the softer parts with their bills, and then vigorously assailing them, scooping out the decayed wood till the larva or pupa was visible, when it was carefully drawn from its cell, treated in the way described above, and then swallowed. The very different development of the mandibles in the two sexes enabled them to perform separate offices. The male always attacked the more decayed portions of the wood, chiselling out his prey after the manner of some wood-peckers, while the female probed with her long pliant bill the other cells, where the hardness of the surrounding parts resisted the chisel of her mate. Sometimes I observed the male remove the decayed portion without being able to reach the grub, when the female would at once come to his aid, and accomplish with her long slender bill what he had failed to do. I noticed, however, that the female always appropriated to her own use the morsels thus obtained.

For some days they refused to eat anything but huhu, but by degrees they

yielded to a change of food, and at length would eat cooked potato and raw meat minced up in small pieces. They were kept supplied with a dish of fresh water, but seldom washed themselves although often repairing to the vessel to drink. Their ordinary call was a soft and clear whistle, at first prolonged, then short and quickly repeated, both birds joining in it. When excited or hungry they raised their whistling note to a high pitch; at other times it was softly modulated, with variations, or changed into a low chuckling note. Sometimes their cry resembled the whining of young puppies so exactly as almost to defy detection.

Dr. Dieffenbach, in forwarding his specimens of the Huia to Mr. Gould, in 1836, wrote,—“These fine birds can only be obtained with the help of a native, who calls them with a shrill and long continued whistle resembling the sound of the native name of the species. After an extensive journey in the hilly forest in search of them, I had at last the pleasure of seeing four alight on the lower branches of the trees near which the native accompanying me stood. They came quick as lightning, descending from branch to branch, spreading out the tail and throwing up the wings.” I have had only a single opportunity of observing this species in its native haunts, and I was struck by the same peculiarities in its manners and general demeanour. In the summer of 1867, accompanied by a friend and two natives, I made an expedition into the Ruahine Ranges in search of novelties. After a tramp on foot of nearly twenty miles, through a densely wooded country, we were rewarded by finding the Huia. We were climbing the side of a steep acclivity, and had halted to dig specimens of the curious vegetating caterpillar (*Sphaeria Robertsi*), which was abundant there. While thus engaged, we heard the soft flute note of the Huia in the wooded gully far beneath us. One of our native companions at once imitated the call, and in a few seconds a pair of beautiful Huias, male and female, appeared in the branches near us. They remained gazing at us only a few instants, and then started off up the side of the hill, moving by a succession of hops, often along the ground, the male generally leading. Waiting till he could get both birds in a line, my friend at length pulled trigger, but the cap snapped and the Huias instantly disappeared down the wooded ravine. Then followed a chevy of some three miles, down the mountain side and up its rugged ravines. Once more, owing to the dampness of the weather, the cap snapped and the birds were finally lost sight of. I observed that their mode of progression was similar to that of the kokako, but far more rapid. While in motion they kept near each other and uttered constantly a soft twitter. The tail was often partially spread, while the bright orange lappets were usually compressed under the rami of the lower jaw.

We camped that night near the bed of a mountain rivulet, in a deep wooded ravine, and soon after dawn we again heard the rich notes of a Huia.

Failing to allure him by an imitation of the call, although he frequently answered it, we crossed to the other side of the gully, and climbed the hill to a clump of tall rimu trees (*Dacrydium cupressinum*), where we found him. He was perched on the high limb of a rimu, chiselling it with his powerful beak, and tearing off large pieces of bark, doubtless in search of insects, and it was the falling of these fragments that guided us to the spot, and enabled us to find him. This solitary bird, which proved to be an old male, had frequented this neighbourhood, as we were informed by the natives, for several years, his notes being familiar to the people who passed to and fro along the Otairi track, leading to Taupo. On asking a native how the Huia contrived to extract the huhu from the decayed timber, he replied, "by digging with his pick-axe"—an expression which I found to be truthfully descriptive of the operation; and on dissecting this specimen I found an extraordinary development of the requisite muscles. The skin was very tough, indicating probably extreme age. The stomach contained numerous remains of coleopterous insects, of the kind usually found under the bark of trees, also one or two caterpillars. In the stomach of another, I once discovered seeds of the hinau (*Elaeocarpus dentatus*) and the remains of a small earth grub. Dr. Dieffenbach states that in the stomachs of his specimens he found hinau berries, together with dipterous and coleopterous insects.

Of the nidification of the Huia nothing is at present known. I have been assured, however, by a native, that he once found the nest of this bird in the cavity of a tree, that it contained two young birds, a male and a female, and that they differed from the adults in having the wattles flesh-white instead of orange.

Mr. Gould, who was the first to characterize the genus (*Proc. Zool. Soc.*, Part iv., p. 144), was deceived by the great difference in the form of the bill, and treated the sexes as distinct species, naming them respectively *Neomorpha crassirostris* and *N. acutirostris*,—a very natural mistake, "many genera even," as Mr. Gould observes, "having been founded upon more trivial differences of character." Mr. G. R. Gray having determined their identity, proposed to substitute the specific name of *Neomorpha Gouldi*, in compliment to the original describer. The generic term has since been changed to *Heteralocha*, and the Huia continues to be the sole representative of this anomalous genus.

The head of the female as figured in *Nature* (confessedly only a copy), is quite out of all natural proportion to that of the male, and is apt to give a false idea of its relative size and thickness.

In the generality of specimens, and in the published drawings that have hitherto appeared, the bill is of a yellowish horn colour, but this instead of being natural is caused by the decomposition of the animal matter inside. I have succeeded in retaining the ivory whiteness of the bill, in preserved specimens, by treating them after the manner recommended by Waterton for

preserving the bill of the American toucan (see *Wanderings*, p. 103), that is to say, by removing with a sharp scalpel the whole of the inner substance, leaving nothing but the outer shell, which then retains its original appearance. The process is a tedious one, but the result amply repays the trouble.

The sexes are alike in plumage, and differ very slightly in size. The whole of the plumage is black, with a green metallic gloss; the tail with a broad terminal band of white. Bill ivory white, darkening to bluish grey at the base. Wattles large, rounded, and of a rich orange colour in the living birds. Legs and feet bluish grey; claws light horn colour.

In some examples the white at the end of the tail is tinged more or less with rufous, while in others the under tail coverts also are tipped with white.

Male.—Length $18\frac{3}{4}$ inches; extent of wings $22\frac{1}{2}$; wing from flexure 8; tail $7\frac{1}{2}$; bill along the ridge $2\frac{3}{4}$, along the edge of lower mandible $2\frac{3}{4}$; tarsus 3; middle toe and claw $2\frac{1}{2}$; hind toe and claw 2.

Female.—Length $19\frac{1}{2}$ inches; extent of wings 21; wing from flexure $7\frac{1}{2}$; tail $7\frac{1}{4}$; bill along the ridge 4, along the edge of lower mandible $4\frac{1}{8}$; tarsus 3; middle toe and claw $2\frac{1}{4}$; hind toe and claw $1\frac{3}{4}$.

Figures 1 and 2 (Plate IV.) represent the heads of the male and female which I had in my possession alive, and will give an accurate idea of the divergence of sexual character treated of above. Figure 3 represents a more highly curved form of the bill than is usually met with, and is taken from the dried head of a *Huia* given to me, many years ago, by a native who was wearing it as an ear ornament.

ART. VII.—*On the Katipo, or Venomous Spider of New Zealand.*

By WALTER BULLER, F.L.S., F.G.S.

[Read before the Wellington Philosophical Society, November 12, 1870.]

So little appears to be known of the natural history of the Katipo, or Venomous Spider of New Zealand, that I have deemed the following observations on its range and habits of sufficient interest to warrant my placing them before the Society.

The first scientific notice, so far as I am aware, of the existence of a poisonous spider in this country, was furnished by Dr. Ralph, formerly of Wellington, in a communication to the Linnean Society, in 1856. (See *Journal, Proc. Lin. Soc.*, Vol. i., Zool., 1856, p. 1-2.) Dr. Ralph's paper contained a short description of the full-grown spider, observations on its nesting habits, and an account of experiments which he had made in order to test the potency of its venom.

The native name, *Katipo*, signifies "night-stinger," (being derived from