MEMOIR
ON THE
INTEGUMENT AND PLUMAGE OF DINORNIS.

ALTHOUGH reports, more or less sensational, of the view and even capture of a living gigantic Moa have obtained, from time to time, newspaper circulation, no specimen, dead or alive, has yet reached Europe, or come into the hands or purview of any competent scientific observer in New Zealand. No stuffed Dinornis, alongside the Notornis, enriches the ornithological gallery of the national collection of natural history. Yet, in 1848, such an acquisition would have been as unlooked for and as unlikely as that of the large and seemingly extinct Coot of New Zealand.

A faint gleam of hope of a possibility of such coming event passed across my mind when, in 1864, I received from the accomplished State Geologist of the Province of Wellington, James Hector, M.D., F.R.S., &c., the announcement of the discovery of an almost entire skeleton of a large-sized Moa, in which “portions of the integument and feathers still remain attached to the sacrum”\(^1\). A portion of the skin was attached also to the sole of one foot of this specimen\(^2\). The skeleton in question, determined to belong to the species *Dinornis robustus*, was forwarded, as above stated, to the Museum of the Philosophical Society of York, and the experienced Keeper of that Museum communicated the results of his examination of the remains of the feathers to the Zoological Society of London\(^3\).

The dried skin, with portions of feathers, was attached to the upper rhombic area of the pelvis (shown at c, c, fig. 3, Plate XX.), and extended, on the left side, beyond the ridge there bounding the area, down to a part where, beneath the skin, was attached the aponeurotic portion of a femoral muscle. The feather-bearing part of the skin forms a broad irregular transverse band, and, posteriorly, a little to the right of the centre, were many perforations in the rather thick and coarse skin, indicative of feathers that had disappeared. The remains of these, in places, were limited to the skin on the flat area, in which their insertions give rise to strongly marked papillae.

\(^1\) Ante, p. 154.
\(^2\) The subject of the Memoir, p. 248, plate lxxi.
shaft, with here and there some traces of barbs. The longest portion of shaft so preserved did not exceed 2 inches; the quill was about \( \frac{1}{2} \) of an inch in diameter. In the dried skin it was inserted \( \frac{3}{8} \) of an inch, and the webs appear generally to have commenced about \( \frac{1}{4} \) of an inch from the junction of the quill with the shaft.

The longest accessory shaft measured 1½ inch in length, but, like the main shaft, was imperfect; it is more slender, and was doubtless shorter than the main shaft. This is slightly convex above, and shows the usual fine longitudinal furrow beneath. Here it is of a brown colour, but of a pale horn-colour above, probably," as Mr. Dallas remarks, "from exposure to external influences. The accessory shaft is of a pale horn-colour, and appears to be nearly cylindrical."

In Plate CXIV, fig. 8 shows the basal portion of one of the feathers detached from the skin, \( a \) being that of the main, and \( b \) of the accessory shaft; fig. 9 shows another basal portion with a smaller accessory shaft, \( b \); fig. 10 shows part of a barb with the barbules, magnified 15 diameters. These figures are from Mr. Dallas's memoir.

"The barbs consist of slender flattened fibres, bearing long silky and very delicate barbules, without any trace of barbicels. When magnified, the barbule appears to be divided by faint transverse partitions into a series of cells, some of which, towards the apex, exhibit small tooth-like projections representing the rudiments of barbicels."

From his careful and patient examination of these relics of plumage, Mr. Dallas established the fact that the feathers of *Dinornis robustus* possessed a large accessory plume, like "the green-egged Emus and Cassowaries existing in the Australian region," and differed thereby "from the white-egged group of Struthiones represented in Africa and South America" (op. cit.).

Confirmation of this conclusion, in regard to probably another species of *Dinornis*, has since been obtained. In 1871 I was favoured by receiving from my valued correspondent, Capt. F. W. Hutton, F.L.S., the following letter:

"Colonial Museum,
Wellington, N. Z., Sept. 1, 1871.

"Sir,

"Hearing that you have in preparation a work on the Moa, I think that an account of some feathers that I lately saw in the Otago Museum may be of interest to you.

"These feathers are stated to have been found by Mr. S. Thomson at the junction of the Manuhirikia with the Molyneux river, together with Moa-bones, under fifty feet of sand. Unfortunately none of the bones were preserved, so that it is not possible to say to what species they ought to be referred.

"The feathers are quite fresh in appearance, and have lost none of their colouring. They are four in number, and unfortunately all are broken.

"In one only is the tube preserved, showing the double plumes. The other three are all broken off above the tube, and differ from one another only in size. The largest
is 7 inches in length, and gradually widens from $\frac{1}{4}$ inch at the base to rather more than $\frac{3}{4}$ inch at the tip, where it is broadly rounded off. The lower half is downy, the barbs having unconnected barbules, and is of a brownish grey colour. In the upper half the barbs are rather distant, unconnected, and without barbules. The brownish grey of the lower part passes here gradually into black, which colour it keeps as far as the rounded tip, which is pure white, forming a narrow segment of a circle. The shaft is not produced.

"In the double feather the tube is $\frac{1}{4}$ of an inch long, and narrow; the main shaft is broken off at $2\frac{3}{4}$ inches from the tube, before it has arrived at the black colour. The after-shaft is $4\frac{1}{4}$ inches in length, and nearly $\frac{1}{2}$ an inch broad at the tip. It is coloured exactly like the feather just described. I judge from this that the main shaft must have been about 6 inches in length, and therefore an inch longer than the after-shaft. The annexed sketch of one of the single feathers may assist you in understanding my description. It is of the natural size.

"I remain,

"Yours truly,

(Signed) "F. W. Hutton."

"Prof. Owen, F.R.S."

This letter was speedily followed by confirmatory intelligence from Dr. Hector, F.R.S., of the finding of both skin and feathers of a Moa in another locality, the part of the bird retaining the tegumentary structures being the neck.

"Geological Survey,
Wellington, October 28, 1871.

"Dear Professor Owen,

"I have just received Dr. Thomson's account of his exploration of the cave where the Moa's neck was found. It is not very satisfactory; but there appears to have been many birds in such a position that their bodies must have slid down into a fissure. He appears to have secured a fine collection, among them being a complete skull with trachea attached, also fragments of skin and muscular tissue. He also sends me a few Moa-feathers, which were found by a digger, 18 feet from the surface, in alluvium. I enclose two of these feathers for you.

1 Capt. Hutton has since published a more careful figure of a better-preserved feather, which is copied in Plate CXIV, fig. 11."
"I will get all the information on the subject, and, if possible, examine the locality myself this summer. I have forwarded some publications to you by this mail, which I trust you will receive.

"Very sincerely yours,
(Signed) "JAMES HECTOR."

In the 'Transactions of the New-Zealand Institute,' vol. iv. 1872, my friendly correspondent states:—"I have now to describe another remarkable specimen from the same district, being the cervical vertebrae of a Moa, apparently of the largest size, upon the posterior aspect of which the skin, partly covered with feathers, is still attached by the shrivelled muscles and ligaments.

"The specimen in question belongs to Dr. Thomson, of Clyde, who obtained it from a gold-miner, and kindly forwarded it to me for description. It was discovered in a cave, or under an overhanging mass of mica-schist, the locality being thus described by Dr. Thomson, who has since visited it." After the account of the locality, Dr. T. proceeds to state:—"At our first visit, and on entering the first floor, our attention was attracted to the remains of a fire. We found numerous charred bones, both Moa-bones and sheep-bones, pieces of wood and spear-grass. No bones worthy of note were obtained here; but on entering the second floor, and by scraping away the loose dirt to a depth of two feet, we came upon numerous bones—femora, tibiae, fibulae, ribs, vertebrae, tracheal rings, and pieces of skin and muscle, also bones of the toes and tarsal bones and a portion of a pelvis. On one of the thigh-bones portions of muscular tissue are observed in pretty good preservation, and found on the same spot where the portion of neck was found."

The total length of this portion Dr. Hector gives as "16·5 inches." "It includes the first dorsal and last six cervical vertebrae, with the integument and shrivelled tissues enveloping them on the left side. The surfaces of the bones on the right side, where not covered by the integument, are quite free from all membrane and other tissues, but are quite perfect, without being in the least degree mineralized. The margin of the fragment of skin is sharply defined along the dorsal edge; but elsewhere it is soft, easily pulverized, and passing into adipocere.

"The circumference of the neck of the bird, at the upper part of the specimen, appears to have been about 18 inches, and the thickness of the skin about $\frac{3}{16}$ of an inch.

"The only indication of the matrix in which it had been imbedded was a fine micaceous sand that covered every part of the specimen like dust, there being no clay or other adherent matrix. On removing the sand with a soft brush from the skin, it was discovered to be of a dirty red-brown colour, and to form deep transverse folds, especially towards the upper part.

"The surface is roughened by elevated conical papillæ, from the apex of some of
which springs a shorter transparent feather-barrel, never longer than half an inch. On the dorsal surface a few of the quills still carry fragments of the webs, some being two inches in length. From this it appears that the colour of the barbs was chestnut-red, like *Apteryx australis*, but that they had two equal plumes to each barrel, as in the Emu and Cassowary, and in that respect differed from the *Apteryx*, the feathers of which have no after-plume. On the other hand, the barbs of the webs of the feathers do not seem to have been soft and downy towards the base as in the Emu.”¹. As however, not any of the feathers had preserved their entire length, the equality of the after-plume in that dimension with the main plume is doubtful.

With regard to the preservation of the skin on the pelvic bones and cervical vertebrae of Moa-skeletons, it may, in part, be due to its unusual density and thickness in that bird, in which character the Kivi resembles its extinct allies.

I have already had occasion to remark:—“In the *Apteryx* the cutaneous system of muscles presents a more distinct and extensive development than has hitherto been met with in the class of Birds, a condition which is evidently connected with the peculiar thickness of the integument”². So also Dr. Buller remarks:—“In preparing my specimens of *Apteryx mantelli* I was astonished at the toughness of the skin.” And Mr. Dawson Rowley was led to observe:—“I have a portion of the skin of an adult male *Apteryx* before me; this is so thick that a pair of light shoes might easily be made of it. In setting up these birds, the toughness of the skin is such that it can hardly be relaxed: water has little effect upon it. It resembles leather.”³.

We need be the less surprised, therefore, to hear of cases of preservation of the thicker and harder skin covering the nude parts of the legs and feet. The Manuherikia instance (1864) has already been noticed (pp. 154 and 248). Ten years later the following parts were discovered in a crevice amongst the mica-schist rocks at Gallo-way station in the same (Manuherikia) district. They consisted of a right metatarsus with parts of the toes, a fragment of the left metatarsus, a right tibia, a left femur, and a fragment of a sternum. Capt. Hutton, in his memoir on these remains, states:—“Judging by the measurements, I believe them to belong to *Dinornis ingens*, Owen”⁴.

In the right metatarsus “the whole of the skin and muscles of the posterior side are well preserved, while on nearly the whole of the anterior side they have gone. The bone thus exposed is bleached quite white, and the animal matter so much removed that the bone adheres to the tongue like ordinary Moa-bones found on the surface.

“The hind toe (hallux) is well preserved, being held in its position by the skin. Of the inner toe only the first joint remains, together with the flexor tendons. Of the middle toe the first two joints are left united with the skin of the sole of the foot. Of

¹ *Tom. cit.* p. 114.
² *Ante*, p. 42.
³ Buller, ‘Birds of New Zealand,’ 4tho, 1873, p. 363. This is an exception to the character of the corium assigned to the class of birds in anatomical works.
⁴ *Trans. New-Zealand Institute*, vol. vii. 1875, p. 266.
the outer toe all the joints are in their places, and the skin still covers the lower outer and part of the upper surfaces.

"The integument on the under surface of the toes is covered with small conical papilæ, about $\frac{1}{10}$ of an inch in diameter at the base, which increase in size towards the sole of the foot. There is a marked protuberance under the first and second joints of the outer toe. The papilæ here are larger and closely packed together, while on the outside of the toe they are small and rounded. On the back of the metatarsus the integument is covered by large irregular prominences nearly half an inch in diameter, divided by grooves from a tenth to a twentieth of an inch across, which are rough to the touch. These prominences are worn down quite flat, as proved by their striate surfaces, showing that the Moa, like the Emu, spent a considerable portion of its time with the lower surface of the metatarsus resting on the ground. On the sides of the leg the prominences are flat, slightly lengthened longitudinally, and with a divided wart-like surface; they are about the same size as those on the lower surface, but are set closer together, and are arranged in irregular longitudinal rows. On the sides of the tibio-metatarsal articulation the prominences are smaller, more rounded, and higher. Judging from the fragment of integument left on the anterior side of the metatarsus, its surface appears to have been covered with flat, more or less rounded, prominences in quincuncial arrangement, separated by flat smooth interspaces about a tenth of an inch wide. There is no appearance of its having been covered with horny scales as in Apteryx."

Such 'scutella' may, however, have been present in the missing integument. Those in front of the metatarsus in Apteryx are comparatively small, close-set, with overlapping margins, and vary somewhat in proportion according to the age of the bird as well as in the species: in the large grey Kivi (A. haastii), e. g., the scutellæ are broader than in A. oweni and A. australis. "In colour the dried integument is yellowish brown, getting paler on the posterior surface." In conclusion, Capt. Hutton remarks, "that the extraordinary juxtaposition of decayed and lichen-covered bone with well-preserved skin and flesh, seems to me to point to some peculiarity in the atmosphere which enables flesh to resist decay when shaded from the rays of the sun, and by no means to prove that the bird to which the skin and flesh belonged lived at a later date than those whose bones we now find buried under the soil".

The ecto- and endo-condylar fossæ and the intercondylar ridge were covered by their articular cartilage, brown and dry through exposure.

From the remnants of ligamentous and tendinous structures attached to the metatarsus, some repetitions of the muscular arrangements in the Apteryx (noted above, pp. 54–61) appear to have been detected by the able comparative anatomist, Dr. Coughtrey. The specimen is in the Otago Museum.

1 Tom. cit. p. 268.
Subsequent to the reception of Moa-feathers from the deposits at the junction of the Manuherikia with the Molyneux river, Capt. Hutton was shown more feathers, which had been found between Alexandria and Roxburgh, 18 feet below the surface. "The feathers," he states, "from both these places are so much alike that there can be little doubt but that they belong to the same species of bird, their differences being simply due to their coming from different portions of the body. They are all quite fresh in appearance, and the colouring is as bright as if just plucked from the bird; but unfortunately all are more or less broken, and only one" (in the Otago Museum) "shows the tube that enters the skin. In this feather the length of the tube is \( \frac{1}{25} \) of an inch, and it contains two plumes or feathers. The main plume is unbroken, and is 4·75 inches in length, and 0·5 of an inch broad at the tip; the other or accessory plume is 2·75 inches long and broken off, but in size it almost equals the main plume. The greater number of the feathers gradually enlarge from the tube to the tip, where they are rather bluntly rounded off; some, however, especially the more downy ones, have the sides more parallel. The largest was 7 inches long and 0·75 of an inch broad at the tip. The barbs are unconnected and rather distant, but not so much so as in most struthious birds. They are furnished with barbules up to the very tips of the feathers, except in a few cases where for a short distance the barbs are simple. No barbicels exist in any part of the feathers; the down portion is simply formed by the barbules being more elongated and set closer together. The shafts are slender and flexible, and do not project beyond the barbs. In colour the feathers are brown for about the basal two thirds, the more downy ones being of a redder brown than the others. This brown gradually shades off into black, which colour is kept as far as the rounded portion of the tip, which is pure white. The shaft is of the same colour as the feather" 1.

It thus appears that in other species of Moa besides the *Dinornis robustus* the feather has a well-developed accessory plume, and that the barbules are destitute of barbicels.

The presence of the accessory plume distinguishes such feather from that of any known species of *Apteryx*, and its relative size from the feather in *Dinornis* and *Casuarius*, in both which genera the 'accessory' equals or nearly so the 'main plume,' at least in the larger feathers of the trunk. In *Rhea* the accessory plume is represented by a tuft of down: in *Struthio* it is wanting.

In the type Kivi (*Apteryx australis*) each dorsal feather has the shaft and basal parts of the barbs rufous brown, the major (distal) parts of the barbs are black. The quill-tube is extremely small, narrow, and flexible. The downy part at the base of the feather is largely developed; the barbules are fine and long, giving to each barb the semblance of a miniature feather. In the North-Island variety (*A. mantelli*, Bart.) the tip is stiff and pointed, and on the upper and hinder parts of the body the shaft is produced to a sharp point, giving a rigid character to the plumage. In remote

localities of the North Island, and more widely diffused in the South Island, there still exists a smaller species of *Apteryx* (*A. oweni*, Gld.), of which the plumage resembles that in (some species of) *Dinornis* in being softer and less rigid than in *A. mantelli*, in having a shorter basal downy portion, and in the tip of the feather being of a markedly lighter colour than the rest of the vane, which also presents portions or bars of fulvous brown and blackish brown. The analogous shades observable in the disinterred feathers of the Moa, and especially the lighter tip, perhaps blanched to whiteness, must have given, at least to the species of *Dinornis* to which the feather (Plate CXIV, fig. 11) belonged, a banded or mottled character.

A larger banded kind of *Apteryx* (*A. haastii*, Blr.), obtained on the high ridges above Okarita, on the west coast of the South Island, affords plumes approaching in size, nearer than in *A. oweni*, to those of the *Dinornis* above described; but the terminal tip is less marked. There is, however, as little appearance of an accessory plume in this as in other known kinds of Kivi.

In the "Notes on Moa-Caves in the Wakatipu District," communicated by Taylor White, Esq., to the Otago Institute, it is stated that at "thirty feet from the entrance, in the two-inch crust, a small quantity of double-shafted feathers, of a greyish brown colour and three inches long, were obtained." "Further on was a small collection of short sticks, fern and broom, which might be the remains of a nest. Here the feathers were scarcer, and a metatarsus was found in good preservation which measured 8 inches in length, $6\frac{7}{8}$ girth at proximal end, $3\frac{7}{8}$ at thinnest part, and $8\frac{3}{8}$ girth at distal end; also portions of egg-shell of a green colour, which appeared to be parts of a large egg." ¹

The above dimensions of the metatarsal indicate its having formed part of a female of *Dinornis casuarinus*. Supposing the egg-fragments as well as the 'double-shafted' feathers to have been those of a Moa, they support Mr. Dallas's conclusion of the nearer affinity of *Dinornis* "to the green-egged Emus and Cassowaries" than to the Rhea and Ostrich. Capt. Hutton remarks:—"The green egg-shell from the cave at Mount Nicholas proves, on microscopical examination, to have the true *Dinornis* structure [see ante, p. 317]. It is of a rather pale sea-green colour, smooth, but not polished." "The feathers from this cave are not very well preserved. Most of them are pale yellow-brown, margined with darker, while a few were dark brown. The largest is $6\frac{1}{2}$ inches. The feathers from the cave near Queenstown are in an excellent state of preservation, and many have both shafts quite complete. The 'after-shaft' is much more slender than the true shaft, but often nearly as long; the barbs gradually get more distant from one another towards the apex, and they are generally opposite on each side of the shaft. I saw no signs in any of the feathers of the barbs near the base being in groups of four or five, as described by Mr. Dallas in the 'Ann. & Mag. Natural History,' 3rd series, c. 16, p. 66, in the feathers of *D. robustus*. There are

¹ Trans. of the New-Zealand Institute, 1876, vol. viii. p. 98.
no barbules on the barbs near the apex of the feather, and the shaft is not produced beyond the barbs. In colour these feathers are reddish brown, with a central longitudinal dash of dark brown towards the apex of the shaft. The down is brownish white.” “These two caves, therefore, have furnished two new kinds of Moa-feathers, making three distinct kinds that are now known.”

As of the four existing species or established varieties of Apteryx, some have a barred, others a more uniformly coloured plumage, so the more numerous species, now extinct, of the Dinornis seem to have exhibited analogous differences of colour.

The sum of the discoveries of the remains of Moas in Maori cooking-gounds, and of eggs, skin, and feathers in caves, graves, &c., points to the recent period, scarcely, I think, to be carried back beyond one or two centuries, of the extirpation of the species of the Dinornithidae.

Mr. W. J. Hamilton shrewdly remarks:—“In 1844 little was known among the European population of the existence of Moa-bones, and very few had been found; but the Maoris always knew them when they saw them. It is a curious fact to note that they should have a name for the extinct bird’s bones if it had never been known to their ancestors as a living bird.”

In reference to the statement (p. 443), “We found numerous charred bones, both Moa-bones and sheep-bones,” if clear and satisfactory evidence had been adduced that these were mingled in the ashes of one and the same fire, the conclusion would be sustained that some kind of Moa was in existence after the introduction by Europeans of the sheep, the correctness of the reference of the bones to that domestic ruminant being admitted.

Another testimony to a similar conclusion has appeared in a New-Zealand newspaper:

“Antiquity of the Moa.—The ‘Otago Daily Times’ says that a valuable piece of evidence, which points to the probability of the Moa having lived in comparatively recent times, has just been brought to light. When in London, Dr. Hector ascertained that in the British Museum there were certain cases which had been brought from New Zealand by Capt. Cook, and which were still unopened. Dr. Hector was allowed to examine the boxes, which contained Maori curiosities, and in one of them was a spear ornamented with a tuft of Moa-feathers. With the permission of the Trustees of the Museum he detached one of the feathers, and he has brought it out to New Zealand. Strange that this evidence should have reposed in the cellars of the British Museum for a century.”

I submitted this paragraph, reflecting on the “Department of Mediæval Antiquities,”

to my esteemed colleague the Keeper of that department, and received from him the following note:

"Dear Professor Owen,

The paragraph which you have shown me from a New-Zealand paper is singularly inaccurate.

First as to Capt. Cook's collection: that portion that was sent to the Museum (a very small one, I suspect) was exhibited in old Montagu House, and removed to the present Ethnographic Room before I came to the Museum in 1851. I have never found any cases containing specimens from the collection not unpacked; and, in fact, in a great rummage I made through our stores when I came, I did not discover any cases of ethnological specimens.

The specimens from New Zealand to which the paragraph refers are not, as you are aware, at the British Museum at all, but form part of the 'Christy Collection,' deposited at 103 Victoria Street. I do not know where Mr. Christy obtained them, or whether they were brought back by Capt. Cook.

Dr. Hector was looking over the collection of New-Zealand objects, and kindly giving me information about them, when he saw the iron fish-hook with the black feathers, and I then called his attention to the hani similarly ornamented.

As to whether the feathers are Moa or not I will not venture to say, but leave it to those better qualified to give an opinion.

Yours sincerely,

Augustus W. Franks.

Neither of the Christy specimens were packed away, but exhibited in the glass cases."

I have critically examined every feather in these dateless New-Zealand implements, and I subjoin a description of one of the feathers, which, by their size, had best claim to be deemed of a Moa. It is from the 'hani' examined by Dr. Hector.

This feather is 5 inches 2 lines in length, 2 inches in breadth at its broadest part midway between the quill and tip of the vane. An extent of quill of 4 lines is preserved, including rather more than 1 line of the transparent hollow inserted portion.

After two lines extent of the solid opake portion of the 'quill' or 'barrel,' where it assumes the structure of the 'shaft,' the 'vane' commences by lateral series of white 'down-barbs'; the first pair are half a line in length, increasing at the sixth pair to 3 lines in length, and at the tenth suddenly lengthening to 5 lines; the tip of this barb assumes the greyish-brown tint which prevails over more and more of the lengthening barbs, until the basal whitish downy character disappears at about an inch from the beginning of the series of barbs. These, at first rapidly, then gradually, gain in length to near the mid-length of the feather, where the barb attains 1 inch 3 lines in length. The breadth of the feather there is reduced by the oblique and wavy dis-
position of the barbs. They quit the shaft by curving outward with the convexity toward the tip; then continue with a more gentle bend concave toward the tip and inclining thereto.

As the barbs approach the mid-length of the feather the barbules cease to be developed at the tip of the barb, and the simple filamentary terminal part of the barb forms a greater proportion of its length as the barbs decrease in total length and approach the tip in position.

The grey-brown colour of the barbs preserves the same degree from the basal third to the tip of the feather. The dorsal part of the shaft approaches to blackness at its mid-length and continues to the tip.

The barbules connect the barbs together for the extent of a line and a half along the basal third of the feather, and for a gradually decreasing length to the apical third, where the barbs become free in their whole extent as far as the tip.

The differences which this feather presents as compared with that of the *Dinornis* described in the preceding pages, and figured in Plate CXIV., are as follows:—

1st. The entire absence of an accessory plume or 'after-shaft.'
2nd. The downy barbs at the base of the main shaft.
3rd. The greater breadth as compared with the length of the feather.
4th. The gradual diminution of breadth from the second third part of the length of the feather to the tip, which is pointed.
5th. The absence of the white colour which distinguishes the broad truncate tip of the Moa-feather, Plate CXIV., fig. 11.
6th. The absence of barbules at the terminal portions of the barbs along the apical half of the feather.

In each and all of these differences the feathers adorning the New-Zealand weapon accord with those of the *Apteryx*. If feathers of 5 inches 2 lines in length cannot be found in any individuals of existing kinds of Kivi, a species larger than these may have afforded the ornament in question. Those attached to the 'fish-hook,' which is of iron, are too mutilated and decayed to yield reliable characters.