

It may be mentioned that an *Astronomische Nachrichten* circular note contains rather a modified edition of the above places deduced from observations made on October 16, 20, and 25.

Thus for the 13th, the R.A. is given as 20h. 54m. 24s. (app.), and declination (app.) + 1° 54' 5"; and for the 17th, R.A. (app.) 21h. 6m. 39s, and declination (app.) + 0° 46' 4".

COMET BROOKS (AUGUST 28).—Owing to the rapid brightening of Comet Brooks, we give the following ephemeris continued from the same source as mentioned last week (*Astronomische Nachrichten*, No. 3125).

12h. Berlin M. T.

1892.	R.A. app. h. m. s.	Decl. app.	Log r.	Log Δ.	Br.
Nov. 11...	9 56 50	+ 3 18' 7"			
12...10	1 8	2 24' 6"	0'0985	9'9861	15'61
13...	5 29	1 29' 6"			
14...	9 52	+ 0 33' 8"			
15...	14 17	- 0 22' 9"			
16...	18 45	1 20' 3"	0'0847	9'9712	17'81
17...	23 15	2 18' 4"			

OCULTATION OF MARS AND JUPITER BY THE MOON.—

Prof. Barnard communicates his observations of the occultation of Mars and Jupiter by the moon, which occurred in one week during last September, to the *Astronomical Journal*, No. 276. The instrument used was the 12-inch equatorial and the seeing was defined as being very fine on both occasions. At the disappearance of the former planet, which took place at the dark limb of the moon, nothing very striking was noticed, the moon's limb at that point being sharp and not dusky, as had been previously seen in an occultation of Jupiter. The times of disappearance and appearance (Mount Hamilton mean time) were:—

	Disappearance. h. m. s.	Reappearance. h. m. s.
1st contact	9 9 35' 8"	10 45 56' 0" (1s. late?)
Half obscured	9 10 4	10 26 17
2nd contact	9 10 37' 1"	10 26 52' 2"

In the case of Jupiter, which disappeared at the bright limb, a narrow shadow band was noticed fringing the limb where the planet appeared to cut it. This is due, as Prof. Barnard thinks, to the effect of contrast. The times of contacts were as follows:—

	Disappearance. h. m. s.	Reappearance. h. m. s.
1st contact	17 28 10' 4"	18 33 17' 5" (2s. late?)
Half obscured	17 28 55' 0"	18 33 50
2nd contact	17 29 45' 7"	18 34 33' 7"

MOTION OF THE SOLAR SYSTEM.—The question of the exact position of the point in the heavens to which the sun with his system is travelling has been the object of much research and computation, and the present co-ordinates are now considered as being about R.A. 267° and declination + 31°.

The determination under consideration (*Astronomical Journal*, No. 276) has been undertaken by Prof. J. G. Porter, and is based on the proper motions of 1340 stars, contained in the Publication of the Cincinnati Observatory, No. 12. The method employed for computing the co-ordinates of the apex of the sun's way is that of Prof. Schönfeld; the stars were grouped in four divisions, Division I. including those whose yearly proper motion was less than 0".30 and contained 576 stars; Division II., motion from 0".30 to 0".60, containing 533 stars; Division III., motion from 0".60 to 1".20, containing 142 stars; and lastly, Division IV., the motion exceeding 1".20, 70 stars being included. From these four groups the following values have been deduced, where  $\sigma$  and  $\tau$  represent the co-ordinates of the apex of the sun's course and  $\frac{c}{\rho}$  the velocity of the sun's motion:—

	$\sigma$	$\tau$	$\frac{c}{\rho}$
I. ...	281' 9	+ 53' 7	0' 16
II. ...	280' 7	+ 40' 1	0' 30
III. ...	285' 2	+ 34' 0	0' 55
IV. ...	277' 0	+ 34' 9	0' 66

The last determination of these co-ordinates was made, if we are not mistaken, by Prof. Stumpe, and were given in *Astronomische Nachrichten*, Nos. 2999-3000. The values there de-

duced agree very well with those in question, with the exception of  $\tau$  in Group I. and  $\sigma$  in Group IV., which consequently throw the mean values rather out. Adopting the same notation, he obtained—

	$\sigma$	$\tau$	$\frac{c}{\rho}$
I. Group	287' 4	+ 42' 0	0' 140
II. "	279' 7	40' 5	0' 295
III. "	287' 9	32' 1	0' 608
IV. "	285' 2	30' 4	2' 057

Summing up the values obtained by some previous workers, the following table gives the co-ordinates obtained:—

Name.	R.A.	Decl.	No. of stars used in reduction.
Gauss	259' 2	+ 30' 8	—
Argelander	259' 9	32' 5	390
O. Struve	261' 5	37' 6	392
Mädler	261' 6	39' 9	2163
Airy	261' 5	24' 7	113
Dunkin	263' 7	25' 0	1167
Kancken	284' 6	31' 9	106
Birchoff	285' 2	48' 5	480
L. Struve	273' 3	27' 3	2509
Stumpe	285' 1	36' 2	1054
Porter	281' 2	40' 7	1340

SOME REMINISCENCES OF THE MAORIS.

MR. W. COLENSO, F.R.S., has often been asked to record some of his reminiscences of the Maoris, whom he has for very many years had opportunities of studying. This he has now done in a paper printed in the Transactions of the New Zealand Institute (vol. xxiv.), some extracts from which may be of interest for various classes of readers. He says:—

*Of the Mako Shark.*—Fifty years ago (to go no further back) a Maori chief would be known by wearing certain emblems or insignia indicative of rank, one of which was the tooth of the mako as an ear-pendant; and, as such were plentiful, though distributed, the thought often occurred to me in my early travelling days, What a number of the fish mako there must have been captured or obtained by the Maoris to yield such a large number of teeth! Moreover, on inquiry I invariably found that all the teeth I saw were prized heirlooms, and had descended to the present possessor through several generations, and (as far as I could learn) none had been recently acquired. And while, when travelling along the sea-coasts for many a league on both sides of the North Island during several years, and always on foot, I had both seen and heard of a number of large sea-animals (fishes and mammals) that were driven on shore on the sandy beaches in severe gales from the sea, I never knew of a single mako shark, nor had the Maoris resident on those shores ever heard of one being cast up.

In replying to my numerous inquiries by letter respecting the mako, made many years ago, an intelligent aged Maori chief living on the east coast wrote as follows (or, rather, he being of the old school, and unable himself to write, a young adherent did so at his dictation). I give a literal translation of portions of his letter:—

"You ask, did I ever see a mako fish? Yes; and it is a very large creature, the biggest of all the sharks (*mango*)—in length 2 fathoms measured (*erua maro whanganga nei*), and in thickness 1 foot. It is a true shark, but called by us a mako on account of its teeth. You also inquire concerning its fat or oil, and the edible qualities of its flesh, whether considered choice by us Maoris. Now, there are many kinds of shark, as the mako, the *karaerae*, the *pioke*, the *ururoa*, the *uatini*, the *tahapounamu*, the *taiari*, the *tatere*, and the *mangotara*, and I have not eaten of them all, and therefore I do not know how nice or how fat they all are; and so of this one, the mako. But, my friend, this fish was never desired as an article of food—never so used by us Maoris. The only part of it that we sought and greatly desired to have was its head, and this solely on account of its teeth. When caught out at the deep-sea fishing-grounds its body was never hauled into the canoe, but the head was cut off while it was still in the sea and alongside of the canoe (*ka tapahia moanatia te upoko*): this done, and the head secured, the body was left to drift away on the sea. The head was also immediately wrapped up securely in a clothing-mat (*kahu*), lest it should be noisily wondered at by those who

were strangers or unacquainted with it (*koi umeretia e nga tangata tauhou*). You also ask what instrument was used for cutting off the head of the *mako*. What, indeed! Why, the saw made of the teeth of the *tatere* shark firmly fixed on to a wooden blade (*he niho tatere, he mea hohou ki runga ki te rakau*). You further inquire respecting the number of its teeth. There are eight—that is, large ones from within—and also eight smaller ones of them outside. Besides those there were several much smaller ones in front or outside (*o waho rawa*), but these I never counted, and therefore cannot give their exact number."

He also wrote (in another and subsequent letter) in answer to my further inquiries: "There are four very large teeth from the beginning, or within. These are called *rei*, and are kept for ear-pendants. Altogether there are eight teeth—that is, four very large ones, and four smaller, making eight in all. The outside teeth resemble those of the *tatere* shark, and are only termed teeth (*niho*); these have no other name, but those that are kept for ear-pendants are called *au rei*. Then, you wish to know how the *mako* was captured by us Maoris in the olden times. Listen. This fish was never taken as other sharks (*mango*) were, with hook and bait: none of our fish-hooks would be strong enough to hold it, they would soon be broken. Now, when the fishing-canoe was out fishing, and had been a long time there catching fishes of various kinds, suddenly a *mako* would be seen coming leisurely along on the surface of the water (*e hara mai uoa ana i te kiri o te wai, ara i te kare o te wai*). Then the man who saw it would shout out to his companions in the canoe, "Haul up our land" (*Hautia mai to tauou whenua*), not naming the fish; and when the *mako* was pretty near to the canoe, about three yards off, then the big tempting bait was let low down before it, and on the *mako* seeing the bait it would bend down its head to seize it (*ka tupou te upoko*), when its tail would be upraised above water. Then a noosed rope would be flung over its tail (lasso-fashion) and quickly hauled tight, which would secure the tail within the noose hard and fast. And away would speed the canoe at a fleet rate towards all sides of the sea and sky, being continually turned about in all directions by the fish, the man who had noosed it always holding on to the rope. At last, being exhausted, the *mako* died; then it floated, when its head would be cut off, as I said before. This was our common manner of catching the *mako* fish (*ko tonu hii tonu tenei o tenei ika o te mako*), often also called by us a monster (*taniwha*); and hence arose the term of monster-binding (*heretanwha*), owing to it being securely noosed and bound with a rope flung over its tail." Here ends the interesting narration of my worthy old Maori correspondent, who died soon after.

I have never seen a *mako* fish, and I am in doubt whether it is yet fully known to science. It is evidently one of the deep-water fishes. The first mention of it by skilled scientific observers that I have noticed is in Sir James Ross's "Voyage to the South Seas," wherein it is stated that on nearing the Chatham Islands, in November, 1841 (within a week after leaving their winter quarters and anchorage in the Bay of Islands), "the long-snouted porpoises were particularly numerous. One of these creatures was struck with a harpoon, and in its formidable jaws we found the teeth which the New-Zealanders value highly as ornaments, and which had puzzled us greatly to ascertain to what animal they belonged" (vol. ii., p. 134). Those Antarctic Expedition ships had spent several months in the Bay of Islands, and the officers had frequent opportunities of seeing and examining the teeth of the *mako*, and very likely had purchased some from the Maoris, as they were diligent in acquiring natural specimens, and curios and ornaments of all kinds.

Professor Hutton, in his "Catalogue of the Fishes of New Zealand" (published by the Government in 1872), considered the *mako* to be the "*Lamna glauca* = tiger-shark;" but he says, "The shark from which the Maoris obtain the teeth with which they decorate their ears is probably this species, but I have seen teeth only" (*l.c.*, p. 77).

Subsequently Professor Julius von Haast (in 1874) read a paper before the Philosophical Institute of Canterbury (Trans. N.Z. Inst., vol. vii., p. 237) on the *mako* of the Maoris, which, he says, is *Lamna cornubica*, the porbeagle shark, and not *L. glauca* as had been supposed by Professor Hutton. But Professor von Haast had only a small young specimen (or, rather, its skin) to examine, which two North Island Maoris, then engaged at Christchurch Museum, pronounced to belong to

a young *mako*, and informed him that this fish in its adult state was about 12ft. long. The animal to which the skin belonged was 4ft. 10in. long. Professor von Haast also gives much information relative to the teeth of his small specimen (differing widely from my Maori friend's description given above), their number, form, and size, the colour of its skin, &c. Still, as I take it, there are reasonable doubts as to that specimen being a true *mako*; I think it is highly probable that his two Maori informants had never seen a real *mako* shark.

Couch, in his celebrated work on "British Fishes," in his account of the porbeagle shark, gives a drawing of it from nature, and also others of its teeth and jaws, which appear to be different from those of the *mako*, being much more slender, and semi-terete, undulate, and sharply pointed (vol. i., pp. 41-44).

My object in writing this notice of the *mako* shark is mainly to relate the ancient Maori mode of capturing it.

*Of the Preparation of Black Pigment for Tattooing.*—The ancient Maoris had more ways than one of obtaining the black substance used in tattooing, which colouring-matter also varied in quality, partly owing to what it was made from; that for the countenance being superior to that used for the lower parts of the body. One way of obtaining the best kind was as follows:—

First, two proper careful men were selected for the work. This, too, was done with ceremony, they being (for the time) *tapu* (*i.e.*, under the laws of *taboo*)—rigidly set apart. A small kiln-like furnace (*ruangarehu*) was excavated in the side of a hill suitably situated. The substances to be used in burning for their soot—*kauri*-resin (*kapia*) and the resinous veins of white pine wood (*kapara*)—were got ready; a net made from the *wharanui* flax leaves finely split, composed of very small and close meshes, and beaten well, so as to be rough and scabrous from long broken fibres, in order the better to catch and retain the soot (*awe*), which was intended to adhere only to the network: this net was fixed properly and securely over the top opening or chimney of the kiln, and above it were placed thick mats and such like, to prevent the escape of the burning soot and smoke. All being ready, a very calm fine night was chosen for the firing of the kiln—a night in which there should not be the least breath of moving air; and, the kiln being fired, those two men remained all night at their post, attending to their work, carefully feeding the fire. When all the resinous substances were burnt up, and the kiln cold—the calm weather still continuing—the soot was carefully collected and mixed up with the fat of birds, and then given to a Maori dog to eat, which dog had also been early set apart for this work—tied up, made to fast, and kept hungry, that it might perform its part and eat the prepared morsels with avidity. After devouring the mixed food the dog was still kept tied up, and not allowed to eat any other aliment until it had voided the former. When the fæces were evacuated they were carefully gathered, and mixed up and kneaded with bird's oil and a little water, and, when this mixture became dry and hard, it was put up securely into a large shell, or into a hollowed pumice or soft stone, and laid by carefully, buried in the earth, for future use. It is said to have possessed no disagreeable odour when dry (though it had while fresh), and, though long kept, it did not become bad nor spoil through keeping, which, on the contrary, was said to improve it, and it was very much prized.

It was this pigment, so put up and kept, that was the origin of one of their proverbs, "*Puritia to ngarahu kauri*" = Keep to thyself thy *kauri*-resin-soot pigment. This saying was used when a person was unwilling to give what was asked, the same being some common thing, and not at all needed by the avaricious owner. But there is a double meaning here in this simple sentence (proverb)—namely, "You may never require it, or live to use it." (See Trans. N.Z. Inst., vol. xii., p. 145.)

*Of the Manufacture of their Long Spears.*—Some of their spears were very long. Of these there were two kinds. One kind was made of hardwood, *rimu* (*Dacrydium cupressinum*). This was used in defending their forts and stockades before the introduction of firearms, being thrust through the palisades at close quarters against the legs and bodies of the invaders. The other kind was much lighter, though longer, being made of the light wood of the *tawa*-tree (*Beilschmiedia tawa*), and used only for the spearing of pigeons when they were sitting on the top of a high tree. This spear was tipped with a flattish serrated bone 3 inches—5 inches long, usually coarsely barbed on one lateral edge, and sharply pointed; the bone being human, and a portion of that of the arm or leg, and, of course, of their

deadly enemies. Seeing that these long spears were always made from heartwood of their tallest trees, it was a mystery to me how they managed to manufacture them, the hardwood ones being from 16 feet to 20 feet and the others from 20 feet to 35 feet long; and it was not until my first visit to the Urewera Tribe, at Kuatahuna, in the interior beyond Waikare Moana, in 1841, that I discovered how it was effected. This patient performance has ever seemed to me a notable example of one of their many laborious and persevering works. For it must never be forgotten, in considering their ancient laborious and heavy works, especially in hard substances, as wood, bone, and stone, that they accomplished all without the use or knowledge of iron or any other metal.

First, a straight, tall, and sound *tawa*-tree was selected in the forest. This was felled with their stone axes. Its head and branches having been lopped off, it was dragged out into the open ground, and split down the middle into two halves. If it split easily and straight, then it would probably serve for two spears, if each half turned out well in the working. The next thing was to prepare a long raised bed of hard tramped and beaten clay, 35ft.-40ft. long—longer than the intended spear—the surface to be made quite regular and smooth (like a good asphalted kerb town walk of the present day). On to this clay bed the half of the *tawa*-tree was dragged, and carefully adzed down by degrees, and at various times, to the required size and thickness of the spear. It was not constantly worked, but it was continually being turned and fixed by pegs in the ground, to keep it lest it should warp and so become crooked. It took a considerable time—about two years—to finish a spear. The last operation was that of scraping with a broken shell or fragment of obsidian, and rubbing smooth with pumice-stone. When quite finished and ready for use a suitable tall and straight tree was found in, or on the edge of, the forest; its trunk was trimmed of branchlets, &c.; the long spear was loosely fixed vertically to it, so as to run easily through small round horizontal loops girt to the tree, and placed at some distance from each other; the tip of the spear concealed, yet protruding near the topmost branches of the tree; and, as the pigeon is a very thirsty bird (especially, I should think, after feeding on the large fruits of the *tawa* and of the *miro*—*Podocarpus ferruginea*—trees, which are hot and piquant), the Maoris made small corrugated vessels of the green bark of the *totara* tree that would hold water, and fixed such on the top of the tree to which the long spear had been lashed, and by-and-by, when the bird was settled above after drinking (for it is a very quiet bird, sitting long after feeding), the spear was gently pulled down by its owner below on the ground, and sent up with a jerk into the body of the pigeon. I have seen the fixed spear thus used in the forests, and have eaten the bird so captured.

I may here mention that I have also seen those *totara*-bark dishes, with water in them, fixed high up on the big branches of trees in the woods in the Urewera country, having flax nooses so set over the water as to catch and hold fast the pigeon in its drinking. I have seen pigeons so caught, the Maoris climbing the trees naked with the agility of monkeys to secure their prizes.

From the large amount of labour and the time consumed in the making of a long spear, and its great beneficial use when made, arose a good proverb among them relative to industry in tillage, &c., and to being prepared—“*Kahore he taranga tahere i te ara*”—“You cannot hew a bird-spear by the way. Meaning: Without timely preparation you may die from want of food, though the pigeons are plentiful in the forests near you.”

Of the *Fine Smelling-sense and Taste of the Ancient Maoris for Perfumes*.—I have already more than once, and in former papers read here before the Institute, touched on the superior powers of sight of the ancient Maoris;<sup>1</sup> and it has often occurred to my mind that they also possessed a very keenly developed sense of smell, which was largely and quickly shown whenever anything sweetly odoriferous, however fine and subtle, had been used—as eau de Cologne, essence of lavender, &c. Indeed, this sense was the more clearly exhibited in the use of their own native perfumes, all highly odorous and collected with labour. Yet this sensitive organization always appeared to be the more strange when the horribly stinking smells of two of their common articles of food—often, in the olden times, in daily use—are considered: rotten corn (maize, dry and hard, in the cob) long steeped in water to soften it; and dried shark. The former,

however, has long been abandoned; yet at one period every village at the North had its steeping-pit.

In a paper I read here at our June meeting I mentioned some of the very small Hepaticæ (*Lophocolea* and *Chiloscyphus* species) as being used for perfume by the Maoris, who called them *piripiri*. Their scent was pleasant, powerful, and lasting. Hooker, in describing those plants, has mentioned it from dried and old specimens. Of one species, *Lophocolea pallida*, he says, “odour sweet;” of another, *L. novæzealandiæ*, “often fragrant;” of another, *L. allodonta*, “odour strong, aromatic;” of another, *Chiloscyphus fissistipus*, “a handsome strongly-scented species:” and he has further preserved it to one of them in its specific name, *C. piperitus*, “odour of black pepper.”

There were also two or three ferns—viz., *Hymenophyllum sanguinolentum*, a very strong-smelling species, hence too its specific name; dried specimens not only retain their powerful odour, but impart it to the drying papers: *Polypodium pustulatum*, having an agreeable delicate scent: and *Doodia fragrans*, a neat little species; this last was so far esteemed as sometimes to give name to the locality where it grew, as *Puke mokimoki*,<sup>1</sup> the little isolated hill which once stood where the Recreation-ground now is in Napier; that hill having been levelled to fill in the deep middle swamp in Monroe Street.

One of the *Pittosporum* trees, *tawhiri* (*P. tenuifolium*), also yielded a fragrant gum; but the choicest and the rarest was obtained from the peculiar plant *taramea* (*Aciphylla colensoi*), which inhabits the alpine zone, and which I have only met with near the summits of the Ruahine Mountain-range, where it is very common and very troublesome to the traveller that way. The gum of this plant was only collected through much labour, toil, and difficulty, accompanied, too, with certain ceremonial (*taboo*) observances. An old *tohunga* (skilled man, and priest) once informed me that the *taramea* gum could only be got by very young women—virgins; and by them only after certain prayers, charms, &c., duly said by the *tohunga*.

There is a sweet little nursery song of endearment, expressive of much love, containing the names of all four of their perfumes, which I have not unfrequently heard affectionately and soothingly sung by a Maori mother to her child while nursing and fondling it:—

Taku hei piripiri,  
Taku hei mokimoki,  
Taku hei tawhiri,  
Taku kati-taramea.

My little neck-satchel of sweet-scented moss,  
My little neck-satchel of fragrant fern,  
My little neck-satchel of odoriferous gum,  
My sweet-smelling neck-locket of sharp-pointed *taramea*.<sup>2</sup>

Here I may observe that to the last one of the four the word *kati* is prefixed: this word—meaning, to sting, to bite, to puncture, to wound sharply and painfully—is added to indicate the excessive sharpness of the numerous leaves and leaflets of the *taramea*-plant (hence judiciously generically named by its early discoverer, Forster, *Aciphylla*=needle-pointed leaf), and the consequent pains, with loss of blood, attending the collecting of its prized gum, thus enhancing its value.

This natural and agreeable little stanza, one of the olden time, has proved so generally taking to the Maori people that it has passed into a proverbial saying, and is often used, hummed, to express delight and satisfaction—pleasurable feelings. And sometimes, when it has been so quietly and privately sung in a low voice, I have known a whole company of grey-headed Maoris, men and women, to join in the singing: to me, such was always indicative of an affectionate and simple heart. How true it is, “One touch of nature makes the whole world kin!”<sup>3</sup>

In the summer season the sleeping-houses of their chiefs were often strewed with the large sweet-scented flowering grass *karetu* (*Hierochloa redolens*). Its odour when fresh, confined in a small house, was always to me too powerful.<sup>4</sup>

<sup>1</sup> Mokimoki Hill, from *mokinoki*, the name of that fern.

<sup>2</sup> See Trans. N.Z. Inst., vol. xii., p. 148.

<sup>3</sup> It is pleasing to notice that the observant artist Parkinson (who was with Sir Joseph Banks as his botanical draughtsman, and Cook on his first voyage to New Zealand) makes special mention of those little satchels in his Journal, saying of these Maoris who came off to the ship in their canoes, “The principals among them had their hair tied up on the crown of their heads with some feathers, and a little bundle of perfume hung about their necks” (Journal, p. 93). Captain Cook, also, has similar remarks respecting the young women.

<sup>4</sup> Sir J. D. Hooker thus writes of this fine, sweet-smelling grass in his “Flora Novæ Zealandiæ”: “A large and handsome grass, conspicuous for its delicious odour, like that of the common vernal grass (*Anthoxanthum*) of England, that gives the sweet scent to new-made hay” (*l.c.*, vol. ii., p. 300). A closely-allied northern species (*H. borealis*), which was also supposed to

<sup>1</sup> Trans. N. Z. Inst. vol. xiv. p. 67, &c.

Here, in conclusion, I may briefly mention an instance of their correct discrimination on the contrary side, clearly showing how well and closely the ancient New-Zealander agreed in his opinion of a plant with the highly civilized scientific visitor already named above, the botanist Forster. Forster named the *Coprosma* genus from the fetid odour of the first species he discovered in the South Island, which signification he also continued in its specific name, *C. fatidissima*; this shrub also bears a similar Maori name, *hupiro*, highly expressive of its very disagreeable smell.

*Of their Textile Manufactures.*—These were formerly prominent among the great industrial achievements of the Maoris, and always elicited the admiration of their wondering visitors.

I divide them into two great classes—(1) of garments, which were woven; and (2) of threads, cords, lines, and ropes, which were spun.

Nature had given to the Maoris one of her choicest gifts in the well-known flax plant (*Phormium*), of which there are two ascertained and valid species (*P. tenax* and *P. colensoi*), and several varieties. These plants are pretty general throughout New Zealand, and are well known to the Maoris by the common names of *harakeke*, *wharanui*, *wharariki*, and *tihore*—excluding those of the many varieties as known to them.<sup>1</sup> So that what they may have lost on the one hand through not having the valuable wild edible fruits of other South Sea islands (as the cocoanut, bread-fruit, plantain, &c.) they more than merely gained in their flax plant, which is also common, and almost endemic, being only found outside New Zealand in Norfolk Island.

And here I may briefly mention an anecdote of the flax plant. On my arrival in this country the Maoris (who knew nothing, or very little, of any other land) would often inquire after the vegetable productions of England; and nothing astonished them more than to be told there was no *harakeke* growing there. On more than one occasion I have heard chiefs say, "How is it possible to live there without it?" also, "I would not dwell in such a land as that." This serves to show how highly they valued it. Moreover, at first and for many years the principal export from New Zealand prepared by the Maoris was the fibre of this plant—all, too, scraped with a broken shell, leaf by leaf.

1. *Of their Woven Articles (or Garments).*—I do not intend to say much of them in this paper. Many of them are well known, and still to be found in use among the Maoris, but their manufacture has for many years sadly deteriorated: indeed, I have not seen a newly-made first-quality clothing-mat for the last twenty to thirty years, and I very much doubt if such can now be made at all. Not that the art of weaving them has been entirely lost, but the requisite taste, skill, and patience in seeking and carefully preparing and using the several parts (including their dyes) are no longer to be found among the Maoris. I sometimes indulge in a contemplating reminiscence—an idea—a pleasing reverie of the long past—of great gatherings of Maoris, tribes and chiefs; and at such times the figures of some head men I have known, clothed in their handsome, clean, and lustrous dress-mats (*kaitaka* and *aronui*), would stand forth in pleasing high relief. The close and regular weaving of such flax dresses, having their silky threads carefully selected as to fineness and uniformity of colour, and their smooth, almost satiny appearance, as if ironed or calendered when worn new, was to me a matter of great satisfaction—a thing to be remembered—"a joy for ever."

Those best dress-mats were always highly prized, both by Maoris and Europeans, and brought a high price. I well recollect a young lady, daughter of very respectable early English settlers in the Bay of Islands, who, when she came across the inner harbour in a boat with her parents to attend the English Church service on Sunday mornings in the Mission chapel at Paihia, often wore one of them folded as a shawl, and to me it seemed a neat and graceful article of dress.

Three things more in connection with these fine mats I will just relate: one, the cross-threads in weaving were always of a

be found here in New Zealand, is also used on the Continent of Europe for similar purposes. In some parts of Germany it is dedicated to the Virgin Mary (hence, too, its generic name of *Hierochloa* = sacred grass), and is strewed before the doors of the churches on festival days, as the *sweet sedge* (*Acorus calamus*) is strewed on the floor of the cathedral at Norwich for the same purpose at such seasons.

<sup>1</sup> Sir James Hector, in his book on the *Phormium* plants, enumerates fifty-five named varieties; but it is doubtful whether more than half of that number are permanent ones.

different sort of flax—the weft and the woof of these mats were not both taken from the same kind of flax; the second, that extremely soft lustrous appearance was given to the flax-fibres by repeated tawing done at different times—it was a pretty sight to see the various skeins of flax-fibres in their several stages of preparation neatly hung up in the weaving-shed; the third, that in the weaving of one of these garments, if a thread showed itself of a different shade of colour, that part of the garment was carefully unravelled to take it out, and to substitute another better suited in its stead. It was also from this superior knowledge and close attention to their work that the principal chiefs frequently took women who were clever at making those things to be their wives, in order to secure to themselves their valued manufactures.

They also wove very good and useful floor and bed-mats of unscraped flax-leaves, split into narrow lengths and carefully bleached in the sun—these were very strong and lasting; also baskets and kits of all sizes. Some of them were woven in regular patterns with black (dyed) and uncoloured flax; others were skilfully and pleasingly semi-damasked (if I may so term it) by changing sides to the flax-leaves used to form the pattern, the upper side of the leaf being smooth and shining, the under side not shining and of a glaucous colour. The little kit, or basket, for a first-born child was often a little gem of weaving art, and made by the mother.

Besides the flax plant they had other fibrous plants whose leaves and fibres were also used in making articles of dress: (1) the *totii* (*Cordyline indivisa*), of which they made black everlasting wraps or cloaks. The making of these was confined to the natives of the mountainous interior, where alone those plants grow. (2) The long orange-coloured leaves of the *pingao* (*Desmoschanius spiralis*), a prostrate spreading sea-side plant, also afforded them good materials for weaving useful folded belts, which were strong and looked and wore well, and were highly valued. (3) The climbing *kiekie* (*Freycinetia banksii*) was also used; likewise the long, slender, and soft leaves of the *kahakaha* (*Astelia banksii*), but not frequently. (4) Of the leaves of the common swamp plant *rauipo* = bulrush (*Typha angustifolia*), they formed large sails for their canoes. These leaves the Maoris curiously laced together. (5) I should not omit to mention their flying kites (*pakaukau* and *manuauite*), formerly in great esteem among them, and made of the manufactured bark of the *aute* shrub = paper mulberry (*Broussonetia papyrifera*), which was formerly cultivated by the ancient Maoris for its bark. Inferior ones, however, were made of the prepared leaves of some of the larger sedges. They were prettily made, requiring both time and skill in their construction, and much more resembled a bird flying than our English ones. They always served to remind me of those of the Chinese, as we see them in their own drawings and on their chinaware. The old chiefs would sometimes quietly spend hours amusing themselves in flying them and singing (*sotto voce*) the kite's song, using a very long string.<sup>1</sup> Kites being flown at any village or fort was a sure sign of peace. These, too, gave rise to proverbs, some being quaint and highly expressive. A pleasing one I give as a sample: "*He manuauite e taetae te whakakahoro*" = A flying kite made of paper-mulberry bark can be made to fly fast (away, by lengthening the cord). Used by a lover, expressive of impatience at not being able to get away to see the beloved one.

2. *Of their Spun Fibrous Articles.*—These were very numerous in kind, size, and quality, according to the particular use for which they were required; and, while the larger number of them were composed of scraped and prepared flax-fibres there were also other fibrous-leaved plants used by the Maoris, particularly the leaves of the erect cabbage-tree = *tii* (*Cordyline australis*) and of the *kiekie*, already mentioned. Here, too, in this department, the different kinds of varieties of the flax would be used for making the different sorts of threads, cords, and ropes, some of the varieties of flax enduring much greater strain when scraped and spun into lines than others; and of such their deep-sea fishing-lines were made. It was ever to me an interesting sight to see an old chief diligently spinning such lines and cords—always done by hand, and on his bare thigh. The dexterity and rapidity with which he produced his long hanks and coils of twine and cord, keeping them regular, too, as to thickness, was truly wonderful. Some of their smallest twisted cords or threads were very fine. Such were used for binding on the barbs to their fishing-hooks, and for binding the long queues of

<sup>1</sup> See an interesting historical tradition respecting such (Trans. N.Z. Inst., vol. xiii., p. 43).

dog's hair to their chiefs' staffs. One of those peculiar cords was a very remarkable one; it was a small cord, bound closely round throughout its whole length with a much smaller one (something like the silver or fourth string of a violin). I never saw this kind but once, and that was at the East Cape, in 1838. A specimen of it I shall now exhibit. This cord was used for a single and particular purpose, attached to the small under-aprons of girls—chiefs' daughters.

Their larger cords and ropes were composed of several strands, well twisted and put together. Besides their round ropes so made, they had also flat ones of various widths, which were plaited or woven, resembling our webs and bands, and much used as shoulder-straps in carrying back-loads; also double-twisted ropes, and three-strand ones; likewise a remarkably strong one that was four-sided. This was made of the unscraped leaves of the cabbage-tree, that had been gathered, and carefully wilted in the shade, and then soaked in water to make them pliant. It was used for their anchors, and other heavy canoe and house requirements. The leaves of the flax would not be suitable for this purpose. I have had all those different kinds of cords and ropes made for me in former years, but I much fear the art of making them is lost.

There were also their nets for catching fish and for other purposes, with their meshes of various dimensions. Their smaller caes (hand nets) were made of all manner of shapes and sizes. Some of them were dexterously stretched over circular skeleton framework. And their large seine-nets, used for catching mackerel and other summer fish that swam in shoals, were very long and very strong, made of the leaves of flax, split and prepared, but not scraped, and completely fitted up with floats, and sinkers, and ropes, and other needful appurtenances. Cook, who was astonished at their length, has written much in praise of them. I make one striking quotation: "When we showed the natives our seine, which is such as the King's ships are generally furnished with, they laughed at it, and in triumph produced their own, which was indeed of an enormous size, and made of a kind of grass [*Phormium*] which is very strong. It was five fathoms deep, and by the room it took up could not be less than three or four hundred fathoms long."<sup>1</sup> (Voyages, vol. ii., first voyage, pp. 369, 370.)

In residing at Dannevirke, in the Forty-mile Bush district, during several months, I have often noticed the Maoris from neighbouring villages coming to the stores there to purchase tether and other ropes and lines (large and small) for their use with their horses, ploughs, carts, pigs, &c., while on their own lands and close to them the flax plants grew in abundance. These Maoris had very little to occupy their time, and could easily have made common lines and ropes for their own use if they knew how to spin them as their fathers did, and also possessed their forefathers' love of work.

### UGANDA.

AT a special meeting of the Royal Geographical Society on the evening of November 3, Captain F. D. Lugard gave an account of the geographical aspects of his work in Uganda. The hall of the University of London was crowded, and although the issue of extra tickets was suspended, a large number of Fellows and their friends failed to get admittance. An excellent hand-map, by Mr. Ravenstein, enabled the audience to follow Captain Lugard's route. The first part of the paper was concerned with the journey from Mombasa along the Sabakhi river, an unnavigable stream, to Machako, the furthest station of the I. B. E. A. Company at that time, the district passed through being almost uninhabited, and supplies difficult to procure. The greater part of the paper related to Uganda and the other countries surrounding the Victoria Nyanza, where Captain Lugard was in command for two years. On the Kavirondo plateau, east of the lake, there is a promising field for European colonization. The plateau is crossed by the Equator, but at elevations of from 7000 to 8000 feet the climate is cool and exhilarating. It is possible, judging from experience in other

<sup>1</sup> An interesting historical tragic story of the cleverly-planned taking and death of a large number of Maoris in one of these seine-nets, together with the fish (illustrating what Cook has written of their immense size), and of the deadly warfare that followed, is given in the Transactions N.Z. Institute vol. xiii., p. 43.

places, that highlands close to the Equator are healthier for Europeans than those of similar mean climate lying nearer the tropics. Kavirondo is admirably adapted for grazing, and ranches similar to those of the west of America might be tried. From the pasture lands of this plateau the transition to the rich plantations of bananas and casava of Usoga and Uganda is very marked, and the unclothed natives of Kavirondo give place to the comfortably-dressed Waganda, a warlike people, but skilful in all the arts of peace.

Uganda is a land of low hills and valleys. The hills are of red marl, or marl-gravel, and shale, generally covered with pasture grass of a kind apparently peculiar to these countries. The valleys are generally of rich black soil, and most frequently the lowest part of the dip is a river swamp. The swamp varies from a few score of yards to a mile or more in breadth, usually being from half to three-quarters of a mile. There is a slight trickling current—but very slight; the river is choked with dense papyrus, with an undergrowth of marsh ferns, grass, reeds, &c. The water is usually the colour of coffee, and red with iron rust. Most of these swamps are of treacherous quagmire without bottom; and unless the roots of the papyrus form a sufficient foothold it is necessary to cut down reeds and boughs of trees to effect a crossing. It is a singular characteristic of these countries that, spite of their altitude and hilly character, rushing water is rarely, almost never, to be seen. Thus Uganda has a mean elevation of some 4200 feet, and borders the trough of the Victoria Nyanza at 3700 feet only, and is a country full of hills and valleys. Kitagwenda, at about the same altitude, borders the Albert Edward Lake at 3300 feet. Unyoro, with more lofty hills and peaks of granite, with an altitude gradually increasing in the south, as you near the Albert Lake, to some 5300 feet, similarly borders the trough of the Albert, which has an elevation of only 2000 feet. Yet nowhere are these river swamps more frequent than here in South Unyoro at the highest altitudes. The origin of the water to supply the enormous Lake Victoria is an interesting problem. Throughout the British sphere, on the north and west of the lake, there is no single river, except the Nzoia, which is worthy of the name flowing into the Victoria. The Katonga—marked on the maps as a big river—is merely a broad papyrus swamp. It is by no means so important a drainage as the Marengo; and all the endless river-swamps (including the Marengo) send their sluggish streams northwards to the Kafur and the Somerset Nile. The superficial area of the Victoria being 27,000 square miles, crossed by the Equator, and at an altitude of about 3800 feet, an enormous amount of evaporation must occur, and yet spite of this evaporation, there issues from its north-western corner the magnificent Somerset Nile, a deep, broad, silent river.

The close of the year 1891 and the early part of 1892 were exceptional in the matter of rainfall. Usually in this part of Africa the lesser rains begin early in October and cease in the middle of December. From that time the heat and drought increase, and the grass dries up and is burnt, till in the beginning of March the greater rains set in, and a tropical downpour continues with few breaks till the end of May. Last October and November the lesser rains were unusually heavy, and continued with little intermission till the time of the regular rains in March. There was a little check, and then the rain continued up to the middle of June and later. The result was, that the Lake Victoria was some six feet perhaps above its ordinary level, and may probably rise still higher. Unusual floods occurred in the Nile in Egypt during September, this not being the time at which the usual high Nile due to the Abaras floods occurs.

Uganda is divided into ten provinces, and the ten chiefs who rule these districts entirely drop their personal names, and are called by the traditional title attached to those provinces. Of these the four largest and most important have separate titles. Thus, the chief of Chagwe is the Sekibobo; of Singo, the Mukwenda; of Buddu, the Pokino; and of Bulamwezi, the Kangao. The remaining six are called by the title of their province, viz. Kitunzi, Katambala, Kasuju, Mugema, Kago, and Kaima. Superior in rank to these ten governors of provinces are the Katikiro (the vizier and chief magistrate of Uganda), and the Kimbugwe. These two hold innumerable estates, scattered throughout the country.

In June, 1891, Captain Lugard left Uganda with the object of coming in touch with the Soudanese refugees from the Equatorial Province, who had assembled at Kavalli's, on the south-