

population, but that they also discovered kitchen middens, with Moa-bone and flint tools. If these traditions can be relied upon, it shows at any rate that the black race, before the arrival of their successors, had been hunting and probably extirpating the Moa.

So, when relating the tradition of Manaia, Taylor quotes from Sir George Grey:—"When he arrived at Rotuhu, at the mouth of the river Waitara, he stopped there, and behold, there were people, even the ancient inhabitants of the island, but Manaia and his followers slew them. They were killed, and Manaia possessed their abode, he, his sons and his people, of those men that Manaia and his followers slew, that the place might be theirs." According to Taylor, the same is recorded of Turi, who "went on shore and dwelt at Patea and slew the inhabitants thereof" (page 14).

This aboriginal race was remembered as the Maero and Mohoao, or wild men of the woods (page 15). Enumerating on page 290 the arrival of the original canoes in New Zealand, he adds a footnote to No. 12, Te Rangi ua mutu, which came to Rangatapu: "On their arrival at that place, they saw stones like English flints and Moa-bones. It is there I also discovered a large quantity of the bones of the *Dinornis*. The stones were the stone flakes used as knives, which are still there found by the side of the ancient ovens, a proof of their having belonged to a more ancient race than the Polynesian."

In any case, we have to expand our conceptions considerably as to the time past, when first the original inhabitants, may they have been black or brown, trod the soil of these beautiful islands, in a period dating back long before the so-called emigration from Hawaiki took place.

---

ART. IV.—*Notes on the Moa-hunter Encampment at Shag Point, Otago.* By  
JULIUS HAAST, Ph.D., F.R.S., Director of the Canterbury Museum.

Plate III.

[*Read before the Philosophical Institute of Canterbury, 23rd December, 1874.*]

MR. F. D. RICH, of Bushy Park, whom I had the pleasure to meet in the middle of April, 1872, in Palmerston, when I was just on the point of returning from the geological survey of the Shag Point coalfield to Christchurch, informed me that on the sandspit running from southern banks of the Shag River, nearly across the mouth of that valley, and by which the stream is confined to a narrow channel close to the northern bank, extensive kitchen middens with Moa-bones were to be found, which appeared to him of considerable interest. As I had already made my arrangements for returning

immediately, I could not stay to visit the locality at that time, but I instructed the servant I had with me, before returning to Christchurch with the horses, to go there in order to collect a number of specimens.

They consisted of Moa-bones partly broken, mostly belonging to *Palapteryx* and *Euryapteryx*, and a number of chipped flint implements of the same character as those collected during my examinations of the Moa-hunter encampment near the mouth of the Rakaia, and I had no doubt that a careful survey of that locality would yield most important information upon the manner and period of extinction of our former gigantic avifauna.

I therefore at the end of November of this year, during a stay at the Waitaki, paid a visit to Shag Point, when, with the assistance of men and tools, kindly furnished by Mr. Rich, I was enabled to make such excavations that a thorough insight into the whole of the beds could be obtained. My best thanks are due to Mr. F. D. Rich, on whose property these extensive deposits of human origin are situated, for his permission to examine the same, as well as for the ready assistance afforded me.

{ The valley of the Shag River, which for the last four or five miles has nearly a due west to east direction, is, on the average, half a mile broad, being bounded on both sides by steep banks. The currents of the sea travelling from the south to the north have thrown across the valley at its mouth a spit consisting of marine sands in its lower, and of blown sands in its higher portion. These deposits, about 60 feet high at the commencement of the spit, where they repose against the rocks forming the southern banks of the river, gradually decrease in altitude until, near their northern termination, they are overflowed by the tides, the river channel proper running here along the northern rocky banks. Inside this spit a small estuary is formed, stretching several miles up the river, and which forms here an impassable barrier to animals wishing to cross to the other side. It is evident, as the country consists on the southern banks of low rolling downs with rich soil, that they must have offered a fine feeding ground to the Moas in past ages, and at the same time a remarkably favourable hunting field to the aborigines, who, without doubt, driving them towards the apex of the deltoid space formed by the sea coast and the southern banks of the Shag River, slaughtered the huge birds wholesale on and near the spit, afterwards holding there their feasts; and, as I shall show further on, having such an enormous amount of game, they used only the main portion of each carcass for their meals.

The spit, as before observed, highest at its southern end where it joins the downs, is here about 200 yards broad, gradually narrowing to about 50 yards where the vegetation ceases, and the waves of the sea overflow it occasionally.

Both Moa-hunter and Maori ovens and kitchen middens are scattered all over the spit; the former are only visible when the sands have been blown away, or the sea has washed into the beds above them, but both being—as on the sand hills, near the Moa-bone Point Cave—in several spots mixed together in a remarkable manner. Generally, however, they are very distinct, and show clearly that a considerable period of time must have passed away before the Maoris, after the disappearance of the Moa-hunters, took again possession of that locality. This is made still more striking by the discovery of the curious fact that the Maori or shell-beds are never found at a lower level than about 2 feet above high-water mark, while the Moa-hunter beds, as far as I could ascertain, actually occur in some of the back waters of the estuary, 2 feet below high-water mark, thus showing conclusively, that since the Moa-hunters had ceased their work of destruction, and before the shell-fish eaters had reoccupied the ground, the country had been sinking considerably. And if we admit that the former would not have dug their ovens in wet ground, and thus would have kept the bottom of their ovens at least a foot or so above high-water mark, we cannot escape admitting the inference that the country between the occupation of both populations has been sinking about 3 feet.

The annexed sections (Pl. III.) will demonstrate this more fully. Near the southern side, the sandspit is formed into several small hillocks, which, where the Moa-hunter kitchen middens are exposed, show under a capping of 3 to 4 feet of blown sands with sometimes a small layer of vegetable soil on the top, several beds of ashes, often separated by 9 to 15 inches of drift-sands. Each ash-bed is generally continuous, and 3 to 6 inches thick. The boulders, by which the huge cooking ovens of the Moa-hunters are formed, were generally situated below the ash-beds, whilst the remains of their meals are scattered most frequently all through them, as well as lying above and below them.

The succeeding shell-fish eating population generally had their camping grounds in the hollows between those hillocks, and, as is clearly discernible, frequently used the cooking stones of the Moa-hunter ovens, which had rolled down the sides from the beds higher up, being gradually destroyed by wind and weather. There are even a few localities where a talus, formed of sands and the remnants of the Moa-hunter feasts, actually covers the younger shell-beds, and of which I give an instance in section No. 3 (Pl. III.). However, when we descend to lower ground we soon observe still more distinctly the great difference between both deposits as to their position; this is principally clearly brought to view when the sand-banks abut against the estuary, and the river has cut into them. Here the shell-beds are exposed in low vertical banks, but never descending lower than 2 feet above high-water mark.

They contain mostly remains of mollusks, *Mytilus*, *Haliotis*, *Chione*, *Mesodesma*, *Lutraria*, and several others, together with fish and dog-bones; small pieces of obsidian are also embedded amongst them.

In their vicinity, and below high-water mark, a small flat stretches towards the river channel, which is in many localities literally paved with Moa-bones. The excavations which we undertook on this piece of ground proved that the lowest bed of human origin, consisting of boulders, once forming the cooking ovens, had been arranged at least 2 feet below the surface of the flat. Here and there a chipped stone implement embedded amongst the bones, and of exactly the same character, proved that the same people who feasted on and near the summit of the sand-hills, camped here on the flat, which must then have been high and dry, and, as before observed, situated about 3 feet above high-water mark, as the fires with which the Moa-hunters heated their boulders at the bottom of these ovens could not otherwise have burnt.

As the time at my disposal would not allow me to make a thorough investigation of the whole station, I selected some of the principal spots from 50 feet high downwards to the flat below high-water mark, in which, over a small area, the contents of the kitchen middens were carefully examined by me. The results were very gratifying, as not only did I thus gain a good insight into the life of the Moa-hunting population in that part of New Zealand, but I obtained also some exceedingly valuable portions of Moa skeletons, amongst others several complete skulls with upper and lower mandibles and tympanic bones, a few of which at the time had still the atlas, epistropheus, and some of the uppermost cervical vertebræ in their proper position.

It appears from the specimens collected, that the Moa-hunters of the Shag Valley must have had such abundance of game that they selected for their food only the most valued portions of the birds killed.

The principal species occurring here are *Palapteryx crassus*, *Euryapteryx rheides*, and, in a minor degree, *Euryapteryx gravis*, and *Palapteryx elephantopus*, other *Dinornis* species being only represented by a few bones of *D. robustus*, and some of the smaller kinds. Of the small *Meionornis* species, *casuarinus* and *didiformis*, only a few remnants were found. It thus appears that these latter were more confined to the open plains.

Unlike the leg bones in the other Moa-hunter encampments, which, with very few exceptions, were always broken for the extraction of the marrow, here only the tibia (long bone) had been subjected to such fractures, only a few of them being found entire. On the other hand, the greatest number of the femora and metatarsi were unbroken, the small quantity of marrow in them not having been thought of sufficient value to pay for the trouble of extraction.

I had been so accustomed to find in other localities the Moa skulls either in fragments, or at least broken in the occipital region, for obtaining the brains, that I was not a little astonished to excavate all the skulls in a perfect state, and, as the position of the vertebræ and of the tracheal rings lying along them proved, the whole portion of the upper neck had been thrown away, as not of sufficient value. It thus is evident that in most cases only the body served for food, and as some shallow broad cuts or scratches in one fragmentary pelvis and in some femora demonstrated, the same had been operated upon with rough stone knives; some of the intercostals had also been cut or sawn through in the same manner. This intactness of the Moa-skulls might also suggest to us that the Moa-hunters were in the habit of killing their prey either by snaring them, by catching them in pits, or by wounding them with spears in the body. Had they used wooden clubs, they would certainly have broken the skulls as the easiest means of securing their prey, just as we find nearly every seal skull broken from a similar reason.

Before leaving this subject, I may observe that not a single specimen—either entire or fragmentary—of the scapulo-coracoid, or wing-bone, of the Moa was obtained, while a considerable number of the intercostals and portions of sternums with them were excavated. It is a curious coincidence that thus we should have the sternal apparatus of numerous specimens and belonging to several species preserved (which according to my showing did not possess a scapulo-coracoid) without finding the slightest trace of that bone, and I may claim this striking absence from the kitchen middens as a further confirmation of my views.

Besides the different species of *Dinornithidæ* as enumerated above, the ovens contained numerous remains of several species of fur seals, of which the small *Gypsophoca subtropicalis* was most abundant; the sea-leopard (*Stenorrhynchus leptonyx*) was also represented. There were also a few bones of a small whale, probably *Euphysetes*, and the ear-bone of a larger ziphioid whale, so that also in this respect these kitchen middens resembled those of the Moa-hunters in and near the Sumner Cave. Human bones were not met with in either of the deposits of human origin at Shag Point. Amongst the whole mass of bones in the older kitchen middens, I failed to find any belonging to the dog, which thus may have been either not of frequent occurrence or was not much valued, the Moa-hunters having probably such a great number of large birds at their command, that, with the exception of the oily seal flesh, they did not much care for other food.

As previously observed, a number of chipped flint implements were collected amongst the kitchen middens of the Moa-hunters, several of which, by their well-finished form, evinced considerable skill in the manufacture; they

are nearly all made from a yellowish mottled flint, which, as I have been informed, occurs some considerable distance inland. The largest specimen is 8 inches long and 3 inches broad, flat on one side, as most of them are. After the lengthwise fracture, doubtless by one blow for each surface, a number of smaller blows were given, in order to form as many indentations upon the edge, by which the tool was converted into a kind of saw. This implement, like several others of a smaller size, but of the same type, was most probably used to cut or saw through the sinews, or other tough portions of the birds or seals. Others have the form of knives and scrapers, and others resemble spear heads. The specimens from the sands and ashes taken above high-water mark have a remarkably fresh appearance, while those lying in the deposits below high-water mark have a thick coating of patina, or, better stated, are eaten into considerably by the effects of the brackish water.

Of those remarkable primitive stone knives, broken off from a boulder by a single blow, and which are so very numerous in the Rakaia encampment, I obtained only two.

They consist of a fine-grained basaltic rock, and were evidently broken from a large boulder.

I may here mention, that in looking through the fine and interesting volume of the "United States Geological Survey of 1872," published by Dr. Hayden, I was very much struck with the following passage, page 653, in the article "On Remains of Primitive Art in the Bridger Basin of Southern Wyoming," by Professor Jos. Leidy. "I may take the opportunity of speaking of a stone implement of the Shoshone Indians, of so simple a character that had I not observed it in actual use, and had noticed it amongst the material of the buttes, I should have viewed it as an accidental spawl. It consists of a thin segment of a quartzite boulder, made by striking the stone with a smart blow. The implement is circular or oval with a sharp edge, convex on one side, and flat on the other. It is called a 'teshoa,' and is employed as a scraper in dressing buffalo skins. By accident, I learned that the implement is not only modern, as I obtained one of the same character, together with some perforated tusks of the elk, from an old Indian grave, which had been made on the upper end of a butte, and had become exposed by the gradual wearing away of the latter."

The figure of this "teshoa," a name which I wish to adopt for similar stone implements in New Zealand, is so like one of the latter that it would be impossible to distinguish them if placed side by side. At the same time, I wish to observe that the description and figures of the flint-flakes, roughly chipped, found in Indian graves, etc., are so much like those obtained in the Moa-hunter encampments that there is no doubt that the former aborigines of New Zealand

employed the same mode of manufacture and used the same form of rude stone implements as the primitive races of Europe and North America.

No polished stone implements of any kind came into my possession during the search made, except a few pieces of yellowish sandstone, of which one had a carefully polished cutting edge along one side, and another piece had a groove as if it had been used for polishing purposes. However, as these pieces were lying on the surface, there is no certainty as to their real age.

#### *Conclusions.*

It will be seen from these short notes that the observations made by me in the Province of Canterbury, as to the age and position of the kitchen middens in which the remains of the Moa are to be found, have been fully confirmed by the examination of similar beds at Shag Point, about 200 miles distant. We have always been told that the southern portion of this island must have afforded a shelter to the Moa to a recent date, but the evidence offered by the facts brought to light during these excavations strongly proves the contrary. I may be answered that the Moa may have outlived the Moa-hunters, and we are triumphantly told about Moa-bones with skin and ligaments, even recently found, but I wish to point to the facts brought forward in my paper on the same subject in Vol. IV., "Transactions, New Zealand Institute," in which I have, and I trust conclusively, shown that there are exceptional causes to which this remarkable preservation is due. When the bones of *Megalonyx jeffersoni* were found in the Mississippi Valley, which had the cartilages still adhering to them (see "*Lethæa geognostica Bronn*," Vol. III., page 1,010), nobody argued from this unusual occurrence that this gigantic sloth had only been extinct for a short time; and, in fact, the very position of the different specimens of the *Dinornithidæ* found in Otago (the Tiger-hill skeleton, feathers in another locality, and the neck, etc., in the Earnsclough Cave), proves that they all owed their—sometimes only partial—preservation to peculiarly favourable circumstances, easily to be accounted for.\*

The change of level between land and sea which took place after the kitchen middens of the Moa-hunter had been formed, and before the shell-fish eating population had visited the same locality, is a further strong evidence that a portion of the Southern Island underwent some physical changes after the time when the Moa became extinct, at least in that part of the country. I have, of

---

\* That organic bodies can be preserved for a considerable time is sufficiently proved by the human bodies excavated in the last few years from the peat deposits of Northern Germany. They are said to be "mummies in a marvellously preserved condition," and of which skin, hair, and tendons have been best preserved. Bronze ornaments and seven glass beads were found with one, Roman coins belonging to the time of Septimus Severus (194 A.D.) and iron weapons with two others. See "*Moorleichenfunde in Schleswig-Holstein*." Von Heinrich Handelmann and Ad. Pansch (Kiel; Schweser), and of which an interesting notice appears in the "Academy," 19th September. 1874.

course, no means of judging of the age of the kitchen middens of the shell-fish eaters, but it is evident that they are not of recent origin, if we take their position and contents into account. In fact, I believe them to be the equivalents of similar beds near the Sumner Cave, and which the natives themselves assign to the Waitaha, the remotest Maori occupation. On geological evidence alone the kitchen middens of the Moa-hunting population at Shag Point must therefore be pronounced to be of considerable antiquity.

---

ART. V.—*On the Identity of the Moa-hunters with the present Maori Race.*  
By ALEXANDER MCKAY, of the Geological Survey Department.

[*Read before the Wellington Philosophical Society, 8th August, 1874.*]

DURING the spring of 1872, under the direction of Dr. Haast, of Christchurch, I excavated what is known as Moa-bone Cave, which is situated about seven miles from Christchurch, on the Christchurch and Sumner Road; the object of the excavation being to procure further information relative to the association of Moa-bones with the remains of the former human inhabitants of the cave. On the completion of the work I supplied Dr. Haast with a report embodying the main facts collected during the progress of the excavation, together with ample collections of the various relics found. My present paper is but an amplification of the report mentioned, with the addition of my own views respecting the matter at issue, viz.:—Whether the Moa-hunters were possessed of tools other than those of the rudest description; and whether this constituted a distinction between them and the Maori inhabitants of later times?

With these objects in view work was commenced on 3rd October, and was continued for the following seven weeks, during which period the entire cave and a considerable area outside was turned over.

The cave is situated in a low spur of the volcanic range just opposite the junction of the Avon and Heathcote rivers, the mouth of the cave looking north-west, and facing the estuary of the two rivers. The cave itself results from the excavation by the sea of an old soil and other loose material between the two compact streams of lava rock, and it consists of three separate chambers in a nearly straight line from the entrance.

The outer cave is by far the largest. It measures 100 feet in length, 74 feet at its greatest width, and varies in height from 12 to 25 feet. The walls are for the most part nearly vertical, the roof jagged and uneven, as its varying