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Art. L.—On the Working of Greenstone or Nephrite by the Maoris.

By F. R. Chapman.

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Nearly ten years ago Professor Ulrich, of the Otago University, handed me a letter which he had received from Professor Fischer, of Freiburg, in the Grand Duchy of Baden, the great authority on nephrite, making a series of inquiries on the subject of the Maori lore concerning this mineral and its uses. Professor Fischer is the author of a treatise or monograph on nephrite,—which, however, I have never been able to see,—and of several, probably numerous, scientific papers on the same subject. Professor Ulrich asked me to endeavour to answer the questions in so far as they related to Maori lore; but, as learned Maoris are rarer than black swans in the South Island of New Zealand, and as the North Island is a long way off and I have few opportunities of going there, I set to work to turn Professor Fischer's questions into English, add a few to them, and get them printed for circulation. Through the kindness of Mr. Hanson Turton, a Maori scholar, holding the office of Native Commissioner here, I obtained the names of many suitable men in the North, but I am sorry to say that the long printed paper which I sent out only came back four or five times with answers. I believe, however, that the answers which I did get give pretty nearly all that is to be learned on the subject of most of the questions; and some of the matter is undoubtedly of the very highest authority: but for satisfactory answers to Question No. 16, as to the customs, superstitions, traditions, and other lore concerning greenstone, further inquiries will have to be made in the North Island.

I sent copies of the answers to Professor Ulrich from time to time as I received them, and with them I wrote him several letters, of which I retained no copies, and in which I gave him the result of inquiries I had made on a flying visit to the North Island, and of some observations of my own. In the course of time I received from Professor Fischer a paper, which does not show in what scientific journal it has appeared, entitled “Ueber die Nephrit-industrie der Maoris in Neuseeland.” I was a little shocked to notice the number of errors to which my loosely-written letters had given birth. I found myself styled Professor Chapman—due probably to the circumstance that Professor Ulrich had referred to “my former colleague,”

in reference to the fact that I had once been a Law Lecturer at the University where he was Professor of Mineralogy. I found many slight mistranslations and misunderstandings; and when I submitted the whole thing to my friend Mr. Helms, of Greymouth (now, I think, of the Geological

Survey of New South Wales), he pointed out several more. Again, I found that, with all the care which I and those who answered my questions had used, some of the Maori names had gone wrong.

I have lately determined to republish the results of my inquiries in English, for the above and several other reasons. In the first place, Professor Fischer's paper seems to have come out before he received the last instalment of matter—namely, a set of answers by the late Mr. John White, our leading popular Maori scholar, and those of Dr. Shortland, our most learned and philosophical writer on Maori matters. Now Mr. White has died, leaving his magnum opus the "Ancient History of the Maori" incomplete, and I have reason to think that the paper he sent me embodies some of the matter of the History, which may otherwise never see light. Another reason for going into print is this: I am told that Professor Fischer's paper has been reproduced with additional information in an American scientific publication—I do not know which. Now, as a rule, whatever the Americans do they do well, and the additional information ought to be published in New Zealand; but I have too appreciative a recollection of Washington Irving's story of the Art of Book-making to allow me to care to contemplate my ill-considered, roughly-written private notes to Professor Ulrich first Germanised by Professor Fischer, and then Englished by some one else. The author of the paper I have heard of will not, I am sure, object to a revised version. The questions are included in this paper, and are followed by the correspondence answering them; to which I have ventured to add some notes and criticisms of my own, by way of clearing up certain matters inadequately expressed, and certain apparent contradictions. I hope my correspondents will accept these notes in the spirit in which they are offered. Having now been nineteen years in the field as a collector and observer, I have a fair claim to be allowed a part in the discussion.

In the title of this paper the word "greenstone" occurs, and this word is used throughout the text. I am quite conscious that the term is not geologically or mineralogically correct; but the stone of which I am writing is known by that name throughout New Zealand, and, though here as elsewhere the scientific man employs that word to describe a totally different class of rock, I should run the risk of being misunderstood were I to use any other word for what is under

that name an article of commerce and manufacture in New Zealand. It is called pounamu or poenamu by the Maoris, and "jade," "jadeite," or "nephrite" by various writers, while old books refer to the "green talc" of the Maoris.

Too little has been said and too little is known of the way in which stone implements were made and used; and the reason is this: When the savage acquires an axe of steel his beautiful but ineffective stone weapon becomes useless, and falls from his hand. The rude whaler, who is his ideal white-man, looks curiously at the stone which yesterday served as a tool: but there the matter ends; and by the time a man who not only feels a little curiosity on the subject but desires to impart a little information to his curious countrymen dwelling in the remote Old World comes round, the savage and his savage children have gone to shadow-land; and the white-haired old whaler who witnessed

the change points to the sandhills, which he calls Measly Beach, as the landmark between the two races, and shows where all his old acquaintances are buried. “Yes, Jacky Jack used a stone hatchet; have seen him make one.” But it is too much to expect the old man to describe how this was done; it happened fifty years ago. Even Mr. Wohlers, an intelligent missionary, whose letter I publish, picked up some erroneous notions in the early whaling days; but fortunately my communication was in time to induce the Rev. J. W. Stack, whose knowledge of Maori affairs and Maori ways is unsurpassed, to draw his information directly from the pure and undefiled well of surviving ancient cannibalism, and was also in time to secure answers from such men as Mr. John White and Dr. Shortland, each of whom had half a century's experience of the Maoris to draw upon.

With the exception of the tangi-wai, the various kinds of greenstone are all found in a restricted locality on the west coast of the South Island. The Taramakau River is one of the numerous rivers flowing from the main range to the sea on that coast. Like the others of that region, it is in size out of all proportion to the country which produces it: this is owing to the great rainfall. This river, at the mouth of which Brunner and Heaphy found a village in which greenstone was worked in 1846, coupled with the Arahura and the sea-beach between and about the two, is in all probability the Waipounamu (Water of Pounamu) of the Maoris, which has given its name to this great island. The name “Arahura” is more often mentioned in the traditional history of greenstone. It is a much smaller stream, nine miles south of the Taramakau. The next river is the Hokitika, a little farther south, where the chief town of Westland stands, in the bed of which, however, greenstone is not found. The word “Hokitika” means

in Maori “Return direct.” Its course is the nearest road, via Browning's Pass, to the east coast, and it plays an important part in the history of the subject.

It must be remembered that on the West Coast shingly river-beds are highways. In the primitive times the dense forest between them was almost trackless. The greenstone is found in boulders in the deposits of gravel in the two valleys referred to; and these boulders are also cast up on the beach by the waves, having been formerly carried into the sea by the rivers. I do not know whether the dyke, or vein, has ever been found. In the early days the stone was rare and expensive. Litigation about the ownership of a block reached the Court of Appeal—an expensive matter in those days—and disclosed the fact that the stone had a high pecuniary value. It is now very cheap, as it is washed out of the great gravel-beds in the valley of the Taramakau in the process of sluicing for gold, and the gold-miners sell it to the storekeepers at a very moderate rate. Picked stone is only worth 1s. per pound, but exceptionally fair pieces command a higher price. A great deal is now thrown away owing to the want of a regular market. It is not easy even now, however, to get a perfect piece of large size. When Professor Ulrich and I, at the request of the Germans of Melbourne, chose the piece for a presentation paper-weight for Prince Bismarck, we had a difficulty in getting a perfect piece of the best quality as large as an octavo volume, though we had some tons of stone to choose from. The kind of stone known as tangiwai (tear-water) is very inferior, and is easily scratched with a knife; but it is sometimes very beautiful. It is found at Piopiotahi, or Milford Sound, and perhaps at other

places. It is sometimes taken in slabs off serpentine boulders, and may be obtained on the beach at Anita Bay, near the mouth of the sound. Damour, of Lyons, has analysed it, and finds that it is chemically quite a different stone from the pounamu.

Myths.

Cook, living in the days when mere myths were unvalued untruths, missed an opportunity. He thought, from the description of the Maoris, that the greenstone-country was near at hand to his winter-station at Queen Charlotte Sound, and regretted not being able to visit it, "as we were told a hundred fabulous stories about this stone, not one of which carried with it the least probability of truth, though some of their most sensible men would have us believe them. One of these stories is that this stone is originally a fish, which they strike with a gig in the water, tie a rope to it, drag it to the shore, to which they fasten it, and it afterwards becomes stone." This was too much for a North Country sailor in the

eighteenth century. Cook probably mistook the learning of the priests for a narrative of current events.

Pounamu was one of the sons of the great Polynesian deity Tangaroa (Lord of the Ocean), who was the son of Rangi (Heaven) and Papa (Earth). Tangaroa married Te Anu-matao (the Chilly Cold), who became the mother of four gods, all of the fish class, of whom Pounamu was one. The substance pounamu, it is said, was formerly supposed to be generated inside a fish (the shark), and only to become hard on exposure to the air.

Poutini was one of the brothers of Pounamu. He gives the name to the mythical stone brought by Ngahue to New Zealand commonly called in story the Fish of Ngahue (vide post). The stone pounamu was by learned Maoris classed with fish. The traditions respecting its discovery at Arahura state that Ngahue found it "in a lifeless state"—that is, unformed.

Tamatea-pokai-whenua, a celebrated ancestor of Maori tribes, in addition to his faithful wives, had three—Hinerau-kawa, Hinerauharaki, and Te Kohiwai—who deserted him. He sailed right round the South Island in search of them, naming the rivers and headlands as he passed. Though he listened for every sound indicative of their presence, it was not until, passing up the west coast, he reached the Arahura River that he heard their voices. He failed, however, to discover his wives, for he did not know that there canoe had been upset here, and they and all the crew had been transformed into stones. His slave, happening to burn his fingers while cooking some birds they had killed, impiously licked them, urged by the pain. He was instantly turned into the mountain Tumu-aki, which stands there still; and as a consequence Tamatea never found his wives. Since then the flaws which

sometimes discolour the best kinds of greenstone are called tutae-koka—the excrement of the birds the slave was cooking when he did this wrong.

Myths, Traditions, and History.

Several ancient Maori stories refer to dissensions which took place in Hawaiki before the great migration of the Maori people from that country to this. From them we learn something of the causes of the migration, and the mode in which it was designed and carried out. Later we learn from tradition, and finally from the history of this century, the part played by greenstone in the affairs of a nation whose history is war.

Legend of Poutini and Whaiapu.

The very discovery of New Zealand is connected with greenstone. Poutini and Whaiapu both rested in the same

place, and Hine-tu-a-hoanga (the Lady of the Rubber), to whom the stone Whaiapu belonged, became excessively enraged with Ngahue and with his stone Poutini. At last she drove Ngahue out of the place, and Ngahue departed to a strange land, taking his jade-stone, followed, however, by Hine-tu-a-hoanga. Ngahue arrived at Tuhua (Mayor Island, in the Bay of Plenty; it is the Island of Obsidian) with his stone; and Hine-tu-a-hoanga also landed there, and began to drive him away. Then Ngahue sought a place where his jade-stone might remain in peace, and he found in the sea this island Aotearoa (North Island), and contemplated landing there. Thinking he would there be too close to his enemy, and lest they should quarrel again, he left, carrying off his stone. So he carried it off with him, and they coasted along, and at length arrived at Arahura (on the west coast of the South Island), and he made there an everlasting resting-place for his jade-stone. Then he broke off a portion of his jade-stone, and with it returned; and as he coasted along he at length reached Wairere (believed to be on the east coast of the North Island), and he visited Wangaparoa and Tauranga, and returned thence direct to Hawaiki, and reported that he had discovered a new country which produced the moa and jade-stone in abundance. He now manufactured two sharp axes from his jade-stone, named Tutauru and Hauhau-te-rangi. He manufactured some portions of one piece into images for neck-ornaments (hei-tiki), and some portions into ear-ornaments. The name of one of these ear-ornaments was Kaukaumatua, which was recently in the possession of Te Heuheu, and was only lost in 1846, when he was killed with so many of his tribe by a landslip. [This has since been recovered.] The axe Tutauru was only lately lost by Purohokura and his brother Reretai, who were descended from Tama-ihu-toroa. When Ngahue, returning, arrived again at Hawaiki, he found them all engaged in war; and when they heard of his description of the beauty of this country of Aotea some of them determined to come here.

They then felled a totara-tree in Rorotonga, which lies on the other side of Hawaiki, that they might build the Arawa from it. The tree was felled, and thus the canoe was hewn out from it and finished.

The names of the men who built the canoe were Rata, Wahie-roa, Ngahue, Parata, and some other skilful men who helped to hew out the Arawa and to finish it. The Tainui was also built by Hotu-roa; also, other canoes—viz., Matatua, Takitumu, Kura-hau-po, Toko-maru, and Matawhaorua. These, the Maori historians say, are the names of the canoes in which their forefathers departed from Hawaiki and crossed to this Island. The axes with which their canoes were built were made from

the block of greenstone brought back by Ngahue to Hawaiki, which was called “the fish of Ngahue.”

The earlier part of this story is probably a myth. A contention arises between two precious stones. The Lady of the Stone-rubber harries the owner of Poutini, the precious greenstone, who, however, ends by establishing a new nation. It is, in effect, the same as Cain (the agriculturist) turning upon Abel (the pastoralist) and forming a stronger nation—a process which goes on actively in these colonies to this day. His name, “The Swarm,” does not appear to connect itself with the subject. Flying from Hawaiki, the land of shades or night, he first comes to Tuhua. This means “obsidian,” and is the name of an island in the Bay of Plenty—Mayor Island—where quantities of that stone are found. Disturbed there, he comes to Aotea, the Land of Bright Day. At Arahura, where he at last lands, he plants his stone, and so the story accounts for our now finding it there. He returns and tells of the new land of the moa and the jade-stone. The place “Wairere,” wherever it was, frequently occurs in Maori story in connection with the extremely vague traditions of the moa. The story may be a mythical version of the discovery by a real personage of the distant land; and it is possible that the bringing home of this rare stone may have occurred. The rest of the story is the well-known tradition of the migration to New Zealand, the true historical value of which has yet to be determined. The names of the canoes and their builders are good Maori names.

The foregoing is abbreviated from Sir George Grey's “Polynesian Mythology” and Maori legends. Another version discards the mythical cause of contention, but gives the story of the contention, and tells how Ngahue, taking up his abode at Arahura, found during his residence there a block of greenstone “in a lifeless state”—i.e., unworked—which he took back with him to Hawaiki, from which were made the axes used in building the Tainui and Arawa. An earring (tara pounamu) called Kaitangata (man-eater), also made from this block, was in the possession of the Ngatitoa for ages, and was by the famous chief Rangihaeata presented to Sir G. Grey in 1853. There are several versions of the story, generally agreeing, most of which refer to the eardrop as Kaukaumatua.*

[Footnote] *The various references to “Kaitangata” and “Kaukaumatua” in books are somewhat bewildering, and leave me uncertain as to whether they are the same ornament; if not, which of them was given to Sir G. Grey. Kaukaumatua frequently crops up in history and poetry. It was brought from New Zealand to Hawaiki; it became the property of Tamatekapua, who was a son or kinsman of Ngahue, and navigated the Arawa to New Zealand; it was buried by his son Tuporo, and recovered [Tregear]; it passed through the hands of many other celebrities, and is an important muniment of title.

Of this story it may be remarked that, though we have no means of determining its historical accuracy, it is, of course possible that preliminary exploring expeditions visited New Zealand and returned to the ancestral home, wherever that was, as we have evidence that, as a rule, the islands of the Pacific were discovered by regularly-equipped exploring expeditions. The report of the discovery of a great country, with no formidable inhabitants, arriving in an over-populated island the inhabitants of which were constantly at war with each other, is just the kind of circumstance that would stimulate a great migration, such as that which the traditions describe with such minute detail. The chief difficulty in this story and others relating instances of a return to Hawaiki lies in the degree of accuracy required to navigate a small vessel back to a very small island, while we know that for ages before Cook's time New-Zealanders had not made such voyages. It is, however, more than probable that the Maori navigators of ancient times possessed far superior knowledge and methods to those of Cook's time. Possession of a great territory had made them cease to be navigators of the ocean. The same thing had happened to our own race for two centuries at least before Alfred's time, and it is not difficult to point out that four or five times in history the possession of more than sufficient land-extension has caused the English or the Saxons to turn their faces from the sea.

Several traditions exist in New Zealand attached to particular implements or ornaments of greenstone besides the two mentioned, suggesting that they were brought from Hawaiki. Reference to one of these is made by Mr. Stack in his replies to my questions given later. I am informed by the Rev. Mr. Hammond, a missionary at Patea, that when the Maoris lose a treasured keepsake they make another like it, and always refer to the new one as if it were the identical original: in this way a paddle of one of the ancient canoes may be preserved in name. Possibly the precious Kaukaumatua may thus represent an ancient jewel of some other material.

Waitaha.

The history of the South Island (leaving out of consideration for the present its west coast, separated by an alpine barrier, and certain local settlements in the northern part of the Island) begins with the tribe called Waitaha. They came from the east coast of the North Island, and became extremely numerous; and to them are attributed by tradition the vast shell-heaps which lie near the beaches. They were exterminated by Ngatimamoe,—Mr. Stack thinks, three hundred years ago. They are vaguely connected by tradition

with the extinction of the moa; but this touches the controverted question as to the date of that extinction. I cannot find, however, that they are traditionally connected with greenstone.

Ngatimamoe.

This tribe conquered the above, and dominated this Island for about a century. They then became extinct as a tribe, but some hapus or sub-tribes incorporated with the conquering Ngaitahu still trace their blood to Ngatimamoe ancestry. It is a subject of reproach to have pakeha or European blood; and a half-caste lady once told me that, being thus reproached by relations, she replied that that was necessary to neutralise the bad strain of Ngatimamoe blood in our veins. The extent to which Ngatimamoe are traditionally connected with greenstone is discussed hereafter.

Ngaitahu Invasion of the South Island.

Mr. A. Mackay, Native Commissioner, who is well versed in South Island affairs, describing Nga-i-tahu, who were an emigrant offshoot from Ngati-kahu-ngunu, the tribe which occupies the east coast of the North Island south of Hawke's Bay, says the desire to possess themselves of the greenstone which was only to be found in the South Island is supposed to have been the chief inducement which urged large bodies of this tribe at different times to invade the country of the Nga-timamoe, who had become celebrated as possessing this treasure. The story of the introduction of the stone to the knowledge of Ngaitahu, however, contradicts this version, which is not accepted by Mr. Stack, and is doubted by Mr. Mackay himself. Ngatimamoe in all probability did not possess much greenstone, perhaps did not know it, for it was after Ngaitahu had acquired their knowledge, and fought for and conquered the West Coast, that they carried on their bloodthirsty war of extermination against Ngatimamoe, fighting over the district surrounding this city (Dunedin), and ultimately destroying them in Southland.

Geography of the West Coast.

It is necessary that I should endeavour to give a clear idea of the West Coast region and its approaches, in order that the events hereafter mentioned may be properly appreciated. That portion of the West Coast region which lies south of Martin's Bay may be disposed of at once. It can be entered by none but very high alpine passes, only recently discovered, and probably not used by Maoris. Its shores are so steep that there is no travelling along them. In its northern extremity, however, is Piopiotahi, so often mentioned as the place where

tangiwai is found, to which reference will be made hereafter. North of this lies the West Coast, so famous twenty-five years since for its enormous yield of gold, and still occupied by a population of twenty-five thousand energetic people devoted to mining pursuits. It maybe entered in several different ways, thus: (1.) By sea from north or south. No doubt at times the coast was visited by sea. Mr. Wohlers mentions this, though he apparently refers to Piopiotahi, not to Arahura. But the coast is fearfully exposed and the sea excessively rough, and boating even with powerful crews must have been highly dangerous. (2.) By land viâ Lake Wanaka, the Haast Pass, and the Awarua or Haast River, and thence up the coast by land or sea. This route, or one by a neighbouring pass to the coast a little

to the south, was described to Dr. Shortland by the Maori Huruhuru in 1842. It was the meeting-point of old Maori roads up the Waitaki and the Moly-neux (Matau) and others. There was an old Maori settlement at Jackson's Bay, where this track reaches the shore; and until destroyed or dispersed by Rauparaha's West Coast party there were Maori settlements at Hawea and Wanaka. From Jackson's Bay the road up the coast to Arahura must have been difficult and dangerous, as there are some twenty rivers to cross. (3.) By the seashore from Cape Farewell in the extreme north. The possibility of walking by the shore from Cape Farewell to Arahura was demonstrated by Brunner and Heaphy in 1846. They found it excessively laborious, and passed over bluffs and headlands by means of rude ladders constructed years before by Rauparaha's raiders, who had come down this way. Even as late as that date they found old Maoris living near Cape Farewell who told them of the feuds which had prevailed in their young days, the character of which showed that the occupants of the greenstone country never had had friendly neighbours in the district to the north of their own. They were consequently utterly isolated until the passes from the East Coast became known. (4.) By the passes from Canterbury. North of the Haast Pass the next met is Whitcombe's Pass, one hundred miles north, connecting the south branch of the Hokitika River with the Rakaia. Next is Browning's Pass, connecting the Kokotahi, or north branch of the Hokitika, with the Rakaia. Then comes Arthur's Pass, the most convenient of all, crossed by the coach-road, but probably unknown to the Maoris, connecting an affluent of the Taramakau with one of the Waimakariri. Next is Harper's Saddle, on the borders of the Provinces of Canterbury and Nelson, connecting the Taramakau with the Hurunui, which was still used thirty years ago by the Maoris, who rafted themselves down the river on mokihi (rafts made of Phormium stems). (5.) By the passes from Nelson. These lead into the

Grey and Buller valleys, and as these enter into the historical narratives I will mention them later.

In order to rightly understand the position of a tribe of Maoris in primitive times occupying the West Coast country, the relative positions of the east and west coasts of the South Island, and of each to the North Island, must always be borne in mind. We have thus seen that an immense range of mountains separates these two territories. Between the Otago and Canterbury passes we have a range which the Rev. R. Green describes as “a great mountain-wall sending off numerous spurs rising into bold alpine peaks, and for over a hundred miles possessing no col or pass free from eternal snow and ice.” North of this the main range is for another one hundred miles a little lower, and through it are three or four practicable alpine passes already referred to. The West Coast has a rainfall of over 100in., and is everywhere clothed to an altitude of 3,000ft. or 4,000ft. with dense forest with a wet undergrowth of ferns and mosses. The numerous rivers liable to sudden floods have wide gravelly boulder-beds, and these are the highways. Up these the passes are approached, and then the traveller crosses amid a wilderness of rare white alpine flowers. Steep mountains, innumerable torrents, constant landslips, sudden snowstorms—all nature conspired to make the passes fearfully dangerous until engineering skill took them in hand. It requires even now an effort of imagination to recall the difficult and dangerous task of the greenstone-raider of olden times where—

In Höhlen wohnt der Drachen alte Brut,

Es stärzt der Fels, and äber ihn die Fluth.

The difficulties which beset the first miners who worked their way across are half forgotten now that a splendid road exists. In truth, however, to the last the two countries were separated by a wall which none but the bravest climbed, making the isolation of the two territories almost complete. Had Hannibal had such a country to deal with he would not have crossed the Alps in the face of a resolute enemy. To this day each region has more traffic with the North Island than with its immediate neighbour. It is, then, quite intelligible that a people long lived on the West Coast, holding occasional intercourse with the North Island, fighting constantly with the tribe immediately to the north of them, and utterly unknown to the tribes of the East Coast, neither knowing the way to penetrate to the other district.

It is, of course, possible that Ngatimamoe or even Waitaha had known of roads to the West Coast, of which no record was transmitted to their conquerors; but it seems more likely that, if they had possession of a little greenstone, it had come

to them either by way of the North Island or by a line of communication leading to Nelson and Queen Charlotte Sound, passing through the hands of some intermediate tribe. The Ngaitahu traditions are very precise as to the time when and place where they first heard of it.

Ngaitahu Conquest of the West Coast.

The West Coast, including the valleys of the Taramakau and Arahura, had for ages been in the possession of Ngatiwairangi, who were its original occupants. According to Mr. Alexander Mackay they sprang from the Ngatihau or Wanganui Tribe. Mr. Stack considers that they came from the east coast of the North Island, and were of common descent with the Ngatimamoe and Ngaitahu. They were settled on that coast before Ngaitahu invaded the East Coast. The latter, or a remnant of them, whose chiefs are the Hon. H. K. Taiaroa, M.L.C., and Topi, of Ruapuke, were busy conquering the Ngatimamoe in the northern part of this Island and had got as far as Horowhenua when they first became acquainted with greenstone.

It is said that a woman named Rau Reka, sometimes called a mad woman, with a small travelling party, found the way up the Hokitika River over Browning's Pass across the mountains theretofore considered impassable, and thence to the East Coasts. Arrived at Horowhenua, in the Geraldine district, she saw some men engaged in making a canoe, to whom she remarked how blunt their tools were. They asked her if she knew any better. She replied by taking a little packet from her bosom from which she unfolded a sharp adze of the kind of greenstone called inanga. This was the first they had ever seen, and they were so delighted with the discovery that they sent out three Ngaitahu to accompany the visitors to the coast and fetch some. On their return they stated that it was found at

Arahura; after which it came into general use for tools and weapons, those of inferior material being, according to Mr. Stack's informants, discarded.

This led in time to a skirmish between Ngaitahu and Ngatiwairangi, in which blood was shed. Te Rangitamau led an expedition up the Rakaia and across the ranges to avenge this. Uekanuka, a great chief of the western tribe, was killed, and the expedition returned. A second expedition fared disastrously, being defeated at Mahinapua. A third expedition was followed by others, which effected the conquest, and, pursuing the fragments of this tribe, continued the war up to recent times—perhaps the first quarter of this century—when Ngatiwairangi were finally destroyed as a tribe in the battle of Paparoa, and their survivors incorporated with Ngaitahu. The branch of the latter tribe which settled there took the

name of Poutini—I suppose, from the mythical name of Ngahue's fish-god or stone.

The Poutini-Ngaitahu had shortly after their first occupation to fight for their conquest, being attacked by Ngatitu-mata-Kokiri, a tribe dwelling farther north on that coast and about Massacre Bay, with whom they had frequent fights about the right to catch ground-birds in the upper Grey and Buller districts. This tribe, which seems to have had a warlike career, and was ultimately destroyed to the last man in fighting North Island invaders, is supposed to be the same which attacked Tasman's boat in Massacre Bay in 1642.

Mr. Stack puts the visit of Rau Reka about 1700; but thinks that traffic in greenstone had probably sprung up between Ngatiwairangi and the North Island tribes bordering on Cook Strait long before it became known to Ngaitahu. The existence of such a traffic is proved by reference to greenstone implements in North Island traditions of earlier date; but apparently these references are very rare in the earliest traditions.

Ngati-toa Invasion of the South Island.—Rauparaha.

Mr. W. T. L. Travers, in his charming but sanguinary narrative of “The Life and Times of Te Rauparaha” (Trans. N.Z. Inst., vol. v., p. 19), shows the connection between the bloody raids of that great Ngatitoa chieftain into this Island and the lust for greenstone. Rauparaha had been squeezed out of his own country, Kawhia, and, had, in conjunction with his allies Ngatiraukawa, who likewise had wandered from their home in the centre of the Island, occupied as a stronghold the Island of Kapiti, in Cook Strait, and as much as he could hold of the mainland. A chief of Ngaitahu named Rerewhaka imprudently boasted that he would rip open Rauparaha's belly with a shark's tooth. Nominally to avenge this, but really out of lust for conquest, Rauparaha made a series of sanguinary expeditions down the coast of this Island, in the course of which Rerewhaka was killed and many of his people made slaves. The Ngaitahu were known to be rich in greenstone, and, according to Mr.

Travers, Rauparaha longed to add the acquisition of such treasures to the gratification which he would derive from wreaking vengeance on the Ngaitahu chieftain for the insult under which he had so long suffered. Ngaitahu of Kaikoura and Amuri had long been in the habit of sending war-parties across the Island for the purpose of killing and plundering the inhabitants of the district in which it was obtained, and at this time a branch of their tribe held that country as conquerors. There were two routes in this quarter. The expedition sometimes passed through the Tarndale country to the upper Waiauuha, and

thence through Kopiokaitangata, or Cannibal Gorge, at the head of the Maruia River, into the valley of the Grey, whence they ran down the coast to the main settlements from the mouth of that river to Jackson's Bay. At other times they passed from the Conway and other points on the East Coast through Hanmer Plains to the valley of the Ahaura, a tributary of the Grey, and so to the same localities. On the line of the former route Mr. Travers's shepherds have frequently found stone axes and many other objects. During their journeys to the coast through these rugged scenes the war-parties lived entirely on eels, wekas (Ocydromus australis), and kakapos (Stringops habroptilus), which at that time were numerous in the ranges; whilst on their return, after a successful raid, human flesh was carried by the slaves they had taken, and the latter were not infrequently killed in order to afford a banquet to their captors. During these expeditions large quantities of greenstone, both in rough blocks and in well-fashioned weapons—the art of fashioning these being especially known to the West Coast natives—were often obtained if the approach of the invaders was not discovered in time to permit the inhabitants to conceal themselves and their treasures. And it was the accumulated wealth of many years which Rauparaha expected to acquire in case he should prove victorious in his projected attack upon Rerewhaka and his people. In one of the expeditions the famous Te Pehi was treacherously killed while on a visit to a pa: not, however, before he had secured some fine specimens of South Island art, as his grandson Wi Parata, of Waikanae, formerly a member of Parliament, has now in his possession two beautiful meres of inanga, besides other objects. His friendly visit was to obtain some presents of pounamu, including a mere for himself, though why he should take a hundred men with him on that journey, the place being a hundred miles from Kaikoura, where the main force remained, is not quite clear. When finally the disaster overtook Ngaitahu at Kaiapoi Pa by which their power was broken it is said that they threw great quantities of greenstone into the deep swamp behind the pa, whence it has never been recovered.

West Coast Branch Expedition.

The narrative would be incomplete without a brief reference to this. The invaders, under Niho and Takerei, passed down the coast from Cape Farewell by land, scaling the otherwise almost impassable cliffs by means of ladders, which they made of climbing-plants. The numerous rivers—some of great volume—were crossed by means of rafts and of the canoes found on their banks. The local tribes were massacred wherever found, save such as were able to find refuge in the dense forests. Thus the country was conquered as far as

Hokitika.

Among the prisoners taken was Tuhuru, chief of the Poutini-Ngaitahu, who on the return of more peaceful times was ransomed for a greenstone mere called Kai-kanohi (Eat the eye), which is still in the possession of the tribe. Later a party of more adventurous spirits continued the journey down the west coast, and, crossing by the Haast Pass, or one in that neighbourhood, surprised and massacred the natives settled at Hawea. One boy, Rangitapu by name, who still lives, an old man, at Port Molyneux, escaped, and warned his father, the chief at Wanaka, and he and his family fled down the Waitaki. The invaders, making rafts of Phor-mium stems with the help of their prisoners, floated down the great and rapid river Matau, or Molyneux, whose volume is said to equal that of the Nile, and thus passed right through Otago. Their appearance on the south coast, near the mouth of the Mataura, led to a hurried assemblage of fighting-men, headed by Tuhawaiki, from all quarters, including, it is said, white whalers and sealers from Foveaux Strait; and this ended in the defeat and almost total destruction of the invaders. The remnant were made slaves, one chief being kept a prisoner for many years. The tale has only been preserved in an obscure form. Since this invasion Maoris have never inhabited the interior of Otago. There is evidence that at one time a large population lived at or regularly visited Lakes Te Anau, Manapouri, Wakatipu, Hawea, and Wanaka. At the two former lakes numerous objects of greenstone have been found, and recently a great number have been ploughed up at Lake Wakatipu.

Results.

The military overthrow of Ngaitahu at Kaiapoi never became a conquest giving a title to their territories; but in after-years the first white travellers who reached Arahura found the population strangely mixed. Nominally the tribe was the Poutini branch of Ngaitahu, with some of the remnants of the original Ngatiwairangi incorporated; but some of Rauparaha's Ngatitoa and Ngatiraukawa had detached themselves from the expedition, which swept that coast in a murderous man-eating raid, and settled with their old enemies there. Besides, there were some of the scattered fugitives from Kaiapoi, who had fled in terror from Rauparaha's arms, and even some from Otago, who had probably accompanied them. These had just effected the sale of their territory to the Queen when the miners swarmed into the country, from which in a few years they sent out gold to the value of ten millions sterling.

The practical outcome of all the sanguinary wars to which I have briefly alluded has been considerable. Considered.

in detail their study leads to nothing; considered as a whole they can only be regarded as a precursor of white settlement, which has proceeded in the South Island almost unobstructed by the native difficulties which have arisen in the North Island, repeating here the history of the Roman Britons,

whose petty contentions gave to the northern invaders the power to sweep them back to the western ranges.

Age of the Art.

As to the date at which the Maoris commenced to work greenstone, we have only the uncertain traditions which I have already narrated. It is very probable, however, that the North Island had been long colonised before it was known. This would still be probable even if credit could be given to the story of Ngahue bringing back a single stone to Hawaiki, and making implements and ornaments of it, a story which Mr. Tregear thinks we probably do not rightly understand, for the place where that stone was obtained would have to be discovered anew. Mr. Stack thinks, as will be seen from his answers (Nos. 4 and 5), that Ngatiwairangi occupied the West Coast in very early times, and that the story told him at the Thames that a hei-tiki held by the natives there was brought by their ancestor Marutuahu from Hawaiki may indicate that some of the Taranaki and Cook Strait people obtained greenstone from these Ngatiwairangi at a very early date, long before it became widely known. This seems very probable, as Ngatiwairangi, working up only small quantities, would not for a long time push a very active trade, and would probably keep the secret of the locality where the stone was found. It did not, in all probability, get extensively into use until visitors were allowed to search for it and carry it away in bulk, or came as invaders and did this without permission; though no doubt travellers from the greenstone coast spread a certain amount among their distant friends and relatives. “Notwithstanding,” says Cook, “the divided and hostile state in which the New-Zealanders live, travelling strangers who come with no ill-design are well received and entertained during their stay, which, however, it is expected will be no longer than is requisite to transact the business they come upon. Thus it is that a trade for poenammoo, or green talc, is carried on throughout the whole Northern Island.”

If it be the case that the Waitaha, who, according to Mr. Stack, must have flourished in this Island before 1577, and whose destruction by Ngatimamoe began about that date, were the people who destroyed the moa (Dinornis) and the pouakai (Harpagornis), then there is some evidence, though it cannot be deemed very satisfactory, that the Waitaha had something to do with greenstone. The recent observations of

Mr. H. O. Forbes at Monck's Cave, Banks Pensinsula, point in this direction. The cave was at some remote period closed by a landslip, and for many years the colonists have carted away the slipped material for road-making. In this way the existence of the cave was discovered quite recently. The cave was found to be in the condition in which its Maori inhabitants had temporarily left it when the slip occurred. On the floor were found beautifully-made implements of greenstone. Scattered about were numerous largish fragments of moa-bone, and fish-hooks and barbed spear-tips of the same material. On the surface were bones of swans, a bird extinct beyond the memory of man in New Zealand. “Just below the surface of an untouched part of the midden,” says Mr. Forbes (Trans. N.Z. Inst., vol. xxiii., p. 374),” I myself picked out pieces of moa-egg shells, each with its internal epidermis perfectly preserved.”

Whatever other evidence there may be, there is nothing in this absolutely to refute the idea that these objects may have lain for generations—perhaps for centuries—in a dry cave to which the air had so little access that its dryness was always preserved, as even in the destructive climate of Funk Island the eggshell of the great auk is sometimes found when taken from the ground to have the epidermis still adhering to it. It can only be offered as suggesting that the owners of these implements knew the moa and its eggs. Mr. Forbes has kindly given me the opportunity of inspecting the eggshell in his possession. The pieces are small, and if preserved in undisturbed dry ground may be very old. The greenstone objects in the Christchurch Museum taken from this cave are undistinguishable from those constantly found in Maori camps.

The character of the objects found in the cave shows that the inhabitants were probably North Island Maoris; and von Haast long ago found that the articles in the neighbouring Sumner Cave, left there by a people contemporaneous with the moa, pointed in the same direction, being made of wood growing exclusively in the North Island.

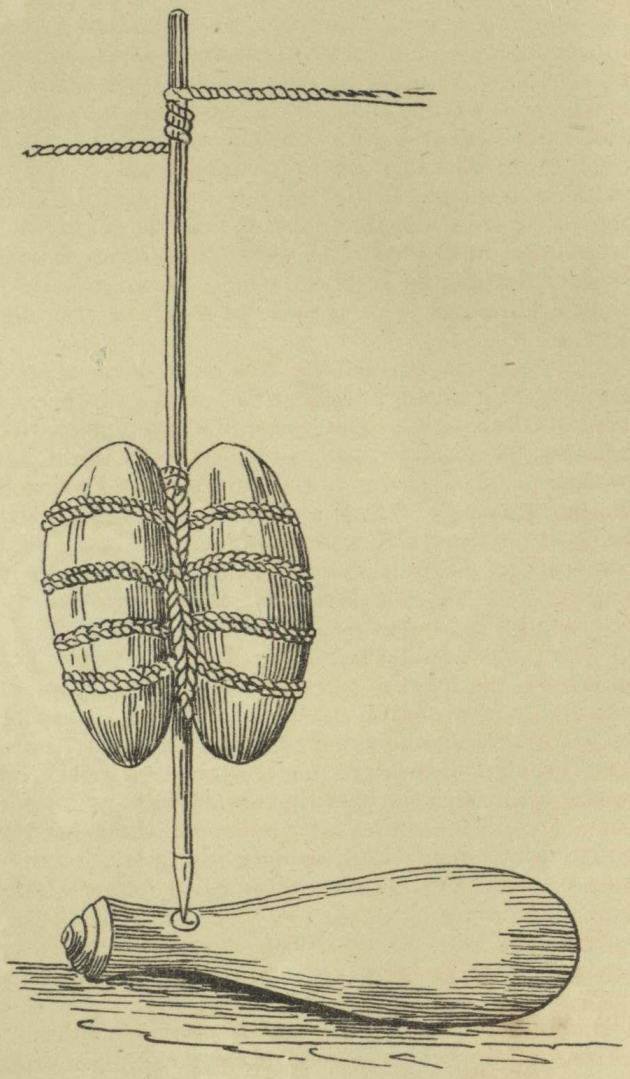
If this be so they were probably visitors from Cook Strait. As von Haast did not find greenstone among the objects referred to, it is on the whole more probable that that found in Monck's Cave belonged to a people of later date, who in using the cave had not greatly disturbed the relics of its former denizens. The evidence derived from the state of the eggshells must therefore be regarded as inconclusive.

In a somewhat extensive examination of the great beds of moa-bones at Shag Point, which Mr. A. Hamilton and I made in January, 1891, he found one piece of greenstone. It is 6in. in length by 1 ½in. in width and ¾in. thick, and is of a tolerably

good quality of kawakawa. It bore no distinct resemblance to any familiar implement, being more like one of the rubbers or polishers which we find in numbers there, having the two opposite broader sides distinctly concave. I do not agree with Mr. Hamilton in thinking that it has been used as a sharpening-stone for putting a final edge or polish on implements, as I do not know of any stone in the polishing of which greenstone would offer any advantage for such a purpose over common sandstone. I find, moreover, on submitting it to inspection by means of a hand-glass that it has been shaped by grinding by means of a coarse hoanga or sandstone; that the striæ run across it at an angle of 45°, as is usual with unfinished greenstone implements; and that these traces of workmanship run over every part of it evenly, which would not be the case had it been used as a tool merely. It has been sharpened by means of considerable labour, and is of great interest, as it was found imbedded in the great bed of moa-bones broken by human hands, in a zone where, amid masses of fractured bones, implements of moa-bone and cut fragments were also found.

Though no greenstone has ever been reported from this zone, the situation was such as to satisfy Mr. Hamilton and myself that those who fed upon the moas—who it is now universally admitted used polished-stone implements, of which we found a few fragments—also knew and worked greenstone, though probably only as a very rare stone received through the indirect channels already suggested. It is, of course, very difficult to exclude every possibility of error, but we could neither see nor conceive any, though we carefully directed our attention to the subject at the time. The only source of error we could imagine was that it was possibly buried in a hole dug for the purpose; but its situation rendered this extremely improbable. Indeed, we found none of the indicia of secondary displacement of the heap there or in any part. The broken moa-bones were interlaced over the implement in the same way as elsewhere. It was several feet under the surface, and within a few inches of the sand-bed on which the mass of bones lay, and in the near neighbourhood we found many moa-skulls, attached to long strings of vertebræ, lying in sitâ.

In von Haast's case in the Christchurch Museum, devoted exclusively to Shag Point, among a collection of schist drills, implements of moa-bone, &c., are three very small polished greenstone chisels of kawakawa and a larger one of an inferior stone. There is no label to explain from what zone they were taken—and greenstone objects are often found on the surface there—and the ordinary presumption would be that he placed them in that case with objects which he



PIRORI OR MAORI DRILL.
after Shortland.

F.C. del.

formerly insisted were not relics of the Maoris, but of an older race of moa-hunters, as being of contemporaneous origin with those objects. However, for what it is worth, I should mention that von Haast has placed the chert knives on one side of this case, and has marked them from the moa-hunters' encampment.

Modes of working.

There can be no doubt that the highest expression of Maori art is a thing of the past. The highly-skilled wood-carvers who worked with tools of stone, or bone, or sea-shell are all gone, and have given place to rougher workmen who use steel tools: still, some of the work of the present day is beautifully done, and good workmen should be encouraged. Thomson, in "The Story of New Zealand," says few specimens of mechanical skill are furnished by the natives, the highest example being the fashioning of hard greenstone into meres and ornaments. This is done by friction with flint and wet sand. The greenstone-cutter of olden times has almost disappeared, though Captain Mair, a high authority, informed me a few years ago, contrary to the opinion I had expressed, and which had been published by Professor Fischer, that some few old men still worked hei-tikis. A better notion, however, of the modern method is, I think, to be derived from a re-translation of what I wrote to Professor Ulrich: "When the political prisoners were down here (at Dunedin) two years ago, I saw more than a hundred men cutting greenstone in a most systematic way. These people worked in companies. They had gridiron-like apparatus made of fencing-wire, having each ten or fewer bars. This apparatus was worked backwards and forwards with a sawing movement between two of them, while a third fed the machine with water and sand out of an old teapot or some similar vessel. In this way a slab was cut into eleven narrow strips, which were then rubbed down into ear-pendants on a flat stone, and afterwards drilled through at one end. When afterwards liberated the Maoris had thus accumulated a little capital in the shape of manufactured goods, the Government having supplied the raw material. They also made meres. I saw them making one in the gaol-yard on the grindstone. This occupation tends to keep them in bodily and mental health. One day I saw two of them cutting a piece of malachite in two. This they called 'Pounamu no Ingirani '—i.e.., 'Greenstone of England.'"

It is evident from an examination of numerous specimens in my collection that greenstone was cut by means of a very blunt instrument. I should say that a cutting-edge ¼in. wide was used for large pieces, while for cutting smaller pieces a narrower though still a very wide tool was used. I find in old

Maori camps numerous pieces of fine sandstone shaped so as to exhibit cutting-edges suitable, and probably used, for this purpose, though probably only in cutting the smaller objects. Dr. Shortland gives the word mania as representing thin laminæ of sandstone used for cutting the pounamu, and says the natives fasten them in frames after the manner of a stone cutter's saw. These must have

been something like that represented in Schliemann's “Ilios” (p. 583) as a flint saw. Much rarer are implements known to collectors as “hard cutters,” made of trap or some similar rock. If these were used, as apparently they were, it must have been with sand and water.

I have been told, and can readily believe, that a great deal of cutting was done with wood and wetted sand, and Dr. Shortland in the documents set out later confirms this. The Rev. Richard Taylor, in “Te Ika a Maui,” refers to the use of greenstone wherewith to cut greenstone:” He saws it by rubbing the edge of one slab on another, and for this purpose suspends a calabash of water with a small hole in the bottom over the stone he is working so that it drops continuously but slowly. He then takes some of the finest quartz-sand, which he continually adds to the groove he is making. Thus, by patience and perseverance he succeeds in sawing it up.”

Brunner, who first explored the West Coast in 1846, makes frequent reference to a kind of micaceous slate used on that coast for cutting and polishing greenstone—probably the kiri-paka of Stack. He says it is found in the bed of one of the rivers of that coast, and in quality resembles a Newcastle stone, though somewhat closer in grain and texture, with a fine cutting quality. He carried two large pieces of greenstone and some polishing-stones with him on his return; and on an exploring journey lasting 560 days, during which he never heard English spoken, he found polishing greenstone a great amusement on wet days.

In cutting a slab in two the ancient workman lightened his labours by working his cuts from both sides, and, when they nearly met, knocking the piece off. The rough break is sometimes a third of an inch through, or even more; and to effect this considerable force, or a heavy blow, must have been necessary.

Major Heaphy, who was Brunner's companion on one of his expeditions, says, “In order to make a mere, a stone is sought of a flat, shingly shape, say, of the size, and roughly of the shape, of a large octavo book. Among the primitive rocks of the Middle Island stones are not wanting of sufficient hardness to cut even the pounamu; and the Arahura natives lay in a large stock of thin pieces of a sharp quartzose slate, with the edges of which, worked saw-fashion, and with plenty of

water, they contrive to cut a furrow in the stone, first on one side, then on the other, until the piece may be broken at the thin place. The fragments that come off are again sawn by women and children into ear-pendants. With pretty constant work—that is, when not talking, eating, doing nothing, or sleeping—a man will get a slab into a rough triangular shape, and about 1 ½in. thick, in a month, and, with the aid of some blocks of sharp, sandy-gritted limestone, will work down the faces and edges of it into proper shape in six weeks more. The most difficult part of the work is to drill the hole for the thong in the handle. For this, pieces of sharp flint are obtained from the Pahutani cliff, forty miles to the north, and are set in the end of a split stick, being lashed in very neatly. The stick is

about 15in. or 18in. long, and is to become the spindle of a large teetotum drill. For the circular plate of this instrument the hardened intervertebral cartilage of a whale is taken. A hole is made through, and the stick firmly and accurately fixed in it. Two strings are then attached to the upper end of the stick, and by pulling them a rapid rotatory motion is given to the drill. When an indentation is once made in the pounamu the work is easy. As each flint becomes blunted it is replaced by another in the stick, until the work is done. Two meres were in process of formation while we stayed at Taramakau, and one had just been finished. A native will get up at night to have a polish at a favourite mere, or take one down to the beach and work away by the surf. A piece of pounamu and some slate will be carried when travelling, and at every halt a rub will be taken at it. Poor fellows! They had no tobacco, and a grind at a piece of hard inanga seemed to be a stimulant."

The condition of many of the pieces separated as above described, by means of two cuts and a break, attests the fact that the workman often had a very indifferent eye, the two cuts not coming opposite each other. In a piece before me less than 1in. thick they are nearly ¼in. "out," giving a very awkward edge to rub down afterwards. I attribute this to the fact that, on the East Coast at least, the workers were generally very old men, past their fighting-days, whose eyes had become impaired with smoke and dirt, as they often are among these people.

What strikes me as very remarkable is the very poor pieces of stone on which a vast amount of labour is expended. It looks as if when a Maori workman could not get a good piece he cheerfully spent months, perhaps years, of labour on a bad, perhaps a very bad, piece. It was, perhaps, only at rare intervals that a tribal expedition returned from the remote West Coast with a new supply. A block which lies before me seems to have some very fine stone in it, with some very poor

[The section below cannot be correctly rendered as it contains complex formatting. See the image of the page for a more accurate rendering.]

stone round the edges. The cut in it suggests the idea that the workman was proceeding to work the good centre to waste, and leave the rubbish to work up into implements, while the cut he is making longitudinally through the centre of the slab, cleaving it into two thin slabs, is not straight. However, he may have known his business better than I do. I have certainly seen instances where the best of the stone has been wasted in the cutting. In the magnificent collection in the possession of Mr. John White, of Anderson's Bay, Dunedin (not to be confused with the late Mr. John White, the author of the "Maori History"), there are twelve pieces showing cuts. The cuts are, as a rule, beautifully clean. Some of them meet perfectly true. In one instance the distance to which the cuts are "out" is so great that one has been turned in with a long slope to make them meet. In some cases apparently rather purposeless cuts are made; in one a very broad axe is cut longitudinally down the centre to make two chisels of ordinary proportions. His finest specimen is a boulder of kawakawa, or auhunga, 13 ¾lb. in weight, one-third of which is being taken off by a longitudinal cut. The proportions of the stone are 12in. by 5 ½in. by 4in. The cut is 1ft. long, and is 15/16in. to 1 3/16in. deep, and from

12/16in. to 15/16in. wide. On the other side of the block is the commencement of a cut which would meet the other neatly. In another case, working on a flat stone, the cuts have so nearly met that the stone was found parted, the two pieces lying together.

In doing the fine work of the hei-tiki and other objects where something like true carving appears, I am told the shell of the common pipi, or cockle, so much used by the Maoris as a ready-made tool, was commonly employed.

I have no doubt that fine-sandstone cutters, which we find in numbers in old Maori camps, were used where procurable. I find the finest class of sandstone in situ at Shag Point, Taiaroa Head. Dr. Shortland says the Maoris obtained it from a place which I take to be the vicinity of the Pleasant River, where Mr. A. Hamilton has found traces of their quarrying operations. In my collection there are many neat little tools of this stone.

It is an obvious feature of Maori stone implements that they never reached the point exemplified, I think, only in Scandinavia, of having a regular hole for a handle. But occasionally Maori implements have a hole through which a string is put to carry it. I have one such of greenstone and one of a commoner stone. In general it is a rare feature. In Mr. J. White's splendid collection, embracing six hundred pieces, there are eighteen pendants, needles, and shawl-pins, and thirty-four other objects, consisting of chisels, fish-hook points, and large pendants so drilled. Some of these large pendants

are mere lobes of highly-polished stone of special colour, one weighing as much as ½lb.

Nearly all these things, it will be observed, require a hole. The mere invariably had a hole, through which was passed the thong which held it tightly to the wrist in action. The hole is usually a wide-mouthed crater sunk in each side of the handle end until the two meet—often meeting rather badly. The work of drilling stone seems to have been most laborious. Smaller objects, such as greenstone needles, and pendants, and hei-tikis, are often drilled, but even then the hole is often unskilfully made, with a great crater mouth, again exhibiting the difficulty of the work. In some cases two or three attempts are made before success is reached. The explanation is to be found later in my note on the drill. In some hei-tikis, however, a piece of stone is left above the crown of the head, and through this a hole is neatly drilled.

Working-places.

No doubt greenstone was worked in all Maori villages in this Island, but certain localities must have been special workshops. At a certain spot at Longbeach, in the Purakanui district, and at a similar spot at Warrington, I find innumerable minute fragments, as if some chipping process had been

carried on there on a large scale; though my authorities assert that chipping did not form part of the process. Curiously enough, these fragments are often polished, as if finished implements had been chipped or shattered there; but the fragments are invariably very small.

In the vicinity of this spot at Warrington (the Maori name of which is Okahau) numerous unfinished objects intended to be of a superior type have been found. The late Captain Pitt, who lived there for years, had a number of these, and I have recently found a very fine one. Here, too, many fine finished implements have been found. Mr. Pratt, member of Parliament for the Southern Maori District, tells me that a small stream near here is called Hohopounamu, or "Rubbing the greenstone;" but the name appears to refer to the dripping of water in the process of rubbing.

By far the richest spot for finished and unfinished implements in this district is Murdering Beach, formerly called Wauakeake. Mr. and Mrs. Hunter, who owned the little farm there for many years, dug up immense numbers in making their garden, and since then numbers of objects have been found by others. In all, some six or eight hei-tikis have been obtained there.

Mr. John White tells me that of his collection, comprising six hundred objects of worked greenstone, about four hundred come from Murdering Beach or its immediate vicinity. Murdering

Beach comprises, perhaps, twenty acres of ground within the limits of which objects are found. This beautiful spot was evidently thickly peopled, and must have been the aristocratic quarter of the district. Remains of burnt whares are found all over the flat ground. Warrington, too, was thickly populated; and it is not difficult even now to dig the remains of old whares out of the sand. The great variety of stone hammers, anvils, and cutting-tools found there shows that it was a regular manufacturing centre.

In Mr. John White's collection are two singularly beautiful spindle-shaped chisels, each 6in. long, and a small axe, all made out of a stone of rare colour. I have never seen stone at all like it. The colour is cream-colour, with patches, streaks, and spots of inanga-green sparsely dotted over it. These three pieces were found together, and it may be assumed with certainty that they were worked there from one block. In the same way there are in the same collection four hei-tikis of a very peculiar streaky asbestos-like stone, answering to that described in the latter part of Question 11. These three were found at Murdering Beach, which lies between the Otago Heads and Purakanui. The finding of these three, apparently made from one block of stone, seems to indicate that they were made there, though, as will be seen, the evidence of the Maori authorities consulted by my correspondents leans to the conclusion that they were never made on this Island, though not conclusive on the point.

One of the most remarkable objects in this collection is an unfinished hei-tiki found at Waikouaiti. All that remains to be done is to finish off the parts which have to be rounded— e.g., nose, arms, legs, and abdomen. Its lowest edge is at present as sharp as the edge of a chisel. This has to be rounded off and notched so as to form that curious semilune which represents the lower part of the legs and the meeting toes in a well-ordered hei-tiki. There is also a very remarkable hei-tiki in the Christchurch Museum. It has evidently been a large one, the bowed legs of which have been broken off by accident. The artist has then set to work to change the design. He has commenced by obliterating the face by neatly grinding it flat.

No doubt greenstone is still worked in many places in the North Island. Mr. J. B. Reid, of Dunedin, tells me that when he visited Lake Waikaremoana some years ago he saw numerous Uriweras working it. They generally worked with a sandstone rubber on the side of a canoe, which had in the bottom a little water, used for wetting the stone.

A collector tells me that, obtaining large numbers of objects by digging in sandhills at Warrington, Purakanui, and other places, he finds most of them in the remains of old whares or

dwellings. When he has cleared away the drifted sand he finds by the presence of hearth-stones that he has reached the floor. Below the level of this he may expect to find in one spot a small collection of treasure. It looks as if there were a receptacle under the sandy floor, which was probably covered by a flax mat. The site of this receptacle may sometimes be detected by a slight discoloration in the sand. In one he saw opened there were two beautifully-finished objects of greenstone and several odd pieces, also several pieces of kokotai, or hæmatite, with the mullers used for crushing it, and several sandstone rubbers. This represents the stock-intrade and tools of a greenstone-cutter, and also the material and tools with which he made the red paint with which, mixed with shark's oil, he adorned his person. I have several of these mullers, still red with the adhering paint, dug out in this way, and I often find the pieces of soft red stone in the camps.

Uses of Greenstone.

As to the uses to which greenstone implements were put, there is evidence that they were used for all kinds of work excepting, perhaps, such rough work as cutting down trees and hoeing ground. I have an adze weighing 51b., suitable for finishing the great slabs lashed on to the canoes to serve for top-sides. These adzes are called kapu. The word for an axe is toki or toki uri. Large adzes of greenstone are rare. Very long slender axes of the finest stone, formerly fitted with beautiful handles, are also rare. The commonest tools are chisels or small adzes, from 4in. to 8in. long and 2in. wide. These are called panehe. Small chisels 3in. long and 1in. wide are not uncommon. Some are as small as 1in. long and ¼in. wide. Mr. J. White has numerous very small chisels, while I have a few of these, and many exactly similar implements in other kinds of stone. His come from Murdering Beach; mine from Foveaux Strait, where greenstone is apparently rarer. The Rev. Mr. Stack tells me

that when he came to New Zealand forty years ago greenstone implements were still sometimes used in carving wood. He has seen a long narrow purupuru or chisel so used in carving the woodwork of the canoe-head. Drills of greenstone are frequently found, and as they have to be of the hardest stone they are generally very beautiful objects. They are not infrequently broken, but I never find them bearing evidence of having been used to bore holes in stone. I think they must have been used generally for working wood and perhaps bone. The point of one kind of implement is often shaped exactly like that of a gouge. Though these are described as drills, they are probably gouges. Another small tool is like a narrow-pointed chisel. In two

instances in Mr. White's collection small tools, apparently drills, present the exceptional feature of four facets meeting at a point, like some of the bits used by carpenters. We know from various sources that greenstone drills were used for drilling the holes by means of which the top-sides were lashed on to the great war-canoes.

Mr. White has some very special objects, such as a pendant needle, or shawl-pin, as thin as a penholder and 7in. long; several fish-hook points, which of course would also serve for eardrops; and a peculiar chisel with a basin-like depression near the edge to accommodate the thumb and finger while the haft end rested on the palm of the hand. Shawl-pins, used for fixing the flax mat formerly the sole garment of the Maori, were more commonly made of bone, but there are several in local collections of this stone. A very curious object in Mr. White's collection is a small fish-shaped spinning-bait or minnow.

Cook, in his first voyage, gives an account of the tools used by the Maoris: “They have adzes, axes, and chisels, which serve them also as augers for the boring of holes. As they have no metal, their adzes and axes are made of a hard black stone, or of a green talc which is not only hard but tough, and their chisels of human bone or small fragments of jasper, which they chip off from a block in sharp angular pieces like gun-flints. Their axes they value above all that they possess, and never would part with one of them for anything that we could give. I once offered one of the best axes I had in the ship, besides a number of other things, for one of them, but the owner would not sell it; from which I conclude that good ones are scarce among them. Their small tools of jasper, which are used in finishing their nicest work, they use till they are blunt, and then, as they have no means of sharpening them, throw them away. We have given the people at Tologa a piece of glass, and in a short time they found means to drill a hole through it, in order to hang it round the neck as an ornament by a thread; and we imagine the tool must have been a piece of this jasper. How they bring their large tools first to an edge, and sharpen the weapon which they call patoo-patoo, we could not certainly learn, but probably it is by bruising the same substance to powder and with this grinding two pieces against each other.” What he here refers to as jasper is most probably obsidian, or volcanic glass, which is plentiful in the North Island, and splinters of which, such as he describes, are found in Maori camps throughout New Zealand.

Polack speaks of the implements in similar terms; but they were out of date in his time—i.e., in 1832. He says, “Much patience was required to put an edge on the mere, which was often managed by pounding the talc to powder,

and briskly rubbing the surfaces together.” I am not sure whether this is an original observation, as I often find Polack borrowing from Cook. Even in 1806 Savage observed the diminishing value of the greenstone implements in consequence of the introduction of iron.

There are some objects the use of which I have not been able to ascertain, but which may be learned from old Maoris in the North. Sir W. Buller informs me that, in making the deep cuts in carving large figures, the artists burnt out a cavity, and then chiselled out the charcoal. This would require small chisels. He also points to a number of smoothly-polished blocks of greenstone, generally 1in. or 2in. long by about the same breadth, and ½in. thick, in his collection and my own. These had long puzzled me. They are burnishers, used to rub down the surface of wood-carvings. I have similar objects of various shapes made of agate or chalcedony which probably served similar purposes. Sound pieces of greenstone are used, and in Sir Walter Buller's collection they are of tangiwai, pipiwarauroa, and kawakawa. One of these has two scraping edges, and has evidently served a double purpose.

Weapons.

The stone axe, or hatchet, was a weapon of war, and no doubt axes of greenstone, as well as of other stone, were thus used. The mere, the most famous weapon of the Maoris, which in ancient times was generally of white whalebone, was in later times—that is, in the last few centuries—often made of greenstone. There are also many in collections made of black trap and similar hard rocks. A greenstone mere is an object of great value. It is usually about 13in. to 15in. long, sometimes longer, and is to be found figured in many books— for instance, Sir John Lubbock's “Prehistoric Times;” while Hochstetter figures the famous mere of Te Heuheu, shown to him by the chief's successor, cut out of the most beautiful transparent nephrite, an heirloom of his illustrious ancestors, which he kept as a sacred relic. It was taken from a hostile chief in bloody combat, and had five times been buried with its owner's ancestors. A notch on one side denoted the last fatal blow struck at a hard skull. The mere was not used like an axe, for a downward hacking stroke: if used thus and parried it might be broken, and thus the labour of years lost. It had a hole through the handle, through which was a strong thong of dogskin, made into a running noose through which the thumb would slip readily. It was carried thrust into the belt. The first contact of the fighting forces was with the hani, or taiaha, a sort of staff, used, however, ordinarily as a walking-stick. This was not pointed, but was used for

striking as a quarterstaff. As the fighting got closer these had to be laid aside, and the mere was then taken from the belt and fastened to the right hand. The thumb was thrust through the loop of the thong, and then one turn made round the hand. To have thrust the hand through would have exposed the warrior to the risk of being dragged into danger by any one who could successfully grasp the blade of the weapon— a risk never run. The left hand now grasped the hair of the enemy, the fingers being twined among the long locks. This probably describes a moment when the enemy had already been reduced to inactivity by many blows, or had been thrown down. Then the blow was struck, rather as a stab, if possible, at the side of the head, where the bones are weakest, and it was thus driven into the brain. Whare-kino, a West Coast chief, had a spear run through his arm by Tuhuru, and, being violently pushed, fell upon his face. Before he could rise Tuhuru caught him by the hair, and was just about to smash his head with his mere-pounamu when he recognised him as his own cousin, and spared him.

Dr. Shortland describes the mere-pounamu to which in the South Island he finds the name rakau-pounamu given. This word means timber, or perhaps club, and may be derived from the use of a wooden club in olden times. There is a highly-ornamented wooden mere, sometimes shaped like an ordinary mere, sometimes like a bill-hook. Tasman, describing in 1642 the attack upon his boat, says that the natives were armed with short thick clubs like clumsy parangs. He does not say of what they appeared to be made, but had they been either of white whalebone or of greenstone he would probably have noticed it.

Famous Implements, etc.

It would be impossible in a paper like this to refer even briefly to any considerable number of the famous historical implements and ornaments of New Zealand. A few only can be mentioned. English lawyers are familiar with the case of Pusey versus Pusey, in White and Tudor's Leading Cases, decided in 1684, which shows that before the days of title-deeds a material object might be the outward symbol of a title to land, and that in this one case the tenure still exists. There the horn is equivalent to a title-deed, and on it is the inscription in what looks like comparatively modern, or fourteenth-century, English,—

Kyng Knowd geve Wyllyam Pewse

This horne to hold by thy lond.

Such cases are not unknown in New Zealand. The title-deed of the famous Heretaunga Block, now worth three-quarters

of a million, was a small pendant now worn by a gentleman on his watch-chain. In finally ceding land to the Queen upon a sale by the native owners a mere has often been handed over as symbolical of title. It is, of course, handed to the white man who settles the bargain. I am not aware of cases where it has got any further towards the Queen, nor does the colony possess any treasure-house for keeping such objects.

The famous heathen chief Te Heuheu, on the night of the 7th May, 1846, was overwhelmed, with all his people save one man, by a landslip burying the village Te Rapa. It is said that the great warrior was last seen praying to or threatening his atua. His mere was the most famous in New Zealand, and is mentioned in the lament written by his brother and successor,—

Sleep on, O chief, in that dark, damp abode,

And hold within thy grasp that weapon rare,

Bequeathed to thee by thy renowned ancestor

Ngahue when he left the world.

I think there must be some confusion in this, as it was the famous eardrop called Kaukaumatua which Tama-te-kapua was said to have brought from Hawaiki, and which had been made from Ngahue's stone, which had come down to his descendant Te Heuheu. This eardrop is often mentioned in Maori history. It was the subject of a fight between two sons of Tama-te-kapua, who was supposed to have brought it from Hawaiki, and was buried by one of them but recovered by his nephew. Some years before Te Heuheu's death it was appealed to in a dispute as to the ownership of Flat Island, in the Bay of Plenty, claimed by his relations. It was agreed that those who could prove relationship to its possessor could establish the best title to lands first occupied by their common ancestor Tama-te-kapua. In later times a hundred men were successfully employed in digging out the famous mere, which is still held by the tribe. The bones of its mighty owner were carried high up the mountain Ruapehu, and there left on a ledge of rock; from which cause that mountain remains sacred to this day.

When Sir Donald McLean in 1856 brought to a close the protracted and complicated negotiations by which the Government finally acquired from hostile and conflicting claimants the northern end of the South Island, he had his greatest difficulty with the district about Tory Channel and Queen Charlotte Sound, as from its past associations the natives attached great importance to it as the scene of many hard-fought battles, and of final conquest. When signing the treaty of cession, Ropoama te One, after alluding to these wars in an emphatic harangue, struck into the ground at the

feet of the Commissioner a greenstone axe, saying in their usual style of metaphor, “Now that we have for ever launched this land into the sea, we hereby make over to you as lasting evidence of its surrender this adze named Paiwhenua, which we have always highly prized from having regained it in battle after it was used by our enemies to kill two of our most celebrated chiefs, Te Pehi and Pokaitara. Money vanishes and disappears; but this greenstone will endure as durable a witness of our act as the land itself which we have now under the shining sun of this day transferred to you for ever.”

Mr. Travers mentions several celebrated meres—viz.: One with which Te Wherowhero, the father of the chief who afterwards became the Maori King, and is still so called, killed two hundred and fifty prisoners of war at a sitting, smashing the head of each with a single blow. His son still has the mere. Another, called Kai-kanohi, now in the possession of the descendants of Matenga te Aupori, with which, as has already been mentioned, Ngaitahu once ransomed Tuhuru, who had been taken prisoner by Rauparaha's branch expedition. I have elsewhere referred to the two beautiful weapons which Te Pehi has left to his descendants: Others are connected with the history of the North Island tribes.

In the early part of this century a splendid mere was buried secretly in a swamp in Southland to settle a dispute as to who was to inherit it. Not long since a half-caste, in digging a post-hole for a fence, accidentally dug it up, and restored it to the heir, death having settled the dispute. Similarly one now lies hidden in a swamp beyond Riverton. It is well known that in the North Island many have been hidden, and in many instances mortality in the tribe has obliterated all knowledge of the hiding-place. Occasionally lost meres are found and recognised, to the great joy of the tribe. On other occasions Europeans have found them buried in the ground or hidden in old hollow trees. Indeed, Polack's prediction, made fifty years ago, has been fully realised—namely, that in future many aboriginal curiosities would be discovered by European colonists, as the New-Zealanders have been in the habit from time immemorial of burying with their dead the favourite axes and implements of stone that were highly prized by the chiefs whilst in existence.

Other Ornaments and Objects.

The mako, the beautiful tooth of the tiger-shark, is much prized as a keepsake, and is handed down from generation to generation; but its inferiority to a jewel of kahurangi or pounamu of the first water is recognised in the ode,—

That is worthless—

That is the bone of a fish;

But were it the little pounamu,

That ancient source of evil

The fame of which reaches

Beyond the limits of the sky—eh!

In the list of ornaments given by White the word ”mako” occurs, referring evidently to a greenstone imitation of the shark's tooth. Rings are mentioned by some writers. The Maoris keep tame parrots with rings round their feet. In the Christchurch Museum is a prettily-carved parrot-ring of greenstone.

In addition to the hei-tiki, fuller reference to which is made hereafter, and those above mentioned, the Maoris had a great variety of greenstone ornaments. Of these, only a few can be described hers, thus: (1.) Lobe-shaped ornaments, suspended from the neck when very large, and from the ear when smaller. Some of these are referred to in the description of colours. (2.) Small objects with a slight resemblance to the human form, slighter, and flatter, and more formal in shape than the hei-tiki, though perhaps also so called; others without resemblance to human shape. There is a peculiar fish-shaped hei-tiki in the Christchurch Museum. (3.) Earpendant, called kapeu or kapehu, curved at the lower end; and numerous other forms of ear-pendant. Fish-hook points, also used as pendants. Kapeu whakapapa was a genealogical staff with the generations notched upon it. They are more commonly made of wood. (4.) Mat-pins of various sizes and shapes.

Tikirau.

Sir W. Buller supplies me with the following:—

“Tikirau, the ancient name of a kapehu or tara (long pendant with curved extremity), presented by Heni te Rei, daughter of the late chief Matene te Whiwhi, to the Hon. Huia Onslow (the infant son of the Earl of Onslow, Governor of New Zealand), on the occasion of his presentation to the Ngatihuia Tribe, at Otaki, on the 12th September, 1891.

“This kapehu is of pale kawakawa, and is not of the very best quality; but the relic is valuable because it was an heirloom in the family of Te Rangihaeata, the fighting chief of the Ngatitoa. The Maoris associate it with the following karakia (or incantation):—

“Ka haere hine, ka haere hine,

Te ara nui no Tikirau,

Hoki atu, hoki mai

Ka rarapa ki te rangi,

He uira.”

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Authorities.

At the risk, perhaps, of becoming tedious, and of being accused of repeating matter, I now give the original answers of my correspondents to the questions which I drew up for Professor Fischer; and I take this opportunity of thanking them for the trouble they have taken. I set out the questions in full, in order that the answers may be fully appreciated, and in the hope that their publication may induce other Maori scholars to send me further information.

Questions asked by Mr. F. R. Chapman, of Dunedin, for Professor Fischer, of Freiburg.

You are requested to return this paper with answers to these questions, giving all possible details, and stating any facts within your knowledge besides those touched upon in these questions.

1. How did the natives make the figures known as hei-tiki, and what was their method of working greenstone?

2. In the process did they use chipping-instruments, or was anything done by grinding?

3. Are these objects idols or gods, or the portraits of ancestors, or what do they represent?

4. Are the existing hei-tiki the result of the patient labour of modern or comparatively modern people, or are they objects remaining in the hands of the Maoris from a former age, the relics of an earlier vanished culture?

5. Is such a vanished culture to be inferred as well from these highlyworked objects as from the fine wood-carvings of this race? Is it supposed that they came to New Zealand with a knowledge of these advanced arts, or that they have so advanced themselves here?

6. Do the natives continue to make these objects? Do they make them in their ancient fashion or by means of modern appliances?

7. Have the Maoris any traditions or superstitions on the subject of or with reference to these objects? Are individual hei-tiki treated with reverence? Are they highly prized by Maoris beyond their money value?

8. Do the Maoris make other objects in greenstone than hei-tiki, and articles of actual use, such as axes, chisels, &c.?

9. How many varieties of greenstone do the Maoris recognise? What are their names and description, and what peculiar use or value has each?

10. Where is greenstone found in sitâ in a virgin state? Whether in more than one place?

11. Is a rusty yellow-coloured nephrite known in New Zealand? Is a peculiar nephrite with thread-like streaks, having a beautiful silky lustre like asbestos, common in New Zealand?

12. Is the true name of the South Island “Te Wai Pounamu,” The Water of Greenstone, or “Te Wahi Pounamu,” The Place of Greenstone?

13. Have the Maoris any traditions as to when they first found and began to work it?

14. Have the greenstone objects occasionally seen in other oceanic islands been carried from New Zealand, or is the stone native elsewhere?

15. Are the greenstone and other hard-stone axes first chipped to shape and then polished, or are they all ground to shape from water-worn stones?

16. Can you state any special native customs, superstitions, traditions, or other lore relating to greenstone, or objects of greenstone?

17. Was greenstone really the object of Rauparaha's invasion of this Island?

18. Are there any other traditions of wars on this account?

Answers of John White, Author of the “Ancient History of the Maori.”

10. The pounamu was found in blocks in the rivers and creeks at the south end of the South Island. Some was also found in the creeks which run into the lakes of that part of New Zealand. Some was also found in the creeks and sounds in that part of the South Island.

13. Tradition says that a chief called Nga-hue was driven out of Hawaiki by Hine-tu-o-hoanga; that Nga-hue, after landing on various islands, at last arrived in New Zealand, and, having found the pounamu on the South Island of New Zealand, on his return to Hawaiki he took some pounamu with him, and with axes made from that greenstone some of the canoes were made which came over to these Islands with Kupe, Turi, Hotu-roa, Nga-toro-i-rangi, and others.

14. All that can be said on the question is answered in No. 13.

1, 2, and 15. The pounamu was broken as best they could break it into pieces when in boulders or large blocks, but it was not chipped— it was bruised to take any angle or point off. It was then rubbed into shape with a stone called mataihona, takiritane, hoanga, onetai, patutane, and ureonetea, with chips of kiripaka as a drill. These stones were called by different names in the localities (by the natives of the districts), in which they were obtained. In some instances a piece of pounamu would be found of a flat or slab shape. The mataihona was then used to cut a line on each side of the slab, and when the cut was sufficiently deep the slab was broken into pieces, thus cut into a rough form of a mere. The ureonetea, takiritane, patutane, and kiripaka were used as drills to cut holes in the pounamu to form a hei-tiki, and when the holes were made to form the arms and legs of the Tiki then the mataihona was used to form the Tiki. The drill used to make the hole in the mere was made with kiripaka and ureonetea. These were broken into spike-like shapes, and placed in the end of split wood [drill-spindle], and tied tightly, the upper end of this wood being placed in a block of timber placed in position to receive it [mouthpiece, or drill-cap]. Two stones [weights] were tied to the upper end of the drill [to steady it], the kiripaka or ureonetea being placed on the mere where the hole was to be made, and a string was wrapped round the drill above the stones [weights], and next to the block of wood [mouthpiece, or drill-cap]. These strings were pulled first one and then the other [the unwinding of one causing the other to wind round the spindle], thus giving a rotatory motion to the drill. A little of the pounded dust of the mataikina and water were put to the point of the drill at various times of the work. [Observe that Mr. White describes a piece of wood by way of a mouthpiece or drill-cap. He does not say whether it was held in the mouth or pressed down with the flat of the chin or the breast of the workman. Compare Mr. Wohlers's interesting description, and Note 3, post.]

3 and 7. These objects were not idols or gods, nor were they the portraits of ancestors, but, as the name implies, hei (for) -Tiki, or, for, or to be used as, Tiki, or to be like Tiki. The value or sacredness of these was derived from the fact of their having been worn or handled by the dead of past ages.

4 and 6. Some of the hei-tiki now seen are many hundred years old, others are of more modern date. The mode of making the hei-tiki in ancient times is that now practised.

5. They brought the knowledge with them.

8. Yes; toki (axes) and eardrops, as kurukuru kapeu, mako (of greenstone), kani (ring), porotti, and many others.

9. Many sorts of greenstone—namely, kahurangi, inanga, tangiwai,

totoweka, and fourteen others, all of which are grades less in value than the kahurangi. [I have never seen a list containing eighteen names, but I have seen some with some of the names I have collected repeated with qualifying adjectives to describe minor variations. There is one word here, totoweka, which would mean weka's blood, which does not occur in my other lists. It must be the variety with red streaks or spots.]

11. This is called totoweka [weka = the bird Ocydromus]. This, or something like it, is called inangatangiwai. [The rusty yellow-coloured nephrite for which Herr Fischer inquires is extremely rare. I have seen one piece that would answer this description. The expression inangatangiwai evidently indicates one of the numerous grades described in Answer 9, the names of two kinds being combined to describe it.]

12. “Te Wai Pounamu” is the correct name.

16. Yes, but it would fill a book of moderate size to give it. As I am bound to time in writing the Maori History I am compelled to give these answers in this very short way; but all these questions will be fully answered in the history now being compiled. [Mr. White's history had reached the completion of vol. v. when he died, and one volume has appeared since. A mass of MSS. was left, and it is to be hoped that this will some day see light. The published portion does not treat of greenstone save in

the chapters incorporated from the Rev. Mr. Stack's writings, the substance of which I have incorporated in this paper.]

17. No; not in the first instance. His invasion was to obtain a home for himself and tribe, as he was being pressed by his enemies the Kahungunu, and being urged on also by his revenge for his relation Pehi.

18. Yes; but in the first instance all the wars undertaken by the natives of the North Island were for conquest of country, and consequent on their being driven out of their homes by fear of stronger enemies; but eventually it became a great point to obtain possession of a land in which the greenstone might be obtained.

Answers of the Rev. J. W. Stack, Missionary to the South Island Maoris.

[Note.—I have thought it best to leave in the signs of quantity placed by Mr. Stack over the vowels to aid pronunciation.]

1 and 2. The tools used in the manufacture of greenstone were—

(a) Kūrū Pōhātū.—A stone hammer. Nothing more than a conveniently-shaped boulder of greenstone about the size of a human skull. If the piece to be broken off was for a mere it was necessary to insure against any cracks. This was done by cutting a deep groove before striking the piece off. [I have made a large and interesting collection of stone hammers, some of which must have had wooden handles, while others were used in the hand. They are of trap, quartz, and various other stones. I have never seen one of greenstone. I have a great many hammers of very small size, evidently for very fine work. Bruising is mentioned by White and others as a mode of reducing angles and points. Two unfinished axes in the Colonial Museum, at Wellington, show admirably that bruising was used to reduce the size of the handle part.— F. R. C.]

(b) Pūrihi pōhātū.—A sharp-edged chip of trap or any other hard stone for cutting grooves. [Called a hard cutter in the text.]

(c) Hōāngū.—Sandstone or other gritty kind of stone for rubbing down the rough surface and polishing. [For this I have adopted the word “rubber,” as the words “grindstone” and “whetstone” are inapplicable. They are coarse or fine according to the work to be done.—F. R. C.]

(d) Kūrūpākū.—A micaceous stone, plentiful on the West Coast,

used for rubbing down and polishing. [See references to Brunner and Heaphy's Journal.]

(e) Mātā.—Obsidian for pointing the drill, or pirori. [I have many of these in flint and quartzite, commonly but erroneously called chert: they are in every stage of wear.—F. R. C.]

Having procured a suitable-sized piece of stone for the article to be made, the workman placed it either on the ground or on a slab of wood cut to fit it. The surface was then rubbed down with a hōāngā, the greenstone being kept constantly moistened with water. The only tools employed in forming the hei-tiki were those above mentioned.

3. They are portraits of ancestors, and were highly valued. ["Mementoes of ancestors," used later by Mr. Stack, is a better term.—F. R. C.] It was the custom to bury them with the wearer after death, and then to remove them when the bones were taken up for final sepulture. The nearest of kin employed in the rites connected with the removal of the bones to their final resting-place became the possessor.

4 and 5. The custom of wearing the hei-tiki was probably imported from Hawaiki. During a visit to the Thames about twelve years ago, Paraone, a chief residing in Grahamstown, showed me a small illformed hei-tiki which, he said, had once belonged to Marutuahu, son of Hotunui (vide "Polynesian Mythology," by Sir G. Grey, p. 246), one of the original immigrants from Hawaiki. One branch of the family resided near Taranaki; one at the Thames. This hei-tiki had passed backwards and forwards from one branch to the other during successive generations, the relatives who performed the ceremony of hāhūngā taking possession of it each time. If this particular hei-tiki was a fair specimen of the workmanship of the original settlers, the Maoris in later years had improved in the art of making them. Both the knowledge of macrving wood and working in stone must have been imported by the original immigrants from Hawaiki. Most of the hei-tiki in existence were made before the beginning of this century, and are of comparatively modern workmanship. As far as I can recollect, the best specimens I have seen were those said to be about a hundred or a hundred and fifty years old.

6. No. Since intercourse with Europeans became constant (say, 1820), the Maoris have ceased to make hei-tiki. They were difficult to make, only the most skiful tohungas, such as could macrve and tattoo, undertaking the manufacture. Meres, axes, pendants, &c., required little skill, and their manufacture was the favourite occupation of elderly gentlemen.

7. They are very highly prized as heirlooms for having been actually in contact with the sacred bodies of their revered and noted ancestors.

8. Axes, chisels, adzes, meres, ear-pendants, as well as hei-tiki.

9. Seven different varieties:—

(a) Inanga.— A whitish stone, not much prized, rather opaque. [I cannot quite assent to the expression “not much prized,” as I have been informed by many good authorities that it comes next to kahurangi, which is the rarest stone.—F. R. C.]

(b) Kāhōtēa.—A dark-green with spots of black through it, rather more opaque than the other varieties. [I presume the expression “spots of black” would include patches and streaks. A large number of chisels, &c., of this description have been found at Murdering Beach. Vide post, Dr. Shortland's answers, tuapaka.—F. R. C.]

(c) Kāwākāwā.—A very bright green; semi-transparent. [This is the beautiful greenstone of commerce, much used by lapidaries.— F. R. C.]

(d) Aūhūngā.—Pale-green, between inanga and káwakawa. Not so transparent as the latter.

(e) Kāhūrāngī.—A darker green, without flaws or spots; semitransparent.

(f) Kahurangi.—Like the former, but with pale streaks of inanga through it.

[As kahurangi is repeated, I presume that the former is a hard clear stone, and the latter similar but with beautiful fleecy clouds in it of the whitish tint of inanga. The most beautiful piece I ever saw is in the possession of Wi Parata, of Waikanae, the grandson of the great Te Pehi.—F. R. C.]

(g) Kōkōtāngīwāi.—A soft and brittle variety found at Piopiotahi or Milford Sound, and in small pieces along the beaches to the northward of that place. Beautifully clear and transparent, with the

appearance of water-drops in the texture of the stone. Hardens on exposure to the air. When first taken from the block can be worked with an ordinary knife and file.

All the other varieties of greenstone are extremely hard. When found in the river-beds the surface of the stone resembles that of the surrounding boulders, and only the trained eye can detect its presence among them.

[When free from cracks, flaws, or joints, all the kinds of greenstone save kokotangiwai or tangiwai (tear-water) are so hard that the steel point of a penknife will not scratch the stone, but will leave a metal trace.— F. R. C.]

10. Up the Arahura River and other streams between Hokitika and Greymouth, and at Milford Sound. As far as I have been able to ascertain, greenstone has only been found in detached blocks, varying in size from pebbles to rocks 20ft. square.

11. I do not know.

12. Wai Pounamu. All greenstone, till the occupation of the country by Europeans, and the consequent clearing of the forests on the West Coast, was found either in river-beds or along the beaches.

13. Vide “Polynesian Mythology,” by Sir G. Grey, K.C.B., page 132. [Already narrated.]

14. I heard from the late Tamihana te Rauparaha that when the Rev. Riwai te Ahu returned from a cruise in the Melanesia Mission vessel he brought back from some island a piece of greenstone.

15. The boulders were broken up with hammers into convenient-sized pieces, and then ground down with hōāngā.

16. I can recall nothing at present.

17. I have always been told that Rauparaha came for greenstone, Rerewaka's curse giving him a good reason to put forward for his invasion. Rerewaka was a Kaikoura chief, and after his destruction and that of his people there was no reason for Rauparaha going a hundred miles further south, unless he went, as alleged, for greenstone. Just before the European occupation of the country greenstone was fast being recognised as the medium of exchange, and the Maoris, since they became familiar with our money, have often spoken of greenstone as the Maori's money in

time past. Rauparaha was shrewd enough to see the advantage of possessing an unlimited supply of the existing medium of exchange.

18. I do not know of any in particular, but I do know that in times past wars occurred from one tribe, or a section of a tribe, desiring to get possession of articles of value as ancestral relics, which were wrongly retained by others. Most of the greenstone worked up in the South Island was macrried across the Southern Alps on men's backs in a rough state. The labour of procuring the stone was very great. The tracks across the mountains were most dangerous, and some one skilled in prayers and charms always attended the party of macrriers, who led the

way, uttering petitions for safety whenever the party reached any particular difficulty. On reaching the coast the tohunga performed certain religious rites, and retired to rest alone, and in his dreams a spirit would come and indicate the spot where a stone would be found. On waking, he would summon his companions, and, spreading themselves along the river-bed, they would proceed up stream till they reached the spot indicated in the vision, when the stone was sure to be found, and received the name of the spirit who revealed its position. This method of discovery is still adopted; and I have a piece of greenstone in my possession that is known by my name, the finder, an old chief at Arahura, having found it in a place indicated to him by my spirit during the visions of the night.

Supplemental Answers by the Rev. J. W. Stack.

Dear Sir,— Duvauehelle's Bay, 31st July, 1881.

I have just received from an old Maori chief, Hakopa te Ata o Tu, at Kaiapoi, the following replies to a translation of the questions forwarded to me by Dr. von Haast. I attach great value to them, as the writer is a very intelligent man, who occupied a leading position in the Maori community here at the time of Rauparaha's invasion. James W. Stack.

1. I never saw the process of making hei-tiki being macrried on here (South Island) when I was a child. [Hakopa is at least eighty-three years old.—J. W. S.] Hei-tiki were all made in the North Island.

2. Obsidian and chips of hard stone, but no chisels, were used in making hei-tiki. Very hard stone, obsidian, and a grindstone were the tools used in shaping greenstone.

3. People never prayed to hei-tiki. They were mementoes of deceased ancestors, to remind their posterity.

9. (a) Hauhunga [hauhunga=frost, cool.—F. R. C.]; (b) kawakawa; (c) inanga; (d) kahurangi; (e) tangiwai; (f) matakirikiri—greenstone pebbles; (g) aotea—a counterfeit greenstone, opaque; often mistaken when in the river-beds by the unskilful.

10. Arahura, Waininihi, Hohonu (Taramakau), Piopiotahi, were the streams in which greenstone was formerly found.

14. When I see you I will tell you of the discovery of greenstone [Already related above.]

15. Some greenstone could not be broken by any other stone but greenstone.

Answers of Dr. Shortland, formerly Native Secretary.

1. The method of working is described in Shortland's "Southern Districts of New Zealand" (London, Longmans, 1851). Holes are drilled by a drill of native invention, the grinding apparatus being a sharppointed stick of soft wood, sand (fine, and of a biting quality). The patu, axe, implements, &c., were rubbed into form on slabs of sandstone. The supply of water for such operations dripped through a small orifice in some vessel conveniently placed. The hei-tiki was similarly fashioned by rubbing with a pointed stick, sand, and water. [The above work by my correspondent, Edward Shortland, M.A. Cantab. (a physician, who was formerly Native Secretary, and is the author of several works on New Zealand), is an admirable account of the state of the Maoris in the South Island in 1842–43, before there was a single inhabitant where the cities of Dunedin and Christchurch now stand. Visiting Waikouaiti, Dr. Shortland says, "Here I saw for the first time on a large scale the native method of grinding pounamu, or greenstone, from the rough block into the desired shape. The house belonging to the chief Koroko was like a stonecutter's shop. He and another old man were

constantly to be seen there seated by a large slab of sandstone, on which they by turns rubbed backwards and forwards a misshapen block of pounamu, while it was kept moist by water which dropped on it from a wooden vessel. While one rubbed the other smoked. They made, however, so little progress on it during my stay that it seemed probable that it would be left for some one of the next generation to finish the work. It is not, therefore, to be wondered that what has cost so much labour should be regarded as the greatest treasure of the country." Elsewhere he says, "When procured it is fashioned and polished by rubbing it on flat blocks of sandstone. This is a work of so much labour that to finish such a weapon as that of Te Heuheu often requires two generations." Mr. John Richard Jones, who as a boy knew Dr. Shortland at Waikouaiti, tells me that he never saw the Maoris working greenstone or making stone implements, but saw them using stone implements of black trap in building canoes.]

2. No chipping instruments were used—simply sandstone, fine sand, and water, and a stick for drilling or groove-work. Stones were reduced in size by rubbing them with laminæ of sandstone used like a saw. I have specimens of incomplete work done in this way: one where it was intended to make a pair of axes, the faces of two axes being partially complete, and the stone to be divided in twain about one-third completed.

3. They are merely grotesque representations of the human form. The name is derived from hei, which seems to mean a necklace, and Tiki, the progenitor of the human race, the Epimetheus of the Greeks. Any image of a man is known as Tiki. Their value greatly depends on their antiquity. It is the practice to bury such and other valued articles with the dead. After a time they are removed, and then are specially valued. I remember a chief excusing himself from giving me an eardrop because it was a pirau-tupapaku—i.e., a thing with a dead taint.

4. The art is of ancient times, and endured till recently.

5. The wood-macrving skill was in full force when the colony was formed. They came to New Zealand with the art, and practised it continually here.

6. Our grindstone has been used for making patus, and a cross-cut saw and sand and water for sawing blocks into slabs, after the manner of stone-cutters.

7. A celebrated eardrop (Kaukaumatea) is reported to have been brought from Hawaiki by Tama te Kapua, a chief of the Arawa Tribe, and was in the possession of the chief Te Heuheu, with whom I have conversed, but was buried with him and others in a landslip at Taupo, and has never since been recovered.

8. This is answered in No. 2.

9. I have recorded six varieties,—

(a) Kahurangi.—Bright green, translucent, the most prized; used for eardrops and other valued objects.

(b) Pipiwahairoa [Pipiwarauroa: Buller].—White and green. So named from a bird resembling it in plumage [the shining cuckoo— Chrysococcyx lucidus].

(c) Inanga.—Whitish.

(d) Kawakawa.—Bay-green. From resemblance to leaves of a shrub of same name [Piper excelsum].

(e) Kawakawa tangiwai.—Resembles the colour of greenish glass. [This name is probably a mistake for kokotangiwai.—F. R. C.]

(f) Tuapaka.—Inferior stone; green and black intermixed. [A large number of pieces in Mr. White's collection correspond to this. It seems to have been used up for chisels and small tools. See Mr. Stack's answers—kahotea.—F. R. C.]

10. In the South Island, on the west coast, in several mountain-streams. [Dr. Shortland, in his "Southern Districts of New Zealand," says, "Specimens of stone are found in detached blocks or pebbles… The places most renowned near which it is sought are Arahura and Ohonu [Taramakau], on the north-west coast; Wakatipu, a lake in the interior, one of the sources of the River Matau (the modern Clutha, or Molyneux); and Piopiotahi, a torrent on the south-west coast." No white man had then seen Lake Wakatipu. The errors in this statement are elsewhere explained.—F. R. C.]

11. A dirty-yellow colour I have seen, but understood that it resulted from the action of fire. The sort with a silky lustre like asbestos is found on the west coast of the South Island. It is said to be found on the beach after heavy gales—possibly derived from some reef seaward.

12. I do not think the name Wai Pounamu was applied to the whole Island. [See on this subject a reference to Dr. Shortland's memorandum elsewhere.—F. R. C.]

13. Vide Sir George Grey's "Mythology and Traditions." [Referred to fully ante.—F. R. C.]

14. Vide idem.

15. Made by rubbing on sandstone or otherwise, as described above.

16. Vide Sir George Grey's "Mythology and Traditions."

17. Vide Shortland's “Traditions and Superstitions of New-Zealanders,” p. 253, ed. 2; the account of the wars being translated from a narrative by his son. The cause was a curse by Rerewaka, a chief of Kaikoura (called the Looker-on Mountains by Captain Cook), as stated to me by his son. The following-up of the war to Kaiapoi was caused by a chief or relative of Rauparahu named Te Pehi going into a large pa there in a peaceable manner with the object of obtaining a patu-pounamu as a present. He and his party were murdered. This led to the continuation of the war, and a great distrust of all natives as far as Taumutu.

Other Authorities.

Major Heaphy, already quoted, gave, in 1862, a brief description of the qualities of greenstone:—

Of pounamu there are the following kinds, namely:—

1. The Inanga.—This is the most valued by the Maoris. It is rather opaque in appearance, and is traversed with creamy-coloured veins. The best meres are usually made of this stone.

2. The Kauairangi [Kahurangi].—This is of bright-green colour, with darker shades or mottled, and is the most translucent. It is a brittle material and not easily worked. Ear-pendants are frequently made of it.

3. The Kawakawa.—This is of a dark olive-green, and has rather a dull and opaque appearance. Hei-tiki and ear-pendants are composed of it.

4. Makatangiwai [=Kokotangiwai].—This is the least esteemed by the Maoris, but by far the most beautiful of all. It is a clear palegreen, and is very translucent. The natives will drill a hole through a pebble of it and hang it to a child's ear, but do not macre to fashion it into any shape. It is the only kind of pounamu that would be esteemed for the purposes of ornament by Europeans.

[Note.—Kawakawa is now largely used for jewellery in the colony.]

Other Varieties.

I have collected from various sources other words describing varieties and subvarieties, or perhaps local words.

1. Raukaraka.—A term much used about Cook Strait to describe the olive-coloured streaked variety of kawakawa. [Rau=leaf; karaka= Corynomacrpus lævigata.]

2. Kuru-tongarewa [Kuru = an ear-ornament; tongarewa = a precious jewel].—It is sometimes, apparently, connected with greenstone thus:—

3. Kawakawa-tongarewa.

4. Kuru-pounamu.

5. Tutaekoka (a stain in greenstone explained in a story already narrated).—I am unable to obtain a satisfactory meaning for koka. Mr. Tregear suggests koko [= the bird tui = Prosthemadera], which seems probable.

6. Kawakawa-aumoana.—Kawa = the plant Piper excelsum; moana = the ocean; au = cloud or fog. Perhaps the whole suggests seafoam.

7. Kawakawa-rewa.—Rewa = to melt. Explained to me by a chief as like whales' blubber.

Answers of the Rev. J. F. H. Wohlers, Missionary at Ruapuke, Foveaux Strait.

Dear Sir,— Ruapuke, Southland, 15th November, 1881.

Yours of 20th October, asking for information about the art of working in pounamu or greenstone among the Maoris, has come to hand. I will try and write you about my observations as far as they go. I will also enclose a paper on the same subject in German, which I think you might like to send to Professor Fischer at Freiburg.

I think that the ancestors of the Maoris long ago were in the possession of some culture, which they had lost during their migrations to the South Sea islands, where they sank down to what is called the period of stone implements [This, of course, must be regarded as impossible—F. R. C.]; and that the noble bearing among the chiefs' families and the sense of art are remains of that culture. But the greenstone ornaments, weapons, and figures are the results of long persevering labour with stone tools. Many of the old Maoris could make simple ornaments, but only a few could produce the high

and peculiar works of art. The figures or images were never worshipped. The Maoris as long as they have resided in New Zealand never worshipped idols, as their mythology and traditions show. Neither were their hei-tikis representatives of ancestors. They were simply works of art, and as such were highly prized. They went as heirlooms from generation to generation in the families in whose possession they were, and on this account only were they considered as sacred family treasures. It has happened that when families were dying out the last possessors of such works of art buried them secretly in the earth, so that they should not come into other hands.

There is an old tale of a mad Maori woman who long ago wandered from the West Coast, where greenstone is found, into the high mountains, macrrying a greenstone axe with her. By good luck she found a passage over and through the mountains, and wandered on to the East Coast, where, south of Banks Peninsula, near one of the large rivers, she came upon Maoris who were chipping with axes made of inferior stones. She said to them, “Your axes are not good: try mine.” Then the woman was questioned about the greenstone place (wahi pounamu); and, having listened to her description about the road thereto, it was resolved to visit that place. Two large parties were formed for that purpose. One party perished in the snow and ice on the high mountains; the other reached the West Coast, and returned with greenstone.

My observations are limited to the Maoris on the shores and islands of Foveaux Strait. The pieces of greenstone in the raw state came, and still sometimes come, from the West Coast, where it is broken out of the rocks; but how it is imbedded there I cannot tell. When, forty or fifty years ago, the South Island was frequented by European whalers and sealers, some young Maori men went with them in their vessels to the West Coast, and brought pieces of raw greenstone back. A Captain Anglem, of that time, who lived in retirement on Stewart Island, told me that he had blasted greenstone rooks with gunpowder on the West Coast. But before that greenstone had been brought here, very likely, both overland and by sea, in canoes.

When I came among the Maoris here in 1844 there were still some real tohungas (wise men) living among them. Some men were learned in old tales; some were skilful in works of art: but such very high art as has been found in the North was never produced here in the South. Let us now look at one of those old artists such as I observed thirty-seven years ago. He is advanced in years, and hard labour no longer agrees with him. Sitting and doing nothing, his nerves will not be quiet; so he takes in hand a piece of raw greenstone, looks at it, and thinks what can be made of it. By-and-by he begins to rub it on a suitable stone. It takes a long time before a bright smoothness appears; but even a very slow progress cheers his mind, and the monotonous rubbing quietens his nerves. When he feels tired he ceases rubbing and enjoys rest. So it goes on through, perhaps, many years. By-and-by the idea which had been conceived in his mind begins to gain shape in the greenstone. Then fresh ideas about detail come into his mind, and he has to work with different stone tools—large and small, thin, and pointed. To bore a hole or to make fine depressions he has a wooden staff about 18in. or 2ft. long; at the lower end is fastened a sharp splinter of a hard stone; in the middle of the

staff is fastened a small fly-wheel; round the upper end he winds a cord, and holds the two ends of the same one in each hand. Now, while comfortably sitting, and the greenstone being fastened below him with the sharp end of the bore upon it, he skilfully balances the latter in an upright position, and as he draws alternately with his hands the tool revolves in fast motions forwards and backwards. Formerly time was not considered among the Maoris—no one knew how old he was. Many old Maoris were engaged in similar hobbies, which, as they had no literature, were blessings to them.

The old Maoris were good judges of the quality of greenstone. They also showed and explained to me the goodness and defects thereof; but I did not learn enough of that science to be able to give a description of the same. All those old Maoris are now dead, and the present generation has adopted the ideas and fashions of the Europeans. They therefore leave the polishing of beautiful stones to European artificers. Some raw greenstone may still be in the possession of Maoris here, but I think very little is left of works of art.

You ask, “Was greenstone really the object of Te Rauparaha's invasion?” My answer is that very likely Te Rauparaha may have boasted that he would conquer the Wahi Pounamu, but I think he and his people were only continuing the savage history of the South Island. Long ago there came from the North a tribe called Ngatimamoe. They killed and ate of the Maoris found by them in the South. After them came the Ngatitahu Tribe from the North Island, and began to kill and eat the Ngatimamoe on the South Island. They had nearly finished them when Te Rauparaha and his people came to kill and eat the Ngatitahu, but were stopped by Christianity and by European immigration and civilised government.

Yours, &c.,

F. R. Chapman, Esq., Dunedin. J. F. H. Wohlers.

Observations On the Authorities.

Several points in the matters touched upon in the foregoing answers appear to call for observation, though I feel much diffidence in venturing to criticize anything coming from gentlemen of the standard of knowledge of my correspondents. Certain obscurities and apparent differences are, however, in a large measure capable of being explained and reconciled.

1. The Hei-tiki: its Significance.

White's derivation is overruled by all other authorities. Hei is a neck-ornament. This name is given to me by competent Maori scholars to represent several forms of bone ornaments hung from a string round the neck. Tiki is the name given to the large carved figures on the gables of houses or set up near houses. This, then, is a small copy—a neck-tiki. The tiki represents, and the word is derived from, the name of the god Tiki. He is sometimes spoken of as the progenitor of mankind, and enters into numerous mythical tales. According to some authorities there were several gods Tiki. It seems certain that these objects were not gods or idols, nor were they in any way worshipped. Messrs. White, Stack, Short-land (second paper), and Wohlers, beside other authorities, are substantially in agreement as to their true import. Though Dr. Savage, who visited New Zealand in 1806, thought they were protecting deities, for some unexplained reason he uses the expression “the man in the moon” in describing them.

Mr. Wohlers's account of the hei-tiki offers in all probability the true solution of the apparently conflicting views. They were not portraits of ancestors, but they were, as Mr. Stack says, mementoes of ancestors. They became sacred and ever more sacred from the touch of the sacred dead, and so became indissolubly connected with the memory of ancestors. Why they were named after Tiki, or Adam, is a matter now lost in the mist of time. The old missionaries, who had an ignorant aversion for everything connected with heathen worship, had none for this object or its uses. The Rev. William Tate, who lived in New Zealand in 1828–35, says that the idea that it was connected with superstitions arose from the fact that the hei-tiki was taken off the neck, laid down on a tuft of grass or a clean leaf in the presence of a few friends meeting together, and then wept and sung over, in order to bring more vividly to the recollection of those present the person recently slain, whose body they will never see again, to whom the hei-tiki belonged. In this way it is used as a remembrance of all those who have worn it, and is called by the name of the individual whom it for the moment represents. It is wept over

and caressed with much affection, and those present cut them-selves severely in token of their regard for the deceased. These amongst other manatungas (keepsakes or heirlooms) are much valued. When not received from friends, similar objects may be purchased for a trifle. Similarly, Thomson, describing it as the most valued of all their ornaments, varying in size from a shilling to a plate, says, “When a long-absent relative arrives at a village the hei-tiki is taken from his neck and wept over for the sake of those who formerly wore it. There is no doubt they are handed down from father to son for generations—indeed, for centuries. They were deposited with the bones of the dead until they were removed to their final resting-place.” The practice of burying them when the last of a family dies continues to this day, and is doubtless the reason why so many of them and other valuable objects are found buried.

Dieffenbach refers in somewhat similar terms to the practice of wearing them by Maoris of both sexes, and connects them with the grotesque colossal busts at Easter Island and elsewhere. Thomson shows the reverence in which they were held as representing the dead, narrating a story of

an English sailor travelling with him who dared to remove one from a monument by the roadside, and only saved his life by hastily restoring it.

The hei-tiki is best described as a grotesque squat figure with a big head and attenuated legs, resembling some kinds of Hindoo idols. Its arms are bent, and its feet meet below. The hands, as on the great tikis of wood, and, indeed, in all Maori carvings, have only three fingers. Mr. Tylor, in his "Early History of Mankind," quoted with approval on this head by Mr. Travers, says, "Some New-Zealanders lately in London were asked why these tikis usually, if not always, have but three fingers on their hands; and they replied that if an image is made of a man and any one should insult it the affront would have to be revenged, and to avoid such a contingency the tikis were made with only three fingers, so that, not being any one's image, no one was bound to notice what happened to them."

It is worthy of note that Parkinson, who went out with Cook on his first voyage, never figures a really good hei-tiki, though several flat ill-finished specimens appear in his book. It may be that the highly-worked specimens were rarer then than fifty or sixty years later, when the missionaries began to describe them.

Writing to me on the subject of the manufacture of hei-tikis, Mr. Helms says, "I was told by a Maori at Blenheim that as many as eight or nine slaves were given for one. Have you heard anything like this? I tried also to find out how

they were made, but all may informant could tell me was that it took a long time, and that the old men would sit in the sun and grind away, humming at it all the time. He put the action to the word, and described circles round the eyes of a hei-tiki I had, at the same time doing a hissing hum. The description seemed to me very natural, because the humming would counteract, so to say, the monotonous grating of the operation."

Though the best authorities agree that the hei-tiki was not made in this Island, this must be taken subject to an exception. Major Heaphy, in his account of his visit to Arahura in 1846, says that he there saw hei-tikis receiving their last polish. The inhabitants of that place consisted largely of Ngatitoa and Ngatiraukawa conquerors, who had formed a part of Rauparaha's West Coast expedition, and it was probably some of these North Island people who had recently introduced this art.

2. Te. Wai Pounamu.

The weight of authority is against Mr. Wohlers on the subject of the name of this (South) Island, though Major Heaphy and a few others take the same view. Wahi Pounamu would mean “place of greenstone,” though a Maori has told me that it is an inadmissible form of expression. Wai Pounamu means “water of greenstone.” He suggests that the former is correct, and that it applied to the district where the stone was found. The pronunciation of the two words is very different. Captain Cook, in his way of spelling, wrote “Tovy Poenammoo.” He treats “Te Wai “as one word, in which case the short vowel might without great inaccuracy be written “o,” and was so written by other writers of later date, until the missionaries reformed and settled the Maori orthography. He fancied, probably with truth, that the “w” was there a “v,” as he often writes it so; and he gave “y” as the English equivalent for the long vowel-sound which we now write “ai.” By no process can “Te Wahi” be got out of his word. Had he heard it he would have written it “Vahee” or “Wahee.” Cook got the name from an old man at Queen Charlotte Sound. Speaking of the land South of Cook Strait, he says, “This land, he [the old man] says, consisted of two whennuas, or islands, which may be circumnavigated in a few days, and which he called ‘Tovy Poennammoo.’ The literal meaning of this word is ‘the water of green talc;’ and probably if we had understood him better we should have found that ‘Tovy Poennammoo’ was the name of some particular place where they got the green talc of which they make their ornaments and tools, and not a general name for the whole southern district.”

In his narrative of the third voyage the geographical ques-

tion is more explicitly dealt with. He concluded from the statements of natives that the stone was obtained near the head of Queen Charlotte Sound, and not above one or two days' journey from his ships—an error arising from an imperfect knowledge of the language, the distance being probably two hundred miles by any available road. His account of the fabulous tales of the natives has already been given. He adds, “As they all agree that it is fished out of a large lake or collection of waters, the most probable conjecture is that it is brought from the mountain and deposited in the water by the torrents. This lake is called by the natives Tavai Poennam-moo—that is, ‘The Water of Green Talc;’ and it is only the adjoining part of the country, not the whole southern island of New Zealand, that is known to them by the name which hath been given to it on my chart.”

This notion of a lake in which the stone was obtained was a source of great confusion to geographers, who before the interior was known placed it on the maps at random, generally about the site of the shallow Taieri Lake, fully three hundred miles' journey from the true spot. The fables Cook heard are to some extent collected in this paper; but probably most of them are lost. Cook was probably right in his notion as to the name of the country—so far, at least, that it was not originally general—and Dr. Shortland bears him out in this; but in speaking of it in the North Island the term got to be general, and that is now undoubtedly the name of the Island. It was'doubtless so called because the greenstone was always got in or about water, either in a river or on the seashore—not, as Dr. Shortland thought in 1844, about Lake Waka-tipu.

Major Heaphy describes the mode of searching for it. The River Arahura appears to cut through some veins of this stone, and to bring down fragments of it in the floods. On the subsidence of the water the natives wade about searching for it in the bed of the river, and the heightened colour of the stone in the water soon reveals it to them.

Parties from distant places travelled to Wai Pounamu, the water where the greenstone was found, and this term gradually became the name used by the North Island people to apply to the South Island. Rauparaha, early in this century, pointing to the south, said, as he abandoned his home to begin his famous march, “The people of Kawhia are going to Kapiti, to Wai Pounamu.”

Dr. Shortland insists that neither Island ever really had a name, and that in the case of the North Island Cook picked up a Maori phrase descriptive of it. White gives an earlier name for the South Island as “The Food-abounding Island.“The

truth is that, as in the case of Europe and America, and even our own Province of Otago, a local name, or the name of a limited territory, has gradually spread to a very large area, and, looking out from the North Island, men point to the mountains of Wai Pounamu as if that name applied to the whole country. Cook must have misunderstood his first informant in one way, as he spoke of circumnavigating the two southern islands in a few days, while it required many months to circumnavigate the North Island, both statements being exaggerated.

Closely connected with this subject is that of Piopiotahi. In the deed of sale by Ngaitahu to the New Zealand Company, dated 12th June, 1848, Milford Sound is called Whaka-tipu Waitai, and on the attached map it is called Wakatipa Waitai. This mistake is rectified by the purchase-deed of Murihiku or Southland, which gives the true name Piopiotahi for this mighty fjord. As the Maoris gave Sir James Hector the name Wakatipu for the lake now called Kakapo or McKer-row, in the next valley to the north at Martin's Bay, that must be the true Wakatipu Waitai, or tidal Wakatipu. Some years earlier Dr. Shortland had constructed a map from information supplied by Maoris, in which Lake Wakatipu appears as “Wakatipua;” while the range of mountains which separates that lake from Milford Sound is marked, “Wakatipua Range: in this place rises the torrent Piopiotahi.” He gives a more detailed map of the lake district, drawn by a Maori named Huruhuru, in which the lake appears as “Wakatipua, the famed Wai-pounamu.” In the text he says that Wakatipua “is celebrated for the pounamu found on its shores and in the mountain-torrents which supply it,” and conjectures that it may be the Waipounamu of Cook. This conclusion is manifestly incorrect. Modern references to Piopiotahi always connect it with Milford Sound; and, as the shores of Wakatipu are now inhabited, we know that no greenstone is found there Doubtless the confusion has arisen out of the fact that two waters bear similar names—one being the salt-sea (tide-water) Wakatipu, and the other having been sometimes called the fresh-water sea; while colonists erroneously applied the reference to a

sea-coast Wakatipu to Milford Sound, which they knew, rather than to the lake some miles inland, which was unknown.

On the other hand, tangiwai in plenty lies on the beach at Anita Bay, in Milford Sound, where, however, the only apology for a torrent is a watercourse, generally dry, coming down the mountain. Sir James Hector, in his admirable report to the Provincial Government of Otago on the geology of the sounds, in 1863, refers to this beach as the place where the Maoris ob-

tained the greenstone. He failed to find the dyke, which was my experience thirteen years later; but I am now informed that it is higher up the spur. Some greenstone is said to be found on a stream in the opposite side of the sound. Short-land gives, in addition to Arahura, both places—"Wakatipu, a lake in the interior, one of the sources of the Matau; and Pio-piotahi, a torrent on the south-west coast;" and mentions that at the latter place a block some tons in weight lay in the stream. A whaler, finding this, got up a company in Sydney to work it for the China market. After much labour and destruction of tools they found that it was spotted and would not take the China market. It sold in Wellington for one shilling per pound.

3. The Drill.

The description of the drill is singularly interesting. The fly-wheel was originally a couple of very heavy stones, of which I have several in my collection. Mr. White's description suggests the top of the drill-spindle working in a drill-head or mouthpiece. Mr. Wohlers makes it work without this support. Whether the primitive Maoris ever had a mouthpiece is doubtful: to any one who has used a drill it would seem incredible that a man who had once used one should ever try and work a drill without one. The late Mr. I. N. Watt, Sheriff of Otago, who was a very clever mechanician, told me that when he first went to Taranaki, of which province he was Superintendent, the Maoris had a very primitive drill: He taught them to make and use the bird-cage drill, and they at once abandoned their own. The primitive drill was identical with the balanced drill described by Mr. Wohlers. Mr. Watt informed me that the first he saw was steadily and accurately worked, boring a piece of greenstone, by a blind old man. The statement as to the character of the drill is confirmed by my brother-in-law, Mr. M. Cook, of this city, who tells me that in 1888 he saw an old Maori at Rotorua, in the North Island, sitting on the ground, holding down a hei-tiki by means of his two great toes, and drilling a hole through it, using such a drill as is above described, supporting it by merely balancing it.

This is the answer to Mr. Tylor's remark upon an apparent omission in Thomson's description of this drill ("Story of New Zealand," vol. i., p. 203): "There must, of course, be some means of keeping the spindle upright" (Tylor's "Early History of Mankind," p. 242). "Captain Cook could not ascertain how holes were bored in the handles of greenstone meres, as he saw no instrument sufficiently hard for that purpose. It is now known that these holes are drilled with a sharp wooden

stick 10in. long, to the centre of which two stones are attached so as to exert pressure and perform the office of a fly-wheel. The requisite rotatory motion is given to the stick by two strings pulled alternately."

Thomson, in his account of the drill, obviously draws upon Dr. Shortland, who, describing his visit to Waikouaiti, the whaling-station of the late Mr. John Jones, says, "Here, also, I saw the drill with which holes are bored through this stone. It is formed by means of a straight stick 10in. or 12in. long, and two stones of equal weight, which are fastened about its central point, one on either side, opposite each other, so as to perform the office of the fly-wheel in machinery, and to exert the required pressure. One end of the stick, or, as we may call it, shaft, of the instrument is applied to the pounamu where the hole is to be bored. Near the other end are tied two strings of moderate length. One of these is wound round the shaft, close to the point of its attachment, and its extremity is held in one hand while the extremity of the other string is held in the other hand. A motion is now given by pulling on the former string, which, as it unwinds, causes the instrument to revolve, and the other string becomes coiled round the shaft. This is then pulled on with a similar result, and so the motion is kept up by alternately pulling on either string. The point of the instrument can thus be made to twirl round backwards and forwards as rapidly as the point of a drill moved by a bow, and merely requires to be constantly supplied with a little fine hard sand and water in order to eat its way through the pounamu or other stone, on which steel would make no impression." (Pl. XXXVIII.)

It is noteworthy that Dr. Shortland is the only authority I have quoted who describes the drill without a stone point, the grinding being done by sand alone.

Brunner, in his journey down the West Coast in 1846, found at Pahutani limestone rock containing pure flints, which he erroneously thought occurred nowhere else in New Zealand, and ascertained that presents of this stone were carried by the natives to all parts of New Zealand as material for boring greenstone. His companion Major Heaphy's account of the drill then used has already been quoted.

The Rev. R. Taylor, in his celebrated work, "Te Ika a Maui," says that to drill a hole the Maori ties a small piece of basalt or obsidian firmly to the end of a stick the sides of which are weighted with two heavy stones. Attached to the other end of the stick is a string, by which it is made to revolve; and, to keep the point of the instrument constantly on the same spot, a piece of perforated wood is placed over it. Thus ornaments in the shape of human figures are formed. It

appears to me evident, however, that the piece of perforated wood is by no means always used; hence the clumsiness of many holes.

Colours.

An examination of the colours of greenstone with reference to their names and qualities, in which I desire to acknowledge the invaluable assistance of Professor Scott, of the Otago University, shows that with many shades they are mainly grass-green (grasgriin of Radde's Internationale Farben-Scala), or green-grey or pea-green (blaugriin-grau, Radde). Exceptional pieces are found to be shades of vermilion-grey (zinnober-grau, Radde). In each of these three colours or combinations I find that between my own collection and that of Mr. White the extreme points of the gamut of twenty shades are reached. In the grass-greens and pea-greens the foot of the gamut is a creamy piece with a faint-green tinge, while the head of the gamut is difficult to distinguish from black. In the vermilion-grey, or brown, the same thing occurs— namely, the foot of the gamut is a beautiful cream-colour faintly tinged with chocolate, while the head is so dark that its colour would scarcely be made out but for the assistance of lighter pieces occurring in places. In the case of certain of the green colours transparency considerably modifies the apparent colour, while numerous pieces of stone vary so much over their surface that the standard colour must be differently expressed for each square half-inch. In the appended scale I have endeavoured to express, in terms of Radde's standard, the colours of typical pieces of the most marked varieties, but, not being in a position first to submit my specimens to a first-class Maori expert, I cannot profess to present the tables as free from error. Radde's classification of colours is based upon twenty-two cardinal colours, with twenty intermediate colours, making forty-two gamuts or scales, which are expressed on cards. Each gamut exhibits twenty tints, produced by modifying the colour by lightening it or making it darker; so that each gamut runs up from nearly white, showing a trace of the colour, to nearly black, still showing a trace of the colour. They are shaded from dark at the head to light at the foot, and these shades are distinguished, in the annexed table describing the various objects, by letters from α to υ.

Description of Objects Fashioned from Greenstone.

No.	Object.	Colour.	Tint.	Maori Name.	Characteristic Qualities.	Remarks.
1	Pendant of modern workmanship (Chapman)	14, grasgiü	(e)	Kawakawa	Moderately transparent	This may be taken as about typical of the greenstone generally used by lapidaries in New Zealand, It is the most effective for genral purpose, except kalurangi, which is rarely seen, It ranges in colour 14 from (d) to (k).
2.	Highly-polished pendant, lapidary's work (Chapman)	" "	(g) to (k)	Kawakawa, ap-proaching Kahurangi	More transparent, with denseclouds	

3. Magnificentaxe, 16in. long and highly polished, with a small hole drilled at haft end; found at Sandy-mount (white) 14, grasgrün 1st stage; and 15, grasgrün 2nd stage, passing to blaugrü (p) and (q)

(n) and (o) Kawakawa Transparent in varying degrees in different parts I have classed this beautiful object as kawakawa, but it must nearly approach kahurangi, The range of colours and varying tints greatly enhance its beauty.

4. Long implement in the shape of a narrow chisel, with a hole drilled in haft end, from Centro Island, Foveaux Strait (Chapman) 15, grasgün, 2nd stage, passing to blangrün (r) Inanga OpaqueThis probably fairly represents the stone known as inanga, It is placed here in order to give point to the characters of the next class, It ranges from (q) to (t) and lightens at joints to (v), the faintest tint in the scale, Being a dense stone, a large proportion of the implements made of it are very good.

5 Small hatchet from Otaki (Chapman) 38, blaugrüngrau (m) to (u) Inanga Opaque A specimen with more grey.

6. Great adze, weigh-ing 5lb; from kartigi (Chapman) 38, blaugrün grau (h) to (l) Auhunga Slightly transparent This is a stone very largelyused by Maoris, and somewhat difficult systematically to distinguish from the two former, It is, however, in colour most like kawakawa, but in opacity it falls into inanga.

7 Implement (White) 15, grasgrün, 2nd stage, passing to blaugrün (m) to (o) Auhunga Slightly opaque The absence of grey, though not very apparent without comparison, carries this into a different gamut.

8 Hei-tiki, from Murdering Beach (Chapman) 38, blaugrüngrau (k) to (m) Auhunga Slightly opaque A slightly-decreased opacity makes this approach kawakawa.

9 Remarkable lobeshaped pendant, 5in. long, weight 12oz.; from Fortrose (White) 38, blaugrüngrau (c) to (g), flecked with (m) Auhunga, flecked with Inanga OpaqueThis remarkable specimen is flecked with specks of inanga of very small size, which appear to run in from the surface at an angle, giving it a beautiful appearance.

10 Pendant, of very clear transparent stone (Chapman) 15, grsgrün, 2nd stage, passing to blaugrün by transmitted light; 14, grasgrün, 1st stage, passing to blaugrün by reflected light (d) to (e) (p) to (q) Koko-tangiwai Very transparent This is a very beautiful specimen of tangiwai without the “water-drops.” It is like the transparent green sometimes seen in bottles of coloured water in druggists' windows.

11 Flat worked piece (Chapman) 12, gelbgrün, 2nd stage, passing to grasgrün by transmitted light; 13, grasgrün by reflected light (r) to (s) (b) to (c) Koko-tangiwai Very transparent This is similar, but less clear, and has a characteristic yellow tinge.

12 Pendant (White) 15, grasgrün, passing to blaugrün (c) Koko-tangiwai Transparent, with waterdrops This has a bluer tinge, and is typical of the stone possessing globular bodies which look like drops of water, (Tangiwai = tear-water)

13 Hei-tiki, from Centre Island, or Rarotoka (Chapman) 15, grasgrün, 2nd stage, passing to blaugrün and tending to 31, neutral grau, on the back (a) (a) No trace of transparency except a faint trace on the back This is a most remarkable object, and would be called black but that a few patches on the back indicate a slight green colour. In any case it is right at the top of the gamut, It is extremely dense and hard.

14 Very pale axe, from Warrington (White) 13, grasgrün, and 15 (v) (b) Unknown Opaque This beautiful implement is in the palest shade of grasgrün, and may be described as so near white that it is immaterial whether it is classed in scale 13, 14, or 15, as the tint (v) in each of them is similar, It is almost impossible to describe the way in which it is picked out with much deeper patches of grasgrün (15, b), and in which in places these deeper shades, being overlain with the white stone, show through the latter in variegated wisps, where the white stone has been ground thin.

Thumbnail: [Volume 24, 1891 page 531]

View Image

15 Remarkable spindle-shaped chisel of an exceptional shape, 6in, long, ¾in, in diameter (White) Asabove, with spots of 38, blaugrün-grau Asabove Inanga Opaque, and same as above, but with more frequent green spots, streaks, and patches, and these bluer.

16 Another specimen (White) As above Asabove As above.

17 Reddish or brownish axe, from Warrington (White) 32, zinnober-grau(brown) (o) to (t) Doubtful, poasibly Totoweka Opaque This is an extremelyrare stone, Very pale, with a reddish or brownish tinge.

18 Dark-red axe, from Murdering Beach (White) 32, zinnobergrau (b) to (i) Doubtful, possibly Totoweka Opaque This is a very dark and very hard stone, with light patches which show its affinity with the last, though nothing could well be greater than the contrast between them.

19 Small gouge-shaped drill (White) 33, brown, less red than 32 All tints, except the highest and lowest Unknown This, though placed in 33, as being less red than the two preceding, is otherwise a stone, only 2 ½in. long, in which all the intermediate shades are beautifully blended. It might be described as cream-colour and chocolate in all stages of blending, This is probably saussurite.

20 Singularly, streaked axe (White) 38, blaugrüngrau Various Doubtful, but perhaps the spurious greenstone known as Kapotea Mottled A singular piece, more like serpentine than greenstone, and probably a different rock.

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Thumbnail: [Volume 24, 1891 page 532]

View Image

21 Axe of a greenish stone, found at Paremata, Porirua Harbour (Chapman) 38, blaugrüngrau (l) to (m) Possibly Kapotea, certainly not greenstone I have found several objects of this or a similar stone near Paikakariki, in the North Island, and have placed it in this list as possibly corresponding with the "spurious greenstone." It is a beautiful stone, probably a green porphyry.

22 Pendant, lobeshaped, from Murdering Beach (White) 32, zinnobergrau, banded with 38, blaugrün-grau Various Tangiwai, and possibly Totoweka Banded colours In this piece, 4in. long, a piece of tangiwai is banded with about 25 transverse streaks of opaque reddish stone. This is due, no doubt, to the infiltration of iron impurities into a much-jointed piece of stone.

23 Axe, from Boatman's (Chapman) 12, gelbgrün, passing to grasgrün (d) to (e) Raukaraka The prevalence of yellow, especially in the lighter parts, is a marked feature.

24 Mere (Sir R. Stout) 14, grasgrün (e) Kawakawa Moderately transparentThis is a beautiful mere, 13in. long, of typical kawakawa, It is also typical in shape-i.e., 13in, long and 4in. broad, narrowing to 2in. where the hole is bored, The handle is finely carved, and is rather gelbgrün, It was the favourite mere of Titokowaru, and was given by him to the Native Minister in token of his return to featly to the Queen.

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Conclusion.

I cannot but feel sensible that this long paper is diffuse and somewhat rambling. It is, however, intended as a comprehensive collection of data connected with this subject, and I have made it my chief endeavour that it shall be as complete as possible, at the risk of rendering it interesting only for purposes of reference. No doubt there is a great deal of repetition; but my excuse for this is that I thought it most desirable that these Transactions should be made the receptacle for authentic original matter rather than matter made readable. I am fully aware that in some departments it must prove very defective. The history and traditions concerning objects of greenstone in the North Island ought to form the subject of a paper of a more poetical description than this, and ought to be collated with closer regard for chronology. Let me hope that I may have succeeded in inciting some North Island scholar to write it. My paper is rather a work of South Island research and observation. All this kind of work must be done soon, before the material dies with the dying generation of "authentic fellows." Let me express a hope, too, that I may excite such friendly criticism as will lead

to the correction of errors and the procuring of additional information. I shall be only too pleased to receive communications on this subject from any quarter. This applies to Europe as well as the Pacific, for I am almost wholly unacquainted with the literature which the “Encyclopædia Britannica “tells me exists on this subject. It is of too special a character to be found either in my native island, Aotearoa, or in Wai Pounamu, where my home now is, civilised as they both are.

Addenda.

Since the foregoing paper was read I have had an opportunity of examining the collections in the Colonial Museum at Wellington, and the Christchurch Museum. The Hon. W. B. D. Mantell and Sir Walter Buller have also afforded me ample opportunities of examining their collections, and I have also inspected several smaller collections: I append a few notes of these. I also append an extract of a letter from Mr. S. Percy Smith, the Surveyor-General of New Zealand, on greenstone in Polynesia; and a comparative set of analyses compiled by Professor Ulrich.

Sir Walter Buller's Collection.

1. Mere, 13in. by 4¼in. Broad-leaved. Opaque. Raukaraka, that is like kawakawa, but tinged with yellow (gelbgrün), like the karaka-leaf. The handle is, as is commonly the case, much more yellow. This mere belonged to the Waikato-proper Tribe, and came into litigation in connection with a block of land.

2. Famous mere, 12in. by 3 ¾in. Kawakawa-rewa. Slightly speckled with black. Name, Te Inu-toto (The Blood-drinker). This greenstone mere was the peace-offering of the Uriwera Tribe when Nga Korau and Te Kereru, with two hundred of their followers, came to Ruatoke in 1869 and made their submission to Major Mair, R.M., as representing the Government. The Major handed to one of the chiefs his gold watch, and placed a gold ring on the finger of the other in token of reconciliation. This peace-making was always referred to afterwards as the marenatanga or the marriage. It had been in the possession of the tribe for many generations, and had figured in many bloody affairs. Hence the name.

3. Mere, named Tuhwai. Is a portion of a large mere broken and worked into shape again. Length, 10in. Has no neck. The handle must have been broken off. This was the tribal property of Ngatiapa from time immemorial. They were originally in the Taupo country, and migrated to Rangitikei, on the West Coast, perhaps one hundred and fifty years ago. It is sometimes called Tuhiwai-iti, or the Lesser Tuhi-wai, in contradistinction from another Tuhiwai, the property of Ngatiapa, which was lost during a fight on the West Coast early in this century about 1812. The large mere was discovered ten years ago accidentally, in a forest near Porotawhau (Rangihaeata's old retreat, or stronghold). An old woman was collecting fungus in the forest when a mob of cattle was driven through. She ran away,

and saw some of the cattle stumble over an old tree-trunk which lay on the ground. When she came back she found the tree partly broken, and the long-lost mere exposed. Nga-tiapa redeemed it by paying this woman's tribe £200 in notes, five or six horses, and a lot of mats. The story of the losing of Tuhiwai is referred to in the following lament, composed by Puhara, a Rangitane woman of high rank, after the death of her husband. Sent to me by Sir Walter Buller:—

E hara te makau i te wai

Kawakawa koe

Wai kahurangi, e,

No te wai ano i tene ai

Whakare uta

I moe ai Tuhiwai, e,

E pa hiwi mai ra

I ara te tungaane

Kei te po tau au, e!

The Smaller Tuhiwai is inanga of a very green tint. It was presented to Sir W. Buller in. 1865, in connection with the sale of the Rangitikei-Manawatu Block, amid the firing of guns and the wailing of women. A curious discoloration on the edge is attributed to the oil of the decaying corpse when buried with it. A similar discoloration is seen on a mere in the possession of Mr. Kohn, of Wellington, which was found imbedded in the skull with which it was buried.

4. Remarkable mere, 12 ½in. by 3 ½in. It is a grey stone (graugrün) unlike any I have seen, known as Tuwhai Kowha's mere. A dull dense inanga, with curious green spots or blotches. It is not carved on the handle, and is bored with two crater mouths. It is most singularly flawed with two silky asbestos-like joints of considerable breadth and most beautiful lustre. This was one of the tribal weapons of the Uriwera, having been in possession of that people for many generations, possessing an individual history known to them, but not yet ascertained by the present owner. It is|especially interesting as having been used by the chief Tamaikoha at the killing of Mr. Bennett White at Opotiki, in 1865, as a declaration of war against the Europeans. His servant was killed with him. The act was a formal one, implying no ill-will against the victims.

5. Portion of a very small, narrow mere. Dark kawakawa. Dug up at Waitemata. Very ancient.

6. Beautiful handle-end of a very ancient mere of the Ngatiawa. Tradition says that it was broken in an action. The blade portion is in possession of Ngatiawa. It is a beautiful object, one side being pipi-wahairoa. A marked feature is the irregular crater-like countersunk holes.

7. Very large mere, 14 ½in. by 4 ¾in. Very wide and heavy. Named Te Maungarongo (The Peace-making), from some historical incident. Kawakawa, more spotted than usual, having a peculiar transverse vein of pure inanga and an oblique vein of raukaraka. It is from the Uri-wera (East Coast) country.

8. Hei-tiki. This remarkable object is of great antiquity, and was formerly in the possession of Ngapuhi, from one of whose burial-places at the Bay of Islands it was taken. It is of totoweka, of a singular colour. Its great singularity is that it represents a blind ancestor. All that the natives can say of it is that it is very ancient, as they have preserved no tradition respecting it. It has a hole in each corner of the mouth, which are drilled from the back, with craters behind. In style it is quite different from the ordinary form, having a long nose.

9. Very beautiful pale-coloured hei-tiki of the purest inanga, approaching white in colour. The hole in the back is drilled in a remarkable way in a long slant, and shows the marks of the stone drill in the form of circular grooves or rings. It is said to be very ancient, and has been in the possession of the Ngatikawhata Hapu of the Ngatiraukawa Tribe from time immemorial.

10. Large hei-tiki. Pure kawakawa of the finest quality, without flaw. Very highly polished by attrition against the skin.

11. Hei-tiki, said to be characteristic of some tribes which in carving a hei-tiki put a crest, perhaps representing a frown, on the forehead.

12. Pendant of clear tangiwai, perfectly translucent. Belonged to Aperahama Tipae, hereditary chief of Negahapa, a man well known throughout the North Island. The name of this pendant is Te Kahura-a-rongotea. It was handed over by that chief when he affixed his mark to the deed of cession of the Manawatu-Rangitikei Block. A very beautiful object.

13. A mat-pin, presented by the same chief to the late Lady Buller. Valued as a most perfect specimen of translucent tangiwai; delicately barred with varying shades.

14. A pendant. A perfect piece of ruakaraka (gelbgrün), given to Sir W. Buller by the Ngatituwharetoa of Taupo. They think this the most perfect stone.

15. A small eardrop of stone of the colour known as inanga, but transparent. Mr. Mantell has a pendant of similar stone. This is said by Ngatiwhiti to be the true kahurangi.

16. Very small hand-chisel or graving-tool for fine carving, used without a handle. Kawakawa. Two similar but smaller chisels to be struck with a hammer, broken at the haft-end.

17. Beautiful pendant of tangiwai, with the tear-drops in it. They are like globules of water in suspension.

18. Small ornament in the shape of a miniature axe, cut out of greenstone after the manner adopted by the Bosnians (Boyd Dawkins's "Early Man in Britain," p. 336).

19. Ear-pendant of blue tangiwai. This contains spots or stains, which are referred to by the Maoris as representing the blood of ancestors.

20. A small block of tangiwai, smooth all over. This is a burnisher for polishing wood-carving. This fact explains the existence of many

highly-polished stones of no apparent use found in Maori camps. A piece of pipiwarauroa, nearly square, ½in. thick, used for the same purpose. A small burnisher for the same purpose, with two scraping-edges, A long, thin burnisher for the same purpose.

21. Small chisel or axe, with a curved edge. A carving toki for digging the deep holes in totara slabs when executing carvings. The artist burned little holes in the slab, and chiselled out the charcoal. This instrument has a depression for the thumb.

22. Large axe. Length, 13in.; width, 3 ¾in.; thickness, 1in. As it was found to be too broad, there is a cut on each side to remove a strip. Kawakawarewa or melting kawakawa.

Greenstone in the Polynesian Islands.

41, Tinakori Road, Wellington,

6th November, 1891.

My Dear Mr. Chapman,—

In accordance with my promise of this afternoon, I send by book-post “La Nouvelle-Calédonie,” by Jules Garnier. See page 81 for the description of the greenstone, which is probably worth quoting as a note to your paper.

I also give you the following notes from my own note-book. They were jotted down at a time when I was—and still am—in search of anything bearing on the question as to whether the Polynesians knew of the pounamu:—

1. Taylor, in “Te Ika a Maui,” page 29, says, quoting from the “Voyage of the ‘Flores,’” “Green jade is found in New Caledonia (Kanala).” What is its native name?

2. It is also found in the Louisiade Archipelago.

3. Dr. Lesson, in his “Les Polynésiens,” vol. i., p. 59, says, “Le jade vert, à l'exception de la Nouvelle-Zélande, n'existe que dans les Îles Hébrides et la Nouvelle-Calédonie.”

4. He also says (vol. iii., p. 171), “Il paraît certain aujourd'hui quele jade vert ne se trouve sur aucune des îles Polynésiennes proprement dites. Cependant tous les anciens navigateurs ont signalé son existence sous des formes différentes, dans les divers Îles qu'ils ont visitées; tous ont fait re-marquer le prix qu'y attachaient les indigènes, preuve convaincante de sa rareté. On y tenait tant, lors des premiers voyages, qu'il etait presque impossible d'en rencontre dans les Îles Polynésiennes qui ont été fre-quemment visitées.”

5. Pounamu was known by name to the Moriori, and there was formerly a toki belonging to their ancestor Moe, of the Orepuke canoe, named Toki-a-ra-mei-tei, which is buried at Owhata, near the east point of Chatham Island, in the tuahu, or burial-ground. Tapu says, from the description of it, that it was made of pounamu.—A. Shand, 1890.

7. M. A. de Quatrefages, in his “Hommes Fossiles et Hommes Sanvages,” page 136, in speaking of the human and other remains found in southern France of the quaternary period, refers to the jade, or greenstone, found amongst the implements, as follows: “Mais toutes les haches recueillies dans la vallée du Petit Morin n'étaient pas en silex. Vingt ont été fabriquées avec des roches étrangères à la

contrée, et parmi elles il en est en jadite, en chloroménalite. Or, la première de ces matierères semble n'exister qu'en Chine, et peut-ĕtre en Ameérique, et notre éminent minéralogiste, M. Dumour, n'a pu encore découvrir la patrie de la seconde."

9. Julian Thomas ("Cannibals and Convicts," page 284) says, when in Tanna, of the New Hebrides, "I found specimens of a rock which I took to be the same as the New Zealand greenstone. The natives made charms of it, as in Maoriland."

10. Basil H. Thompson, in his account of explorations in the Louisiade Archipelago, given in Proceedings Royal Geographical Society,

1889, p. 540, says, "We could not ascertain the actual spot whence the 'greenstone' from which the stone adzes were made is brought; but, as the natives of Goodenough Island pointed westward, it is probably to be found in Huon Gulf. In New Zealand the greenstone is generally found associated with gold."

I have read most of the books relating to Polynesia, both in French and English, but so far have failed to find any reference to greenstone; and this is peculiar in face of Dr. Lesson's statement given in Note 4. I mean, I have failed to find any reference besides those given above. At the same time I feel little doubt that the pounamu has played an important part in inducing the early voyagers to direct their paddles towards New Zealand.

I remain, &c.,

S. Percy Smith.

The following is abbreviated from "Océanie. Par Jules Garnier. Paris, 1871":—

The geology of Ouen Island is extremely interesting. I recommenced my examination of the west coast. From Koatouré Bay I went up to the rugged summit of Nougougueto; which rose to may left. My attention was suddenly attracted to some rocks of peculiar appearance, which, besides presenting the features of novelty, exhibited that of beauty. They were somewhat translucent, of a very pure white, among which ran veins of a delicate green. Their physical character recalled tropical jade. It is of this stone that the New-Caledonians formerly made their finest' axes, the situs of which I had until now sought in vain. There was ample evidence that this was one of their ancient quarries in the fact that the soil was scattered over with débris, and with splinters which the hand of man

alone could have produced. Nevertheless the dull fractures indicated that a long time had elapsed since these heaps had been made; and the young men of Ouen Island, who accompanied me, regarded with as much astonishment as I did these traces of an ancient work of their ancestors. The reef of this beautiful stone is extensive. It crops out on the surface for a considerable distance, and its association with veins of euphotide, in which it appears to lose itself, seems to indicate that it is only a form of that rock. This fact is interesting, because hitherto the jades have been classed somewhat at random, not having been found in sitû.

On showing my specimens to Zachario he said, “That is the stone which was used for making axes. Formerly people came from as far as the Loyalty Islands to search for pieces. What sanguinary battles my ancestors have fought against strangers who have sought to invade the territory in search of that precious stone! In those days we had neither axes nor knives of iron or other metal. Nevertheless, we had to hollow out our canoes, cut up fish and the bodies of our enemies. For this purpose my ancestors sought out the hardest and toughest stones, polished and sharpened them. If all kinds became sharp, all did not take on a fine polish and a good appearance. Some remained black and dull, others were of a more or less bright green; but for richness of colour and transparency none approached the stone you have found to-day. Instead of being satisfied with making small hatchets of it, they turned to account the facility offered by that stone of breaking off thin slabs of large size at a blow. They chose one of those slabs, rounded its edges regularly, then polished its surface with coarse and fine sand until it became smooth and uniform. The thinner such an axe became the more it was prized, as the light of the sun could pass through it. By means of very hard, sharp pebbles several holes were then bored close together near the edge. By this means the handle was fixed to it. But what time was consumed in completing such a work! The lifetime of a man was not always sufficient to finish one. Thus such an axe was the most valuable possession of a chief. For one of these peace could be purchased, an alliance

secured, great canoes bought—in short, it was as gold is with you. Each chief owned axes such as that, and with them the bodies of the vanquished were cut up after a victory. The use of that stone did not stop there. Small fragments were rounded and pierced as beads, with which were made the necklaces you have noticed round the necks of the ladies of chiefs' families. But since your arrival your axes so sharp, and your brilliant necklaces, have caused us to forget our ancient arts, and that stone, once so precious, remains unused.”

M. Garnier with difficulty blasted out some large blocks, finding generally that his shots went off like guns instead of shattering the rock. He found it impossible to purchase even the small beads from the natives.

The axe described by Zachario must be similar to that in the Colonial Museum, at Wellington. It is a disc of greenstone, 8in. long by 6in. wide, very thin and highly polished. By means of two holes near the edge it has affixed to it a handle 20in. long, covered with tappa cloth tied on with a band of

sinnet. It forms a most formidable casse-tête, but not a useful tool. It is a dark green, of several shades intermixed, and with a brownish tinge. It is undoubtedly nephrite, and in New Zealand would be regarded as of a rare but not unknown colour.

At page 312 of M. Garnier's work, from which the above quotation is taken, in speaking of the people of Uvea, one of the Loyalty Islands, he says, “Most of them had ornamented their throats with necklaces of the green jade of Ouen Island. We essayed in vain to purchase some of these; our most brilliant offers failed to obtain a single one of the ornaments. It is always thus among the tribes of New Caledonia: if one wishes to possess one of these necklaces, one must purchase them bead by bead.”

New Hebrides Jade.

In the Colonial Museum there is also a small yellowish-green adze, possibly of jade, from the New Hebrides, and a very dark stone adze, similar in shape, from the same country. Besides these, however, there is from the same islands a pale greenstone axe with five transverse seams of black. This is unlike New Zealand stone; it is more like some I have seen from China. Its shape is characteristic of the New Hebrides, not of New Zealand. It is manifestly a jade of a different character from that found in New Zealand.

New Guinea.

The Colonial Museum also contains specimens of the very dark greenstone of which there are several fine specimens in the Technological Museum in Melbourne. I am unable to say whether it is an allied stone.