ART. 46.—*An Introduction to Maori Music.*

By JOHANNES C. ANDERSEN.

[*Read before the Wellington Philosophical Society, 19th July, 1921; received by Editor, 20th July, 1921; issued separately, 18th June, 1923.*]

Plates 83–85.

THE few references to Maori music in the writings of early voyagers and early residents in the country do not assist much in enabling a conclusion to be arrived at as to whether the Maori had any definite system of music —that is, whether music had with him become a conscious art. The appreciation of melody, except as mere accompaniment, was apparently in the earliest stages of its development: that is, the Maori did not consciously appreciate melody for its own sake—there was no tune existing separately apart from words. He appreciated a song chiefly because of what the words conveyed; the tune, or *rangi*, was altogether secondary.

There is nothing in early writings to help us to determine if the Maori was conscious of definite intervals, except the fact that tunes were known and remembered—tunes, too, that to European ears seemed destitute of melody. There is nothing at all to help us to determine if he was conscious of definite ratios between the intervals employed—to determine if he used any kind of scale.

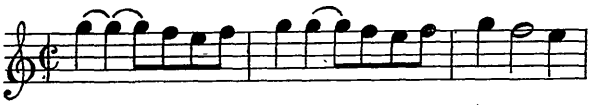
So little did Maori music, as a rule, appeal to Europeans that the great majority of writers declare that he had none. Most of them admit, however, that he had an extraordinarily keen sense of rhythm — rhythm in movement and in song. When a number of Maori are gathered together there is certain to be song, and the most casual listener can hardly fail to be impressed by the fact that rhythm is the element of greatest appeal. It does not enter into all the songs: some are quite without it, some have it in parts, some are rhythmical throughout. It is especially in the song accompanying the dance that the sense of rhythm is most manifested. There it is extraordinary in its perfection—extraordinary because so perfectly observed by a large number in unison. The rhythm is very often on the point of becoming metrical, and often actually is metrical.

It seems needless to quote, or even to refer to, the many unfavourable remarks on Maori music by the various early voyagers and visitors to New Zealand; they are too often quoted to be given fresh prominence here. One or two appreciative remarks may, however, be quoted to show that a very few were keenly alive to the fact that the Maori did possess a genius for music, even if that music was ill understood because so different from that to which the observers were accustomed.

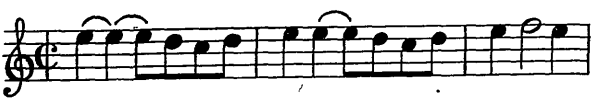
The following invaluable remarks were made by Forster in 1774, published in 1777 (vol. 2, pp. 476–78):—

"Peeterré returned on shore with his comrades in the evening, but came to sell us fish again the next day. We frequently heard him and the rest of the natives singing on shore, and were sometimes favoured with a song when they visited us on board. Their music is far superior in variety to that of the Society and Friendly Islands; and if any nation of the South Sea comes in competition with them in this respect I should apprehend it to be that of Tanna. The same intelligent friend [? Burney]

who favoured me with a specimen of the songs at Tonga-Tabboo, has likewise obligingly communicated to me another of the New Zeeland music, which will be sufficient to give an idea of the taste of the people. He did not visit the island of Tanna, but assured me that there appeared to be some display of genius in the New Zeeland tunes, which soared very far above the wretched humming of the Taheitian, or even the four notes of the people of the Friendly Islands.



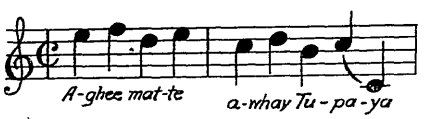
"Of this tune they continue to sing the two first bars till the words of their song are at an end, and then they close with the last. Sometimes they also sing an underpart, which is a third lower, except the two last notes, which are unisons.



"The same gentleman likewise took notice of a kind of dirge-like melancholy song, relating to the death of Tupaya. This song was chiefly practised by the inhabitants round Tolaga Bay, on the northern island, where the people seem to have had a high regard for that Taheitian. There is an extreme simplicity in the words, though they seem to be metrically arranged in such a manner, as to express the feelings of the mourners, by their slow movement.

ăgbēē, măttĕ ăwhāy Tūpāyă!*
Departed, dead, alas! Tupaya!

"The first effusions of grief are not loquacious; the only idea to which we can give utterance is that of our loss, which takes the form of a complaint. Whether the simplicity of the tune is equally agreeable, or well judged, is a question which I cannot pretend to determine. The connoisseurs in music must acquit or condemn the New-Zeelanders.



"They descend at the close from C to the octave below in a fall, resembling the sliding of a finger along the finger-board on the violin. I shall now dismiss this subject with the following observation, that the taste for music of the New-Zeelanders, and their superiority in this respect to other nations in the South Seas, are to me stronger proofs, in favour of their heart, than all the idle eloquence of philosophers in their cabinets can invalidate. . . ."

Cook's remarks in 1770 are of less value, because less detailed (vol. 3, p. 468): ". . . in their song they keep tune with such exactness that

*It is not known what is the significance here of the signs for long and short, – and ⏑, since the notes given are all the same length.

I have often heard above a hundred paddles struck against the sides of their boats at once, so as to produce but a single sound, at the divisions of their music. . . . A song not altogether unlike this [a war-dance and song] they sometimes sing without the dance, and as a peaceable amusement. They have also other songs which are sung by the women, whose voices are remarkably mellow and soft, and have a pleasing and tender effect; the time is slow, and the cadence mournful, but it is conducted with more taste than could be expected among the poor ignorant savages of this half-desolate country; especially as it appeared to us, who were none of us much acquainted with music as a science, to be sung in parts. It was at least sung by many voices at the same time. . . . They have sonorous instruments, but they can scarcely be called instruments of music: one is the shell, called the Triton's trumpet, with which they make a noise not unlike that which our boys sometimes make with a cow's horn; the other is a small wooden pipe, resembling a child's nine-pin, only much smaller, and in this there is no more music than in a pea-whistle.* They seem sensible, indeed, that these instruments are not musical, for we never heard an attempt to sing to them, or to produce with them any measured tones that bore the least resemblance to a tune."

It cannot be known how nearly the tune given by Forster reproduces the original—whether it actually does so or whether it merely gives the nearest notes of our scale: if the latter, it is, of course, practically valueless for the purpose of acquainting us with Maori music, since its distinguishing characteristic is lost.

Not until 1855 is the question of scale touched on at all. A letter by J. H. Davies, of Trinity College, Cambridge, "On the Native Songs of New Zealand," is printed as Appendix I to Sir George Grey's *Polynesian Mythology and Maori Legends*, 1855 (ed. 2, 1885). In this letter he analyses the Greek genera of scales, of which he notes three kinds—the diatonic, the chromatic, and the enharmonic. The diatonic genus consisted of a minor half-tone, a major tone, and a major tone ascending: this gives four notes, a tetrachord; and the tetrachord repeated gave the complete diatonic scale. This scale had a modification by which, while it retained the same semitone, it contracted the next tone and extended the last. The chromatic genus consisted of two tetrachords of semitone, semitone, and tone and a half. The enharmonic genus consisted of quarter-tone, quarter-tone, and two tones.

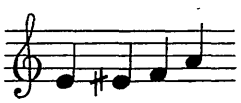
He supposed the enharmonic to be the scale used by the Maori, and he gives four tunes in enharmonic notation, making the following proviso (Grey, 1885, pp. 235–36): "I here beg to state that, though with great care and the assistance of a graduated monochord, and an instrument divided like the intervals of the Chinese kin, I have endeavoured to give an idea of those airs of New Zealand which I have heard, yet so difficult to discover the exact interval, that I will not vouch for the *mathematical* exactness; neither will I pledge myself not to have written a chromatic for an enharmonic interval, or *vice versa*. I must also, in justice to myself, add, that the singer did not always repeat the musical phrase with precisely the *same* modulation, though without a very severe test this would not have been discernable, nor then to many ears; the general effect being to a European ear very monotonous. . . ."

* The instruments referred to would appear to be a *pumoana* and a *nguru*: no mention is made of the *koauau*.

Mr. Davies's essay is much fuller in the first edition than in the second.

Whilst the singer may not always use exactly the same modulation, the Maori are quick to detect any slight deviation from the recognized tune. The writer has heard two singers rehearsing a song, to be sung in unison. Quarter-tones were used freely; and more than once one stopped the other, saying, "No; that's not quite right"—when the phrase would be repeated, the difference being hardly, if at all, discernible to the writer, though the Maori would say, "Yes, that's right," on the phase being sung to his satisfaction.

It must be remarked that the notes of the songs given by Davies do not all conform to the enharmonic scale, the lower tetrachord of which, on the tonic A, is as under:—

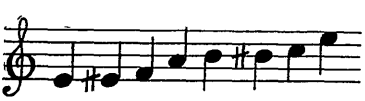


The various accidentals employed in the notation of Maori music are represented by the following signs, of which those marked half-sharp and half-flat are the ordinary sharp and flat of European music:—

𝄲 = quarter-sharp; ♯ = half-sharp; 𝄳 = three-quarter sharp;

𝄬 = quarter-flat; ♭ = half-flat; 𝄫 = three-quarter flat.

In the full scale, built of two tetrachords—the Dorian enharmonic scale—a tone separated the highest and lowest notes of the respective tetrachords:—



It will be seen that in the songs recorded by Davies the wide intervals may contain intermediate notes, and that consequently the scale, whilst it may be enharmonic, is not the Greek enharmonic scale. Both the chromatic and enharmonic scales were eventually supplanted by the diatonic. In Maori music there are, as a rule, few wide intervals, and quarter-tones enter freely in all parts of the melody. Maori music resembles Greek in the following respects: instrumental music was mainly an accompaniment of the voice; the rise and fall of the melody corresponded more or less with the natural tunes of speech; harmony, if present, was quite rudimentary.

The writer, after hearing many Maori songs and many pakeha-Maori songs, came to the conclusion that there was only one way by which the scale employed by the Maori of old, if any were employed, might be detected. There was at least one musical instrument in common use among the old-time Maori upon which definite intervals were produced—the *koauau*. As it has been repeatedly said by the Maori that there were no tunes without words, presumably the intervals on the *koauau* would correspond with the intervals used in singing.

The *koauau* was an instrument of the flute kind, and was made of wood or bone (see Plate 83, figs. 1, 2, 3, and Plate 85, figs. 1–4). Like the flute, it was pierced on the side with holes, in number from one to six,

the most usual number in instruments that have been preserved being three. The great difference between the *koauau* and the flute is in the method of producing the sound. The present-day flute has the embouchure, or hole to which the lips are set, in the side, and the breath is blown across the flute, the hole at the top being plugged. The *koauau* was like the Egyptian nay in having both ends open and in having no side embouchure, the sound being produced by blowing across the open upper end. Polack says of their flutes ". . . the sounds elicited from them are very unharmonious. They differ in shape and size, some possessing three, four, and five holes, to emit the sound, and are generally worn round the neck . . ." He gives five roughly-drawn figures (Polack, vol. 2, pp. 172–73). Cruise, however, notes (pp. 211–12) that "two chiefs came on board; one of them wore a carved flute, or pipe, round his neck, upon which he played the simple but plaintive airs of this part of the island, with much correctness." (*See* Hamilton, fig. 1, pl. 57, p. 417; fig. 6, pl. 58, p. 419.)

The writer has met with no Maori able to produce music from the *koauau*, and has never seen a *koauau* in the possession of a Maori. It was only by repeated experiment that he was able to sound some of those in the Dominion Museum collection; many of the small bone *koauau* have remained obstinately mute. In April, 1923, he heard a Maori air played by an aged man, Iehu Nukunuku, at Waiomatatini. The flute was not a *koauau*, however, being made from a piece of gas-pipe about 12 in. long, the three holes being at the lower end. The sound was produced in the way learned by experiment, save that the Maori blew sideways across the opening instead of directly. He did not use the natural low-sounding notes, but the octave above, as in the English pipe; and, whilst sweet in sound, the mellowness of the wooden *koauau* was absent. The opportunity has been taken for inserting this and other information obtained since the reading of the paper.

Seeing that the English pipe has but three holes, and is blown from the end, it was thought that, as the scale is produced on the pipe by overblowing and cross-fingering, so it might be produced on the *koauau*. The writer has been unable, however, to overblow the *koauau*; it will speak only in its natural notes: the pipe, which is much longer than the *koauau*, the holes being towards the extreme end, speaks in the upper octave. No octave can be produced on the *koauau*; six consecutive notes comprise its compass, the range being no more than two and a half tones. Moreover, there is great diversity in the size and shape of the *koauau*—so great that it is difficult to see how any uniformity of sound could have been obtained from the various kinds. They differed in length and the shape of the bore, in the number of holes, and in the distances between the holes as well as in the size of the holes. Some had a hole at the back as well as those in the front. Colenso writes, "Those for the mouth were differently formed from those for the nose," but does not say in what way they differed.

Whilst at Rotorua in April, 1920, the writer was with one of the *kaumatua*, or elders, of Ohinemutu—Kiwi-amohau—and from him, through Mr. Elsdon Best, obtained some particulars as to the construction and playing of the *koauau*, though the instructor was himself unable to produce music from the instrument.

Usually, he said, the *koauau* was the length of the forefinger; and when the lower end was pressed down against the extended thumb and laid along the forefinger the top hole was opposite the top joint of the finger, the second hole opposite the second joint, and the third opposite

the third joint—approximately at the junction of the line of life and the line of head. So far as concerned the *koauau* we had with us, the position of the holes agreed fairly well with the finger-joints, as he said; but reflection must show that this arbitrary method of measurement would necessarily result in irregularity: forefingers differ in the proportions the phalanges bear to one another; and even did they not differ, this means could apply only to the *koauau* of three holes. On being asked if there were definite recognized proportionate distances between the holes he said No; the fingers first told in playing if the holes were in the correct positions, then the ear told if the notes were correct in sound. (More must be said of this later.)

The general term for the holes was *wenewene*. In playing they were either quite covered or quite uncovered; there was no half-covering to produce intermediate notes. There were none but the four simple notes produced by means of the three holes. The top hole was *te mea whakangawari* (the means of softening the sound); the middle hole was *te mea whakakaha* (the means of strengthening the sound); the bottom hole "corrected" the sound of the others—whatever that might mean. Playing the notes in sequence up and down was called *kai hi*. There was no hole at the back, except occasionally a hole through a lug for suspension of the *koauau* round the neck; always three in the front, except in the nose-flute, which had an extra large hole for the nostril just below the top. In the nose-flute the three holes were smaller.

The *koauau* we had brought to Rotorua was conical in bore, the narrower part downward. This, he said, was intentional; "that is why it sounds well." The size of the end apertures bore no definite ratio one to the other—that is, no measured ratio—"the eye of man controlled these things."

Human bone made the best *koauau;* its sound was better. When wood was used, it was generally *whau* (cork-wood: *Entelea arborescens*).

Two or more flutes might play in concert, but always in unison; or three like instruments might similarly play together—the *koauau*, the *putorino*, and another whose name he had forgotten. All played the same tune, but each had its special quality of tone.

All tunes had words; there were no tunes without. One or more people might sing to the sound of the *koauau*, but softly, so that the sound of the instrument might not be lost, and the words and the sound of the flute both be heard. The tune played in unison by Tutanekai on the *koauau*, and by his friend Tiki on the *putorino*, conveyed certain words to Hinemoa, telling her the course of action she was to adopt in leaving her people and coming to him across the lake from Mokoia. Kiwi said that no person then living at Ohinemutu had seen the *putorino* played, and no one now heard the *koauau*. Captain Mair, living in the same village, said that about dusk, from almost every house in the *kainga*, could be heard the soft sounds of the *koauau*; "but that was long ago," said he; "now you never hear it at all." It was dusk as he spoke—a romantic hour at that romantic spot: the island Mokoia shadowy in the distance across the glimmering lake, and musical Maori voices and laughter coming from the neighbourhood of the many steaming pools and springs. Instead of the sounds of the *koauau*, the writer more than once heard, in the evenings, the sounds of its supplanter, the brass fife.

The particulars obtained from Iehu Nukunuku correspond in some respects with those obtained from Kiwi-amohau. The *koauau* was the

length of the forefinger. The position of the lowest hole was at the tip of the forefinger when that finger was laid on the flute, back upwards, so that the end of the flute touched the second joint. The finger was then pivoted on its tip until its back rested on the flute; the first joint then showed the position of the second hole, the second joint that of the top hole. The top hole was the width of the thumb from the top aperture. In the nose-flute (the *koauau whakatangi ihu*) the top hole was the width of the forefinger from the top aperture; the second the width of the thumb from the first; the third the width of the first and second fingers from the second.

The *koauau* was usually played in the evening, the experts often sitting on a special platform, where mats (*whariki*) might be spread for them, the people sitting round about the platform listening. Should a player start his music at night when the people were asleep, any one waking up would stay awake to listen, because the sounds were so pleasing to the ear. Iehu agreed that there was no tune without words; as he put it, "there was no aimless playing of the *koauau*." When he himself played, a note was sounded for every syllable, so that one could almost hear the words, "especially," as one remarked, "if you knew the song."

Much of this information was obtained without questioning, the old man being a storehouse of lore, and very clear in his remarks. Another elderly man, Riwai Miringaorangi, remarked that the three holes, counting from the top, were known as Maui-mua, Maui-roto, and Maui-taha—three of the Maui brothers. Te Rangitaotahi was a famous player of the Ngati-Porou of the olden time; he lived perhaps twenty generations ago.

The *koauau* was made also of *tutu* or *houhou*, the hole being made by laying a red ember on the central pith, and gently blowing, causing the ember, renewed from time to time, to sink through the wood.

The sound of the *koauau*, when played either with the breath of the lips or the breath of the nose, carried to a considerable distance, for all its softness. The distance between the home of Hinemoa, on Mokoia, and Tutanekai, on the land-shore of the lake Rotorua, was about a mile and a half, and at Hiruharama, or Jerusalem, on the Wanganui River, the writer was told that the sound of the *koauau* could be heard as far as Aorangi—an old pa, of which now nothing remains but part of the trench and earthworks and a few lonely graves—on the top of a hill a mile distant down the river.

Kiwi-amohau said that Tutanekai played the *koauau* whilst Tiki played the *putorino*. Grey reverses this, however: "*Ka huihui raua ko tona hoa ko Tiki, na he putorino ta Tutanekai, he koauau ta Tiki*" ("Tutanekai and his friend Tiki sat together, Tutanekai with a *putorino*, Tiki with a *koauau*") (1885, p. 128, Maori part). When Hinemoa asks him what is to be the signal for her coming to him, he says, "The sound of the *pu*." "*Ka mea a Hine Moa, 'He aha te tohu mo taku haerenga mai?' Ka mea a Tutanekai, 'E tangi he pu i nga po katoa, ko ahau tena, hoe mai.'*" ("Then said Hinemoa, 'What shall be the signal for my coming to you?' Then said Tutanekai, 'The sounding of the *pu** in the nights; that will be I; paddle to me'" (p. 129). Later on it says, "*Na, no te turuawepo, ka piki a Tutanekai raua ko tona hoa ko Tiki ki runga ki te raua atamira; i reira ka tango tetehi ki te torino, ko tetehi ki te koauau*" ("Then in the quiet night Tutanekai and his friend Tiki mounted to their platform; there the one played on the *torino*,

* *Pu* (? short for *putorino*): Williams gives *pu* as meaning pipe, tube, flute.

the other on the *koauau*" (p. 129). Hinemoa heard the sound, and, since the canoes had all been drawn high up by her suspicious people, she started to swim towards the island whence it came. She rested, when "*ano te rangi o te koauau a Tutanekai*" ("again the melody of the *koauau* of Tutanekai" (p. 130), where Tutanekai is given the *koauau* instead of the *putorino*—unless it simply means that the composite sound of both instruments was regarded by her as coming from Tutanekai. Even then there is a suggestion that it was the *koauau* that produced the melody; and the suggestion is of value.

The writer, through Mr. Elsdon Best, questioned Iehu regarding the two instruments used, and he remarked that it was Tiki who played both; Tutanekai was not able to play either. This was a ruse adopted in other instances: so much was a player on the *koauau* appreciated that a lover would sometimes charm his mistress by proxy. Sitting in the dusk or dark, the player would be beside him; but should the fire brighten the playing would cease. No doubt some unpleasantness might follow when such wooing proved successful. Iehu said that Tutanekai gave his sister to his friend as a reward for his services. This is not given as the reason in the tale, and no doubt the Arawa would have something to say on the subject.

It is difficult, however, if not impossible, to gather fact from legend, and it is perhaps indiscreet to attempt to do so. It is equally difficult to separate fact from fiction in information concerning matters of this kind derived from living men.

The *koauau* upon which the details above were based happened to have a conical bore, the holes happened to coincide with the finger-joints, and the length happened to be the length of a forefinger. The flute is, however, modern; many, modern and old, do not conform with the requirements above as regards bore, length, or distance between the holes. Nevertheless, *koauau* are known in which one or more holes, when pierced, have failed to please the ear of the makers, for they have been plugged, and others pierced. Details of two are given below. These "attempts" prove two things: firstly, that there were no recognized definite distances between the holes, or at least that were there such they were unknown to the makers of the altered flutes; secondly, that there were certain intervals that pleased the ear, certain that displeased it. The conclusion appears to be that the Maori was "feeling" for the intervals, unconsciously it may be, as he was feeling for melody. When a *rangi koauau* was composed, the *rangi*, or air, would evidently have been made to conform with the intervals of a certain *koauau*; it is evident that the intervals on the *koauau* were not made to conform to definite intervals of singing, since the intervals on the various *koauau* do not correspond. On the other hand, it must be noted that in wooden *koauau* the first and second holes are relatively much closer than the second and third, as if some proportion were observed, even though such proportion were indefinite.

There is a fine carved *koauau* in the Dominion Museum, Wellington (Plate 83, fig. 1). It is in the shape of a double-headed phallus, and is undoubtedly old. On showing it to old Maori men they take it, look at it closely, glance at one another, and remark as they hand it back, "That is an old one." The measurements of this *koauau*, which gives a clear, mellow note, are as under. The outside diameter is perhaps of no significance, though it may be remarked that in a spurious *putorino* bought in London and now in the Dominion Museum the sides are so thin

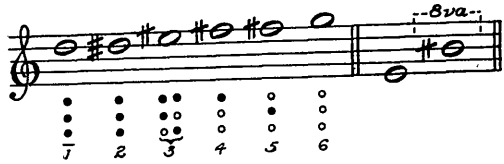
that they vibrate strongly, whereby the quality of the note must be affected. The piercing of three additional holes has been begun, evidently at a comparatively recent date: the top one is barely begun; the bottom two have penetrated only a short distance into the thick wood; so that the three original holes are fortunately the only ones through which the instrument speaks. The distances of the holes from the top of the instrument are given below, also those of the holes commenced, and the distances between the holes.

1. *Koauau* in Dominion Museum, No. 1679.

Length, 194 mm.; diameter, 45 mm.; bore—top 20 mm., bottom 22 mm.

			Distance from Hole above.
From top to	1	29 mm.	
1	2	53 mm.	24 mm.
2	3	76 mm.	23 mm.
3	4	113 mm.	37 mm.
	5	145 mm.	32 mm.
	6	165 mm.	20 mm.

The larger numerals are the speaking holes; the small include the holes partly pierced. The two diameters would appear to indicate that the bore is slightly conical, the wider end being at the bottom; but, as the lower opening is slightly belled, the bore is practically uniform through nearly the whole of its length. The following notes are obtainable:—



It is very difficult to be absolutely sure of the intervals, for the reason that the pitch may be varied through the interval of a tone according as the blowing is more or less transverse; the pitch is lowered if the blowing is less transverse—that is, if it is more directly down on the edge of the tube than across it. The blowing is changed as the aperture is more or less covered by the lower lip. The above pitch was taken on a pitch-pipe, but the actual pitch of any particular note is not so important as the actual interval between the various notes. The first note, D, is obtained by covering the three side holes and partially covering the aperture at the lower end with the little finger. This partial covering will also flatten any note sounded. The second note, D ¾ sharp, is obtained by removing the little finger from the lower aperture, but keeping the three side holes covered; the third by keeping the upper two holes covered; and so on, as in an ordinary unkeyed flute or fife. In the fingering indicated above the dark circles are covered holes, the open circles uncovered holes; the stroke beneath the first indicates the little finger across the lower aperture. The first note and the fifth would possibly not have been used; on other *koauau* the fingerings 4 and 5 produce the same note, 5 being, perhaps, the slightest shade higher than 4. It would nevertheless be natural for a player to extend the range of the instrument by any means in his power.

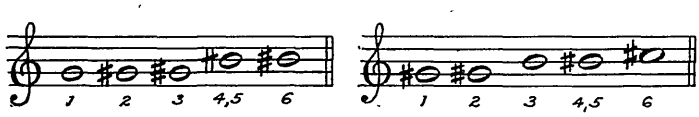
The six notes cover an interval of two and a half tones. Intermediate notes may, of course, be obtained at any time by only partially covering the holes, or more easily by blowing more or less transversely—it is, indeed, difficult to avoid a slight sharpening or flattening of a note in the transverse blowing. The two notes following the six are produced by blowing with all holes covered, and the lower aperture also closed with the palm; the second note is overblown, and it is only by closing the lower aperture that the *koauau* can be overblown at all. The overblown note is the same if all the side holes are covered or if the two lower ones are uncovered; it is raised if all three side holes are uncovered. These two notes would never be used in ordinary playing.

This particular *koauau* has been selected for examination because of its undoubted age and genuineness. The dimensions and notes of more modern *koauau* are given for comparison:—

2. *Koauau* belonging to Ven. Archdeacon H. W. Williams.

Length, 146 mm.; bore—top 22 mm., bottom 16 mm.

		Distance from Hole above.
1	20 mm.	
2	41 mm.	21 mm.
(Trial)	79 mm.	
3	88 mm.	47 mm.



3. *Koauau* in Otago University Museum, No. D 21/58.

Length, 151 mm.; bore—top 17 mm., bottom 16 mm.

		Distance from Hole above.
(Trial)	27 mm.	
1	32 mm.	
(Trial)	52 mm.	
2	58 mm.	26 mm.
(Trial)	65 mm.	
3	94 mm.	36 mm.
(Trial)	100 mm.	

These two are of particular interest because they have plugged trial-holes, showing that the maker was not satisfied with the intervals first obtained. In 2 (Plate 83, fig. 2) there were two trials for the lowest hole; in 3 (Plate 83, fig. 3), there were two trials for both the top hole and the lowest, and three for the middle hole. *Koauau* 2 is shown to be modern, apart from the fact that it is known to be so, by the plugging of the trial-hole with sealing-wax. Over the top and middle holes small pierced circles of *paua* shell have been countersunk. *Koauau* 3 looks modern, and the intervals, after the repeated trials shown by the plugged holes, approach those of the European scale. No diameters are given for these two, as they are torpedo-shaped.

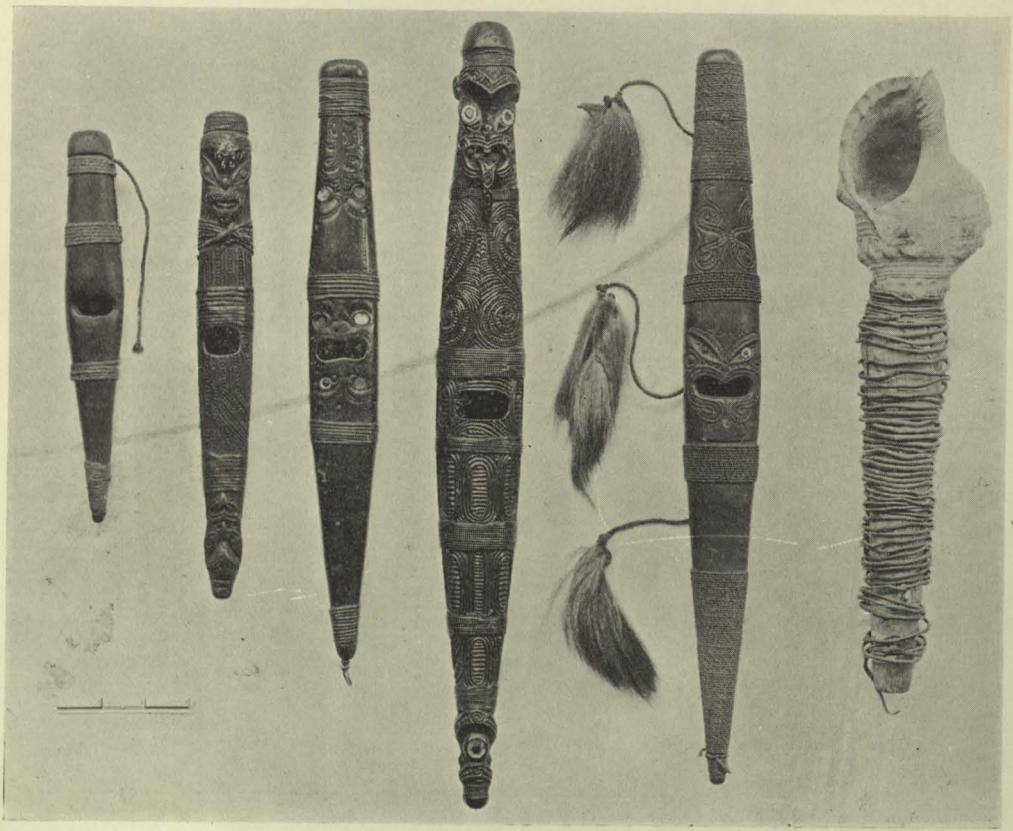
One of the *koauau* in the British Museum, (Plate 85, fig. 1) shows two plugged trial-holes.

1 3 4 2

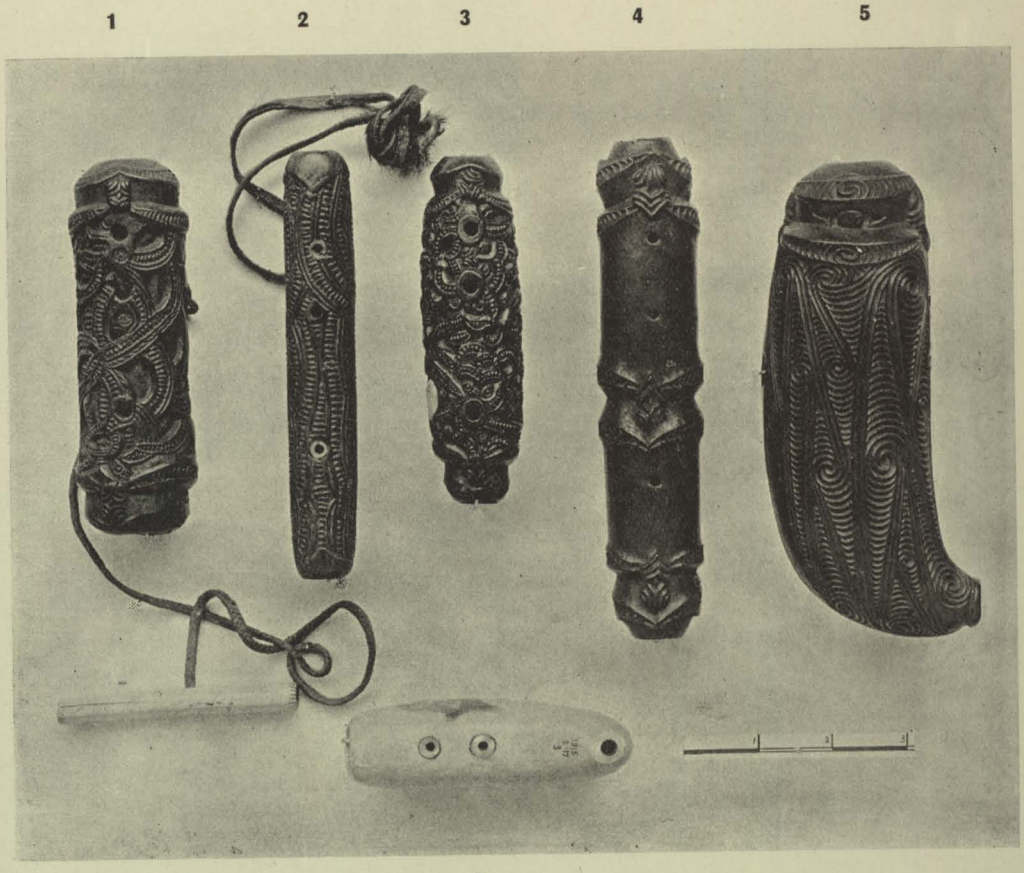
[*Photo. J. McDonald.*

FIG. 1.—Wooden *koauau* in Dominion Museum, Wellington.
FIG. 2.—Wooden *koauau* in possession of the Venerable Archdeacon H. W. Williams, Gisborne
FIG. 3.—Wooden *koauau* in Otago University Museum, Dunedin.
FIG. 4.—Bone *koauau* (?) in Otago University Museum, Dunedin.

Face p. 752.]



FIGS. 1–5.—Wooden *putorino* in British Museum.
FIG. 6.—*Pumoana* in British Museum.



FIGS. 1–4.—Wooden *koauau* in British Museum.
FIG. 5.—Wooden *nguru* in British Museum.
FIG. 6.—Bone *koauau* (?) in British Museum.
FIG. 7.—Stone (?) *nguru* in British Museum.

Taking the old *koauau*, No. 1, as a standard, then supposing Nos. 2 and 3 to be made the same length, their holes should be separated by the distances below :—

Hole	No. 1.		No. 2.		No. 3.	
	Mm.	Difference. Mm.	Mm.	Difference. Mm.	Mm.	Difference. Mm.
1	53	..	27	..	41	..
2	76	23	54	27	75	34
3	113	37	117	63	121	46

Or, supposing the holes to be pierced at the same proportionate distances in *koauau* Nos. 2 and 3 as in No. 1, they should be as under :—

Hole.	No. 1.	No. 2.	No. 3.
1	53	40 instead of 20	41 instead of 32
2	76	57 „ 41	59 „ 58
3	113	85 „ 88	88 „ 94

The one point of similarity is that holes 1 and 2 are nearer together than holes 2 and 3. There can be no agreement of intervals in the tone when the intervals between the holes are so divergent. It is probable that, as different people pick out different colours in the spectrum as more pleasing to their eyes, so different people pick out different tones in the harmonics as more pleasing to their ears : this is evident from the fact that different scales are adopted by different peoples ; nor is any disadvantage obstrusive until the sense of harmony is awakened, when harmonic colour is gained only at the expense of melodic colour.

It is possible to play some of these *koauau* as nose-flutes ; the Ven Archdeacon Williams tells me that No. 2 above was so played by the old man by whom it was given to him. The *koauau* is held with the hole at the top end closed by being pressed against the upper lip, so that the first side hole is under the left nostril. The right nostril is closed with the right thumb, and the top hole practically becomes the embouchure of a temporarily transverse flute. The sound produced is, however, feeble, and I do not think that the *koauau* was generally used in this way as a nose-flute—in most instances the perforation of the holes would not allow of it. Old illustrations are unsatisfactory. These usually represent the nose-flute as much longer than the *koauau*, and the blowing appears to be directly into the tube, not across, as in the *koauau*.*

In the bone flutes the three holes are usually the same distance apart. Here again three is the usual number of holes, one near the top being used for suspension ; and whilst this hole is usually at the side, out of the line of the three sound-holes, it is at times in the same line. There is a beautiful little example of a bone flute from the John White collection in the Otago University Museum (Plate 83, fig. 4). It is only 115 mm. in length, and the original three holes are respectively 31 mm., 48 mm., and 67 mm. from

* See illustration in Jules et Édouard Verreaux, *L'Oceanie en estampes*, p. 314; Paris, 1832. See also various references in Hamilton, p. 386, footnote.

the top end. Three additional holes have been pierced, at 34 mm., 58 mm., and 76 mm. from the top. The later-pierced holes can easily be distinguished from the others, being smaller and out of line; but it is impossible, except for a child with the slenderest fingers, to stop these holes, so close together are they. I have repeatedly endeavoured to sound this flute, but it and all those of bone, with the three equidistant holes, have completely baffled my attempts to sound them: I can get no more than a whistling suggestion of what the notes may be. There is, however, as much diversity in the proportions of the bone flutes as in the *koauau*.

No help may be had from the *putorino*, or *torino*, or *pu*. This is also a flute-like instrument, much longer and larger than the *koauau* (Plate 84, figs. 1–5). Its bore is irregular, swelling in the centre, and contracting at either end, the lower end being much smaller than the upper. In order to make the cavity in this instrument, the outside was first shaped, when the wood was split into equal halves, and the two halves hollowed out canoe-fashion. The two pieces were then fitted together again and lashed with flax cord or finely divided vines. It is played by blowing bugle-fashion into the larger end, the sound being modified by moving the fingers or the hand over the single large central hole or over the very small end hole. The central hole is large, and is usually shaped like an elongated figure of eight, the corners at the waist approaching but not meeting. This instrument, like the *koauau*, is often highly ornamented with carving, the central hole being made in the representation of a grotesque open mouth—a humorous touch. The humour is grim when it is seen that the contraction of the mouth at the middle resembles the contraction seen in dried heads. If the head were that of an enemy, the lips were allowed to open as they shrunk, leaving the teeth exposed: if it were the head of a friend or relative, the lips were usually sewn together and kept closed. At times the only sewing was at the middle, when on drying there was an opening on either side of the central constriction. The opening of the *putorino* often resembles such a mouth, one of which is perfectly illustrated at p. 145 of Robley, *Moko; or Maori Tattooing*.

No definitely graduated series of notes can be produced on this instrument, which is therefore of no value for the purpose of detecting any scale that may have been used. Iehu Nukunuku said that it might be played with the *koauau*, but it only made a deep booming or murmuring sound, which trembled as the fingers were moved, not lifted, over the opening; the sound was likened to the bubbling of water into a calabash held under the surface, as is seen in the saying, "*Me te wai e utuutu ana.*" The sound was also varied by the finger closing the hole at the small end. (*See* Hamilton, figs. 1, 4, pl. 58, p. 419, and fig. 1, pl. 59, p. 421.)

A third flute-like instrument is the *nguru*, made of wood or stone (Plate 85, figs. 5, 7). It was used rather as a signalling than as a musical instrument, and its sound was said by Cook, as noted above, to be no more musical than that of a pea-whistle. He likens its shape to a child's ninepin; Banks likens it to a tobacco-pipe. Colenso (1881, pp. 80–81) calls it a whistle: "Their whistles were very large; that is, thick, obtuse, peculiarly shaped, and something like a short thick tongue, some being a little curved. They were made of hard wood, scraped, polished, and profusely carved, and inlaid with mother-of-pearl; these also were worn by the chiefs, hung to their necks. Parkinson (Sir Joseph Banks' draughtsman) has given a drawing of one in plate 26 of his interesting 'Journal,' figure 24;—in describing it he says: 'A whistle made of wood having the outside

curiously carved; besides the mouth-hole they have several for the fingers to play upon. These, which are worn about the neck, are 3½ inches in length and yield a shrill sound.' I suspect that these, like their trumpets, were not used for obtaining any proper tune, but only for the purpose of making a loud call,—as from a chief to his followers." (*See* Hamilton, fig. 2, pl. 58, p. 419; and p. 225.)

Of their trumpet, *putara*, Forster says (vol. 1, p. 227): "They also brought some musical instruments, among which was a trumpet, or tube, of wood, about four feet long, and pretty straight; its small mouth was not above two inches, and the other not above five inches in diameter; it made a very uncouth kind of braying, for they always sounded the same note, though a performer on the French horn might perhaps be able to bring some better music out of it. Another trumpet was made of a large whelk (*Murex tritonis*) mounted with wood curiously carved, and pierced at the point where the mouth was applied; a hideous bellowing was all the sound that could be produced out of this instrument." (*See* Hamilton, pl. 30, fig. 1, p. 245.)

The shell trumpet, *pumoana* (Plate 84, fig. 6), Colenso (1881, pp. 78–79) says was made from the shell of *Triton australis*, its apex cut off, and a mouthpiece of wood lashed on. A method of increasing, or modifying, or altering the sound in some way was adapted by the insertion of a thin piece of hard wood "of a broadly elliptical form, and measuring 5 × 3 inches, most dexterously fitted in to fill up a hole in the upper part of the body or large whorl of the shell," only one sort of wood, *kaiwhiria* (*Hedycarya dentata*) being used for the purpose.

Though not an indigenous musical instrument, the jew's-harp was introduced very early, and quickly became a favourite. It had its prototype in the *roria*, an instrument which simply consisted of a thin strip of the outer casing of the supplejack-vine, about 3 in. or 4 in. long and ¼ in. wide. It was held between the teeth, and sprung with the finger, the sound of the vibrating strip being modified by varying the opening of the lips. The name *roria* was later applied to the jew's-harp itself. Of this latter instrument Colenso writes (1881, p. 82): "It is well known that at an early date, say, forty years ago, the Maoris showed a great desire to obtain jew's-harps: this was common. But to see them . . . critically examine and try a whole score, or more, of those little instruments, before one was found that was 'soft' enough (or suitably melodious) in its twang to please their ear! I have known them to leave the store where jew's-harps were sold without purchasing one after trying many, though sadly in want of one at the time, rather than bring away a 'hard' or unsuitable one. They also spent much time in endeavouring to alter its tone, by trying all manner of schemes and plans with its tongue. Again, in later years, I have known them to improve on the sound of the jew's-harp (for their ear), by fixing a lump of sealing-wax, or *kauri*-resin, on the projecting end of the tongue of the instrument, for the purpose of playing the same *within their mouth and with their tongue*, instead of with their finger! This certainly rendered the sounds much softer than when played in the usual way. Young men would sometimes be thus occupied for one or two hours, evidently delighting themselves with the dulcet sounds."

To those who know the jew's-harp only as a toy these facts may again suggest a poorly developed musical taste in the Maori. The instrument is capable of producing tunes, and really beautiful effects, and there is no doubt that the Maori perceived at least some of these. The writer learned

from Mr. H. Stowell, however, that there was quite another reason for the Maori partiality to the jew's-harp. Any one who has experimented with it knows how, by altering the shape of the mouth-cavity and the position of the lips, it is possible to produce most varied vocalizations; and the Maori discovered that he was able actually to speak through the instrument—that is, the vocalizations could be made to approximate the sounds of speech. Definite songs would be composed for the instrument; and Mr. H. Stowell has told me that, after the song had been played two or three times over, the listeners were able to repeat the words intended by the player. This might not be so very difficult in Maori, where vowel sounds preponderate so largely. It was not, then, the *music* of the jew's-harp that appealed to the Maori, but its capability of speech. I learned from Mrs. Ngata, wife of the Hon. A. T. Ngata, M.P., of Waiomatatini, that when she was a girl lovers might be seen sitting side by side, heads close together, each with a jew's-harp, known as *kukau*, speaking to each other very softly on the instruments, one hand covering the instrument and the mouth.

In bird-song, too, it was the song that approached nearest to vocalization that appealed most to the Maori. This is one reason why the tui was such a favourite; his short phrases of song were so often short phrases of speech; he was continually saying something, and to the ear of the Maori that something was often of a humorous nature. The writer has repeatedly observed this fact, and in many of the notes of birds, tui and other, recorded by him, vocalizations are given, and these often resemble a short phrase of speech, which very little imagination renders quite definite. The writer has heard a phrase that immediately suggested a short sentence of six Danish words; and Maori words are much more easily discerned in the vocalizations. So far as the writer has observed, the Maori now pays little attention to bird-song that is not capable of vocalization. He has more than once been near bush with Maori friends, and hearing a miromiro, or rironiro, or piwakawaka, or other small bird, he has asked, "What bird was that?" "Where?" the reply has been, whilst the eyes ranged round; they had not heard the notes—at any rate, were not conscious of having heard them. Or, on drawing their attention to the notes whilst still sounding, they would say, "Oh, I suppose it is a so-and-so," as often as not naming quite another bird than the one singing. In fact, their appreciation of melody, as melody, was undeveloped, though it is evident it was near emergence. This is made clear by the many suggestions of melody, not merely of speech-tune, in their songs—and still more by their unhesitating adoption and enjoyment of European tunes. Their sense of harmony, too, must have been near emergence, and the writer has had experience of their quickness in harmonizing a tune. He wrote a song with a chorus in $\frac{3}{4}$ time, and one evening six or eight young people were in the room and wished to learn the song, singing it over with the writer; and when it came to the chorus they harmonized it while they learned it; one youth was especially apt at the harmonizing.

The song of the cicada, too, was liked, but principally because it sounded in midsummer, the time of warmth and plenty. It has little melody, but fine rhythm. A Maori poet at one time was inspired by the rhythm and characteristic vocalization, and on his writing a *haka* song based on these it immediately became a great favourite. It appears later on in this paper.

As regards the sound of the *putara*, the long wooden trumpet, it was more appreciated because its vocalization permitted of insulting words being blown at the enemy. (Colenso, p. 80, note (1).)

The songs of the Maori were exceedingly varied in character. On going over the extensive catalogue of names of different kinds of songs it is seen they were used on every possible occasion—in games and in religious ceremonies, in sickness and in health, in sorrow and in happiness. The names are not applied in any definite manner; there are several general names, but many songs included under one may equally well be included under another. The term *karakia* covers an enormous field; it includes all ritual chants, from the most sacred to the most ordinary, also charms or spells of all kinds. A *karakia* was usually intoned in monotone, much as our own church ritual may be intoned. There were all manner of sub-divisions of the class *karakia*—such as *kawa*, including ritual chants in connection with new houses or canoes, birth of a child, &c.; *kaha*, a general term for charms used when fishing, bird-snaring, &c.; *matapuru*, a class including charms to ward off witchcraft.

The term *waiata* refers more to songs with some modulation, some approach to melody, and includes *waiata aroha* (love songs), *waiata tangi* (laments), *waiata wawata* (songs of longing).

The term *tau* in part covers the same ground as *waiata*, but it in part covers the same ground as *karakia* also, since it includes songs with modulation as well as intoned chants; the latter, however, have less to do with ritual. It is noticeable, during the taking of records on the dictaphone, that the singer, if in doubt as to what to call the song about to be sung, very often said "*He tau*" ("a *tau*").

The term *haka* includes songs with action, and these may be either intoned or modulated.

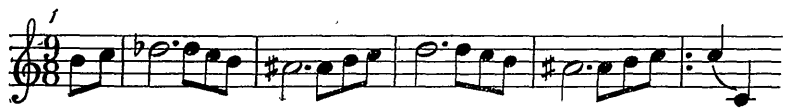
These are a few of the more definite classes, but songs whose subject should apparently include them in one or other of these may have quite another name: thus, *pihe* and *kaha* are both dirges or laments, or *waiata tangi*; *hari* is a song with dance; *peruperu* a war-song accompanied by action and dance.

Whilst as a rule the musical accompaniment to the song was quite subordinate, there was yet a class called *rangi* (*rangi* meaning an air or tune): there were *rangi putorino*, songs sung to the *putorino*; *rangi koauau*, songs sung to the *koauau*; *rangi pakuru*, songs sung whilst the *pakuru*, a slender rod held between the teeth, was struck with a smaller rod; *ngari porotiti*, songs sung while twirling the *porotiti* or *kororohu*, the whizgig; *ngari titi-touretua*, songs sung for time-giving whilst playing the game *titi-touretua*, where sticks are thrown from player to player. In the last two the word *rangi* has been transposed to *ngari*. When sung to an instrument, voice and instrument were always in unison, so that a *rangi koauau* would be a song whose melody would be accompanied by a *koauau*.

At Rotorua, during the time previous to the arrival of His Royal Highness the Prince of Wales, in April, 1920, the songs most commonly heard were *tau*, of the sub-class *tau marae*, or songs sung in the common meeting-ground, the *marae*. These were heard every time a new party of Maori arrived at the encampment, and every party had its own particular *tau*, composed for the occasion.

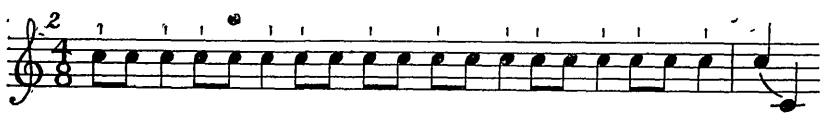
On a party arriving, the procedure was usually the same, though the songs differed. The local people sat on the *marae*, the visitors advancing slowly. From the ranks of the local people an armed man ran out alone towards the visitors, grimacing and brandishing his *taiaha* in challenge. The challenge would be accepted by one of the visitors, who, similarly

armed, would leave the ranks of his party; these two, after a mock encounter, returned to their respective parties, the visitors slowly approaching amid welcoming cries. They paused when a space of about 30 ft. separated the two bodies of people, when the keening took place. Suddenly the keening ceased and the visitors began their chant. In the particular instance noted the Wairoa were the visitors, and their chant was as follows:—



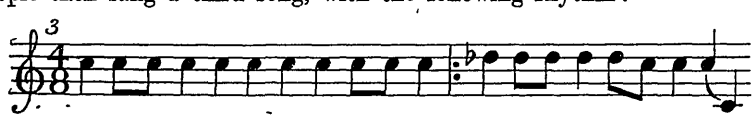
This was a wailing chant, rising and falling, sung very softly, repeated as the varying length of the sentences required, each sentence being closed by the *hiangi*, or slurred drop through an interval of an octave or less. This chant bears some resemblance to the first one recorded by Forster.

The local people immediately followed with a rhythmical monotone:—



This was sung at the rate of four quavers, or slightly over, in a second, the women an octave above the men; but whereas in the first the *hiangi* followed every sentence, in the second the sound was sustained in a continuous stream from start to finish, the *hiangi* coming only once, at the close. One could hear where occasionally a voice ceased for a few seconds, joining the body of sound after the singer had taken breath. A most strange effect is produced on the hearer by this unbroken rhythmical monotone, and the effect of *karakia*, which are intoned in a similar way, can easily be understood. There was a trace of accent on every alternate quaver, or crotchet when this took the place of two quavers, as though the chant were in 2 rather than in 4 time. A chant similar in all respects to this was sung by the Tuhoe people at Gisborne the year before, all standing grouped together in the marquee allotted to them.

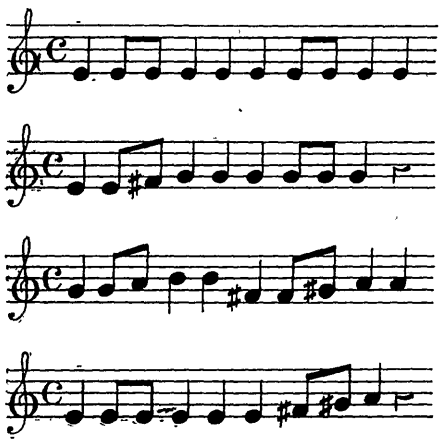
The usual speeches by both parties followed the chant 2, and the local people then sang a third song, with the following rhythm:—



Whilst the rhythm appears the same, the effect is quite different, there being in this no trace of accent. The first part, again, varied in length according to the length of the sentence; towards the close of the sentence the pitch rose a semitone or less, dropping again to the opening pitch immediately before the closing *hiangi*.

It will be noted that the rhythms of 2 and 3 correspond exactly with the theoretical rhythm of the Greek anapest and dactyl respectively, the former consisting of two short syllables followed by a long, the latter of a long followed by two shorts—a long being always, theoretically, twice the length of a short. With very little modification the Maori chant 3 would correspond with the hexameter.

The second movement in Beethoven's Seventh Symphony is based on a rhythm almost identical with the above :—



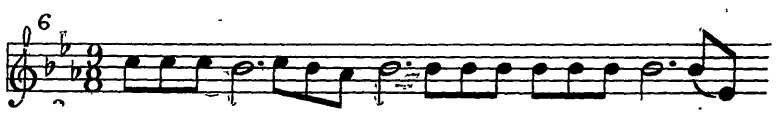
The great formal difference is that the Maori chant is rhythmical, but Beethoven's rhythm is metrical in addition.

In another chant the rhythm of the trochee was noted :—

Here the long-short was often resolved into the equivalent three shorts, the tribrach, and the rhythm of the chant consisted of various combinations of these two, trochee and tribrach.

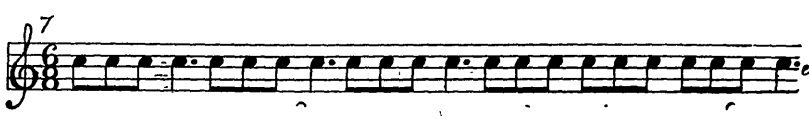
Another chant in dactylic rhythm differed from 3 above in the long-short-short being often resolved into the equivalent four shorts :—

One morning at Rotorua a woman was heard uttering the following :—



It was very early, about 4 o'clock, but this chant rang out apparently without regard to the sleepers round about. It sounded very strange, rising from an otherwise quiet camp. The rhythm is the same as 1, but the wailing quality was absent.

A similar rhythm was heard in one of the songs of welcome :—

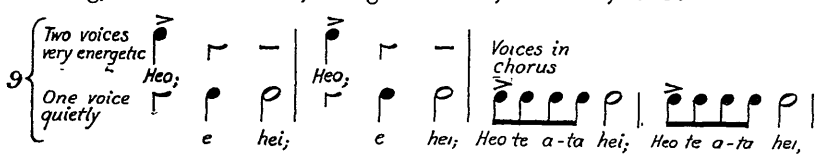


In these *tau* is observed the perfect time kept by the singers, the chant often sounding as though uttered by one composite voice. When action enters the songs the same unanimity is observed. Captain Cook noted the striking of a hundred paddles against the sides of a canoe so as to produce but a single sound; and in the performance of the *haka*, especially when men perform alone or women perform alone, the various sounds, of voice, hands, or feet give the effect of the augmented voice and action of a single person.

The following is the outline of a simple *haka*:—

Though this was opened by the voice, the beat was on the stamp of the foot, when the voice was silent, the cessation of the voice adding emphasis to the stamp. This is the scheme for a *ngeri*, one of the many kinds of war-song.

On a similar scheme, producing an altogether different effect, is the following, heard at Koriniti, Wanganui River, in March, 1921:—



Some young men were practising, two voices singing the *Heo* with very great vigour, one voice following very quietly with *e hei*. This was repeated, and then all three joined, singing the rest together, quickly and vigorously, in the rhythm of the second line.

In many of their songs the time was given by men with *taiaha* or other form of baton in their hand. These men were called *kai tuki*, or *hau tu*. If in a canoe, one or more would stand on the thwarts, giving time with voice and gesture to the paddlers, who might also be singing; they would even run backwards and forwards along the thwarts whilst thus directing the crew.

The familiar *poi* song and dance is one of many posture-dances popular with the Maori; too often, however, a foreign melody takes the place of the old Maori melody or the old monotone. The following is an extremely popular *haka*, based on the shrill summer-singing of the tarakihi (cicada). This is the song that came to the Maori poet, wandering on a summer afternoon in search of inspiration. Approaching a grove of mahoe, in a sequestered, romantic nook, he was suddenly aware of the delirious joy-song of the assembled tarakihi throbbing in the air. At once he composed an introductory stanza followed by a chorus of tarakihi:—

E whakarongo ai au,
Ki te tangi mai,
A te manu nei,
A te tarakihi
I te weheruatanga o te po:

Ta ra ra-ta, ki-ta, ki-ta,
Ta ra ra-ta, ki-ta, ki-ta,
Wiri opapa, toene, toene,
Wiri opapa, toene, toene,
Hope whai a ke
Turi wha tia,
Ei, ei, ha!

Oh, my fancy listening
To the song of songs
Of this singing bird,
Of the tarakihi,
In my dreams in the midst of the night.

Ta ra ra-ta, ki-ta, ki-ta,
Ta ra ra-ta, ki-ta, ki-ta.

O quivering sides, sound the refrain,
O quivering sides, sound the refrain,
And with waist supple,
And bended knees,
Ei, ei, ha!

This song, obtained by the writer through the kindness of Mr. Henry Stowell (Hare Hongi), at once seized the popular imagination, and it was soon converted into a *haka*, or posture-song and dance, with the following introduction :—

E pakia kia rite,
E ko te rite, kia rite,
E takahia kia ngawari,
E torona kei waho hoki mai.

O slap-slap in unison,
O evenly, evenly,
O stamp the feet regularly,
O stretch well forth and draw back again.

On the word *pakia*, the thighs are slapped with the open hands, and again on the word *kia* :—

E *pà*-ki-a *kìa* ri-te,

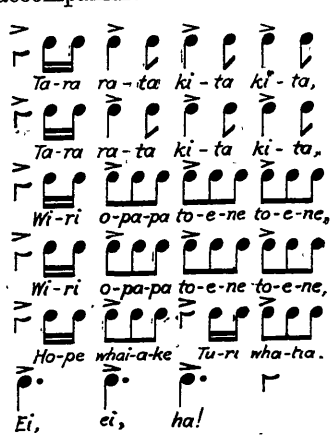
so keeping time whilst the leader gives the next line, where the thigh-slaps are on the words *ko* and *kia* :—

E *kò* te ri-te, *kìa* ri te,

and are continued rhythmically through the next line. Following the thigh-slap, on the word *ngawari*, the right feet are brought down with a stamp in unison with the corresponding thigh-slap. The stamp and slap together then continue through the fourth line. Following the stamp and slap, on the word *hoki*, all arms are stretched well forward, and brought back until the fingers of the inturned hands just tip the shoulders, exactly in time with the foot-beats. These actions are continued through the delivery of the opening stanza :—

E whakarongo ai au.

On the word *Ta*, the first of the chorus of the cicada, the hands are slapped together, probably in imitation of the clicking accompaniment to the insect's chirring song, and so on according to arrangement. The rhythm of the chorus is most distinctive.



The syncopation carried through all but the last line, and doubled in the last but one, is characteristic of the Maori rhythms.

These rhythms are of very great variety, and when a large body of people takes part they are extremely effective, the many strange actions and gestures adding a picturesque wildness. It is noticeable that metre and melody do not go together; the more a song inclines to metrical rhythm, as in the dances, or songs with actions, the more subordinate does the melody become; and those most distinctively melodious are the laments and love-songs, where a certain rhythm may be present, but no metre.

As varied are the songs in which rhythm enters very little, if at all; songs usually sung by one person only, or by one person and a chorus. Watch-songs, love-songs, laments, lullabies, taunting-songs—all have their distinctive character. In listening to one of these, more especially the love-songs or laments, one gathers the impression that the singer dwells chiefly on the best note of his register, his voice rising and falling with his emotion above or below the note, but always returning to it, and on it singing the greater part of the song. The less expert the singer the more he dwells on the one note. The sentences of the songs are of varying length, and each sentence is sung to the same theme, the "wandering" notes, either above or below the chief note, not always agreeing exactly in pitch or combination. Yet there is, apparently, a recognized theme for the phrase, a theme that may be slightly varied but never left altogether. The *hiangi* at the close is not an indication that the breath is exhausted—it is the end of a sentence only; and I have often heard a singer with long breath take the *hiangi* and go on directly without pause to the following sentence. Lullabies are usually on one note, more in the nature of a chant; and here the singer goes on while breath lasts, and the break for taking breath may be in the middle of a word. I have heard the word *aroha* thus broken: breath would be taken after *aro-* had been sung, the new phrase beginning with *ha*, the second part of the word. The Maori does not appear to have a word-sense as we have it; an expression appeals to him more as an expression, not so much as individual words, so that even in dictating the words of a song he will give groups of syllables that may contain several words and part of a word. All syllables end with a vowel, and there appears to be a tendency to make them begin with one also; so that *aua none* and *aua rekareka* were given by one dictator as *au anone* and *au arekareka*. This may be a common natural characteristic, for a similar word-division appears in the odes of Horace, and in the quatrain headings to the cantos of Spenser's "Faerie Queen." Analysis of some of the complicated melodies may be undertaken in a later paper.

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Literature cited.

Colenso, William, Contributions towards a Better Knowledge of the Maori Race, *Trans. N.Z. Inst.*, vol. 13, pp. 57–84, 1881.

Cruise, Richard A., *Journal of a Ten Months' Residence in New Zealand.* London, 1823.

Forster, George, *A Voyage round the World.* 2 v. London, 1777.

Grey, Sir George, *Polynesian Mythology and Maori Legends.* London, 1855; ed. 2, Auckland, 1885.

Hamilton, Augustus, *Maori Art.* Wellington, 1901.

Hawkesworth, John, *An Account of the Voyages by Captain Cook in the "Endeavour."* 3 v. London, 1773.

Polack, J. S., *Manners and Customs of the New-Zealanders.* 2 v. London, 1840. (The earlier edition of 1838 was much revised.)