

the given temperature ; and, if the same vacuum be filled with air, though just the same amount of watery vapour would rise if the temperature is kept the same, yet it would take a considerable time. It follows, therefore, that the diffusibility of watery vapour is rendered much more rapid when the pressure of the air is reduced by its upward oscillations ; it is taken more rapidly into the cold upper regions where it is condensed. It may be interesting to note the experiments of Dulong, which show that "equal volumes of all gaseous fluids, at the same temperature and pressure, on being suddenly compressed or dilated to any equal volumes, disengage or absorb the same amount of heat, and the amount of heat required to raise a gas to a certain temperature increases the more it is allowed to expand. If there be no source of heat from which this additional supply can be obtained, the gas is cooled." And there does not appear to be this source of heat in the highest regions of the atmosphere, where the air is rare, for its diathermancy if dry, as we must suppose it to be in these regions, allows of the transmission of the heat rays of the sun through it, no heat is absorbed by it, therefore none can be radiated, and we have already seen that terrestrial radiation is much diminished by passing upwards through the aqueous vapour near the earth's surface.

Referring once more to the miniature column of the atmosphere contained in the glass tube, if the air be heated it will expand, and if cooled it will contract, and conversely (from what Faraday terms "the Correlation of Physical Forces"); if it be mechanically compressed, its temperature rises, and if rarefied its temperature lowers. With suitable apparatus, the column could be made to show not only a reduction of temperature when mechanically expanded, but also a loss of transparency arising from partial condensation of its watery vapour.

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ART. LVIII.—*Notes on the Chatham Islands and their Inhabitants.*

By GILBERT MAIR.

[*Read before the Wellington Philosophical Society, November 12, 1870.*]

THE Chatham Islanders, or Morioris, or, more correctly, Maiioris, state that they came to the Chathams in five canoes, viz :—*Rangitane, Rangihona, Rangimata, Ruapuke, and Okahu*. They say that they came from the villages of Tahurimanuka and Wharepapa, at Hawaii, whence they were driven by tribal quarrels ; that upon their arrival at the Chathams they found the islands thickly populated by natives, differing very considerably from themselves.

There were two tribes of them,—the Rongomaitere and the Rongomai-whenua. At first, and for some years after, they had numerous fights with these people, but they eventually made peace with each other, and by inter-marriages became as one people.

They had been cannibals up to this time, but upon peace being made they renounced man-eating altogether, and when tribes or individuals had quarrels, they fought with light sticks, and the dispute was decided in favour of the party who drew first blood.

Unlike the New Zealanders, the Maiorioris have neither songs nor chants ; but they have a sort of dance, in performing which they flourished short sticks round their heads.

One of their principal ancestors was named Kahu, the captain of the canoe *Okahu*.

Their modes of disposing of the dead were peculiar. In some instances the corpses were placed upright between young trees, and then firmly bound round with vines, and in course of time they became embedded in the wood itself ; sometimes they were placed in hollow trees. Several skeletons have lately been discovered by Europeans, in trees which they were cutting up for fire-wood, etc. In other cases the corpses were placed on small rafts constructed of the dry flower stems of the flax ; water, food, fishing lines, etc., were then placed by them, and they were set adrift and carried out to sea by the land breeze. Not long ago an American whaler discovered one of these rafts with a corpse seated in the stern, many miles from land. Not knowing that it had been sent adrift purposely, the captain had a rope attached to it, and towed it into Whangaroa Harbour, much to the annoyance of the natives.

An old sealer, Jack Coffee, who has been living at the Chatham Islands since 1832, informed me that he found the Maiorioris very numerous when he first went there, and that on one occasion he counted over a thousand men on the beach going to Waitangi. He was on the Island when the *Ngatiawa* and *Ngatimutunga* went down from New Zealand. He says they treated the inoffensive Maiorioris with great cruelty, but not so barbarously as is generally supposed. They killed and ate great numbers because they would not submit, but fled to the woods, from whence they issued occasionally to steal the crops and to break the canoes of their conquerors. For these petty acts of retaliative aggression, the offenders who happened to be caught were killed and eaten.

When the Maiorioris entirely submitted to the rule of their conquerors, they were treated with much more consideration.

In 1839, an epidemic carried off great numbers of the Maiorioris, sometimes as many as forty dying in a single day.

This epidemic was, no doubt, identical with the great plague of influenza which, in the same year, committed such ravages in New Zealand. Probably one-half of the Maiorioris died from this cause ; a third, perhaps, were slain by the cruel *Ngatiawa* and *Ngatimutunga* ; and thus the rapid diminution of the unfortunate Chatham Islanders may be accounted for.

The foregoing notes may hereafter be found incorrect in some respects as

I only had an opportunity of conversing with two or three old men, who did not seem to know much, and referred me to others who, they said, could give me a great deal of information respecting their early history, and could count back more generations than the New Zealanders.

I think that very much remains to be collected concerning this most interesting race, which is rapidly becoming extinct.

[Mr. W. L. Buller, F.L.S., who visited the Chatham Islands in 1855, informs me that the author has omitted all reference to an important circumstance connected with the conquest of the early Maiorioris, and accounting in some measure for the rapid extinction of the race, the particulars of which will be found recorded in a pamphlet published by Dr. Dieffenbach, which is now very rare.—Ed.]

ART. LIX.—*On the Analogy between the Maori and Indo-European Languages.*

By EDWIN FAIRBURN.

(ABSTRACT.)

[Read before the Auckland Institute, October 10, 1870.]

THE present paper will consist chiefly of a comparison of words. Before proceeding, I would, however, point out certain resemblances of grammatical structure which the Maori bears to the Indo-European languages.

1st. The resemblance of the Maori definite and indefinite articles respectively to the English, as *he* = *a*, *te* = *the*. Also, of particles forming cases, as *o* and *a* = *of*, identical with *o* and *a*, the Old English form of *of*; also, the particle *ko* (interchangeable with *to*) sometimes used in Maori for the dative *to*.

2nd. The formation of substantives from verbs in Maori by the addition of *nga*, *hanga*, *tanga*, *ranga*, etc., resembling the English *ing* and German *ung*, by which the same process is effected in the same manner.

3rd. The formation of the present participle by the addition of *ana* to the verb, resembling the Sanskrit *ana* of the middle voice, the Latin *ans*, and the English *ing*, etc., applied similarly to form the present participle.

4th. The superlative is formed in Maori by prefixing *tino*, "very, exceeding," to the adjective; in Latin by affixing *timu*, in Zend *tema*, and in Sanskrit *tama*.

5th. In most Maori verbs the perfect tense coincides with the imperative and passive, which last two are always identical; but when the perfect does not so coincide, it is formed by a reduplication of the first syllable, as—imperative, *taari-a*, "wait;" perfect, *kua tatari ia*, "he has waited;" resembling a similar reduplication in the Greek and Sanskrit perfects.

In the preceding example, the particle *kua* helps to form the perfect. German has a similar particle, *ge*, prefixed to form the perfect.