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STONE MOUNDS AND RIDGES IN MAORI AGRICULTURE

B. Mitcalfe

The use of stone mounds or ridges as garden divisions was a feature of most Polynesian sites where surface stone would otherwise have made gardening very difficult. The building of stone walls is a fairly general cultural trait among gardeners in stony sites, for obvious reasons, but there are some features of Maori stone ridges and mounds that are not obvious that are, in fact, very puzzling.

Dry stone walls such as those on the scoria-littered slopes of Taiamai (New Zealand) or among the lava-beds of Hawaii or the stony flats of Tahiti need no explanation beyond the descriptions of Best, Handy and Andia. Their function seems obvious:

"In certain volcanic districts where the land was cumbered with blocks of scoria, such debris has been collected by succeeding generations and piled in heaps or in rows that bear the appearance of stone fences. In some situations they were used to construct walls that served to shelter the sweet potato plants from the wind. The Taiamai district, from Pakaraka to Ohaeawai, is such a place. One sees hundreds of heaps of stones piled up by husbandmen of yore. Some seem to have sunk a certain distance into the earth in the course of many generations."

Elsdon Best goes on to describe smaller lines of stones, and says:

"These were the narrow paths that separate the different family plots."

(Best, 1930: 362)

E. S. C. Handy (1928: 147) quotes a Hawaiian who describes garden practice on stony volcanic land: "Rocky lands in the olden days were walled up all around with the big and small stones of the patch until there was a wall about two feet high, and in the enclosure were put weeds of every kind, ama'u tree ferns and so on and then topped wall with soil taken from the patch itself to enrich it or in other words to rot the rubbish and weeds and make soil."

Andia (Corney, 1913: 273) at Tahiti observed in the late 18th century, "The natives find it necessary to pick out the lumps of stone and with these they bank up piles of loose earth on the surface of the ground, two feet or more in height, where they make their nurseries and seed beds. They dig drains along the borders of these which also do duty as boundaries between the holdings of different persons."

There is much here that is self-evident. But when one examines New Zealand stone ridges and mounds certain unusual features emerge which indicate that the provision of shelter and marking of boundaries were not the only function of garden walls. Andia's Tahitian account, which describes how ridges of earth and stone also did duty as seed beds and nurseries, seems appropriate to some New Zealand sites, where stony ridges and mounds contain black, greasy, organically-enriched earth. Most of the stones of this type of ridge have obviously been through fire, and the earth of the ridge generally contains many small fragments of charcoal. Ridges of this type are a feature of the Wairarapa coastline, intermittently from Palliser Bay to Flat Point. Some of the ridges and mounds of the Kaikoura and Kapiti areas are similar. It is not unusual in these areas to find dry stone walls together with earth and stone ridges within the one complex (Mitalfe, 1970).

J. Rutland in 1894 described how the 1855 removal of the forest in the Pelorus Sound district "brought to light traces of human occupation wholly unexpected". He goes on to describe artificial mounds, pits and terraces containing ashes and charcoal "on elevated points of land not chosen for concealment or defence". He mentions mounds of burnt earth and stone in the Pelorus Valley and along the Patoa River and tributary stream: "All the mounds at present discovered are in open fernland". As they contained greasy matter which Rutland supposed to have come from the burning of "porpoise blubber and splinters of bone, supposed to be fishes", he came up with an ingenious theory. They were funeral pyres. Perhaps they were, for certain fishy creatures. But there are ridges and mounds in the Pelorus Valley identical with those of the Wairarapa which, though they have this same association with fire, seem to encompass Maori garden soils. These are friable soils with gravel added and with pronounced darkening from charcoal and other organic substances.

A section cut through ridges, mounds and gardens at Waikakeno showed that the charcoal-darkened soil was much richer, finer and more black and greasy in the ridges and mounds than on the loose disturbed gravelly layers of what were apparently gardens in the spaces enclosed

by the structures of stone and earth. Moreover the ridges and mounds contained the cultural detritus - broken fish-hooks, shell, fish-bone, flakes of obsidian, limestone and flint and adze chips - that one associates with an occupation or cooking site. Do the ridges and mounds represent the clearing of stone from former feasting grounds? If so, how does organic material of a very fine texture, ideally suited to gardening, appear in the walls? It is too fine to be raked or carried in a kit.

If burning on a garden site helps accumulate potash and can release valuable phosphates just before planting (Dundas, 1944: 124) then the Maori had good scientific reasons for bringing manuka and brushwood and getting a conflagration going on his garden sites, but the evidence of firing - charcoal-blackened earth and, perhaps coincidentally, oven-stones - is much more apparent on the stony ridges and mounds than in the garden soils. According to Dr Watters, "Burning produces a marked decrease in potential acidity - also performs a function similar to that of frost .. in preparing a friable surface that is often ideal for the germination of seeds" (Watters, 1960: 81). If this is the case, then one would expect to find evidence of burning on the garden soils themselves. One does find this, but not on anything like the same scale as in the ridges and mounds. One finds also gravelly-textured manufactured Maori soils - like those described by D. Pick (1968, 11: 3) in a very concise survey of gravel pits and kumara soils in the Waikato - but these extend over the gardens and the ridges and mounds.

What garden function, if any, do these ridges and mounds have? They are found in climatically marginal areas for kumara cultivation, from the Wairarapa to the Kaikoura and possibly on Banks Peninsula at Menzies Bay, Long Lookout Point, Stony Bay, Gough's Bay and Duckfoot Bay. There are other sites with stone and earth walls and mounds, like the Banks Peninsula ones, on Pirongia, and in Tamaki (now, unfortunately, almost obliterated by encroaching housing), at Paraparumu, at Bartlett's Flat near Gisborne, on Kapiti Island, on the Hen and Chickens Islands, Poor Knights Islands, Little Barrier Island, Great Barrier Island and at Baring Head (a dubious example, possibly post-European). These are - apart from Tamaki where our evidence comes largely from C. F. Angas's earlier observations\* - in

\* "Clearings in the scoria are also discernible at the foot of the craters where the blocks of lava are piled up in heaps; these were evidently removed by the natives to form gardens for the cultivation of their kumaras and other vegetable productions near their fortification." Savage Life and Scenes in Australia and New Zealand. C. F. Angas, Vol. 1, 1847, pp. 296-7.

areas that are today fairly remote, unlikely to be disturbed by ploughing or obliterated by European settlement. But though some walled areas have been apparently destroyed, those who are alert may still see evidence of stone walls or of mounded and blackened earth, even in areas where considerable European agricultural disturbance has taken place. For instance, Beckett in 1957 described below Mataiuku Hill, near Paraparaumu "two rubble walls .. running parallel to each other from the swamp to the foot of the escarpment." Though the road and railway have almost obliterated these, it is still possible at the higher level to see the obviously artificial agglomeration of stone. Yet Beckett saw the wall being demolished by workmen. It is important that we have a wider appreciation of the distribution of these sites. Were they made also in earth only? Ridges and ditches, possibly pre-European, in Tupou Bay, north of Whangaroa, suggest that they may have been. The stone walls in these localities named may simply be the only signs surviving of what was widespread agricultural practice. I doubt this because Cook, Solander, Banks, Savage, Earle, Colenso and others (Walsh, 1903: 12-24; Best, 1929 and 30) have described brushwood shelters intersecting and surrounding the garden areas, but no walls. Is it possible that the brushwood windbreaks, set in stone and earth ridges on stony ground, were annually burnt? This, together with the use of the ridges as walkways, would account for the abundance of burnt and blackened material and the presence of small artefacts, most of them broken, in the interstices of the rocks.

There are many possibilities which must be put to the test. Otago University's archaeological survey of Palliser Bay is attempting to determine, through excavation and chemical and microscopic analysis, the function of at least one walled complex. But the intensive investigation of sites in the Wairarapa needs to be complemented with the extensive survey and tentative classification of similar walled, ridged or mounded sites throughout New Zealand. So far their distribution suggests an association with kumara agriculture in areas that are either excessively stony (where dry rock walls are a feature in association with the ridges of stone and earth), and in areas that are excessively exposed.

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