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STONE WALLED COMPLEXES OF CENTRAL AUCKLAND

Agnes Sullivan

ABSTRACT

Stone walled complexes which occurred in some number in central Auckland on volcanic soil are now preserved only on the urban fringe. They are broadly similar, despite some internal variations, and strong environmental control is indicated in their location. The probable time range is undefined prehistoric to early historic.

INTRODUCTION

Stone walled complexes can be described as systems of walls, enclosures and structures of various types, with remains consisting largely of stonework, which throw an occupation network over fairly large areas of ground.

These systems have been recognised in Polynesian prehistory for a considerable time, one of the first identifications in New Zealand being made in the Auckland area in the 1840s (Logan Campbell, 1881, 244). The systematic investigation of these features and their place in the prehistoric human ecology of an area is quite recent. Studies were initiated in the Hawaiian Islands in 1968 (Green, 1970, 31), and continue to be actively pursued there. In New Zealand recent work was initiated by H. M. Leach and B. F. Leach, who have directed a series of investigations in the Wairarapa (Leach and Leach, 1971, 199). Dr H. Wellman and V. Neall are investigating stone walled complexes at the mouth of the Clarence River in the South Island (Neall, pers. comm.) and D. K. Byrne and M. Taylor have made a preliminary survey and excavation in an area of stone walled structures at Waipoua, Northland (Byrne, pers. comm.).

Identifications of stone walled complexes can be collated in increasing numbers throughout New Zealand and, though their distribution is not yet fully known, it does not so far fall outside the area of prehistoric sweet potato cultivation. It is postulated here that walled plots in the central Auckland area discussed below were garden enclosures and that their main crop was sweet potato. This hypothesis remains to be formally demonstrated.

The objective here is a preliminary descriptive survey of the extent of stone walled complexes on the Tamaki isthmus, roughly the area of urban Auckland and its outskirts on N.Z.M.S. 1, Sheet N42, between Henderson and Howick, and including the North Shore and the immediate offshore islands. Survey methods consisted of a study of records in the Auckland district file of the New Zealand Archaeological Association's site recording scheme, and a search of aerial photographs and the Historical Photograph Collection of the Auckland Institute and Museum Library. This was followed by walk through field surveys.

ENVIRONMENT

The survey area of roughly 200 square miles (520 sq. km.), is about three-fifths land and two-fifths sea. The land is about half a mile wide at its narrowest point, and ten miles at the widest, with easy access to the sea everywhere because of a long, indented coastline. Geologically, it is a slab of Tertiary mudstones and sandstones, worn down to a mature landscape of rolling slopes and valleys, and partly drowned by the latest Pleistocene sea level fluctuations; the high areas now being an average 100 feet (30 m.) above sea level. These materials form heavy, sticky soils of low to average fertility, which predominate in the north and west. To the south and east, there are Quaternary sediments forming surfaces at lower levels, and carrying rather similar soils. An average annual rainfall of 40 inches (101 cm) is fairly evenly spread, though somewhat heavier in winter (June-August). Frosts occur but are relatively infrequent and fairly light, seldom being more than 1-2 degrees C.

Over the last 60,000 years or so a series of volcanic eruptions has poured volcanic deposits over the Tertiary and Quaternary land-forms, raising the land height by 500 feet (150 m.) in places. The eruptions form a restricted volcanic belt, extending from north to south across the centre of the region. This belt possesses features which are small-scale, and it is multi-centred, and entirely basaltic in character. Volcanic activity has been classified by Searle (1964, 41) as varying from dominantly explosive to dominantly effusive; the range of surface expressions includes low explosion craters, tuff rings and small tuff cones, scoria cones, and major and minor lava flows. These types of activity produced varying quantities of loose surface debris, in most cases in considerable amounts. These loose basaltic fragments range in type from occasional lumps of massive lava, to ropy pieces of pahoehoe, lumps and cobbles of varying degrees of vesiculation, large amounts of scoria, and pieces of volcanic bombs. In a few areas where larger loose material was minimal, deposits were mainly fine ashy particles. The volcanic areas cover about one-third of the central

isthmus, and carry friable red brown loam soils except for the most recent eruptive centre, Rangitoto Island, which has an inverted soil profile. Red brown loams are the preferred sites of present-day market gardens, which in itself is some indication of fertility and ease of working.

DISTRIBUTION

Study of the distribution of stone walled complexes on the isthmus has indicated a strong environmental control. The structures occurring in them are made from fragments of basaltic volcanic rock with semi-rounded surfaces. For brevity, these rock fragments will be referred to in the rest of this paper as "stones".

Complexes are found only on volcanic soils, in areas where the ground, before initial clearing, would have had a stone-strewn surface and upper soil zone. No stone wall systems have been seen on soils derived from the rather soft sedimentary rocks. On the isthmus, these soils are generally free from stony debris of any kind. Nor has the practice of carrying debris from volcanic localities on to sedimentary soils in order to form a continuation of a stone walled complex been observed. However, there is evidence for horticultural activity, not involving stone wall systems, on the sedimentary soils (Davidson, 1970, 105; Law, 1970, 93).

It appears that in the past reasons for making use of the stone strewn volcanic soils of the isthmus for gardening were strong enough to discount the preliminary effort needed to clear the surface and topsoil of stones and pile them up into structures, in addition to clearing the natural vegetation cover. It is also clear that stones were shifted no further than was necessary. The requirements, then, for the occurrence of a stone wall system on the isthmus seem to have been a combination of enough loose volcanic stones to make systematic relocation of them a necessity for gardening, together with sufficient volcanic soil to make clearing worth while. These conditions would have been met over a large part of the volcanic belt. In some localities where volcanic soils were developed on tuffs and ashfalls there would have been little loose surface debris, and here the intensity of observed surface remains decreases. In a few places, quantities of rough blocky lava produced rockfields where horticultural activities were probably minimal or unrewarding. Unfortunately, none of these areas is now in an unmodified condition, and the amount of prehistoric activity appears unascertainable.

Because the survey region is now largely covered by an urban agglomeration, stone wall systems and part systems survive mainly on the

fringes. Surviving complexes and part complexes include the following (Numbers refer to localities on Fig. 1; where compound names are given for complexes there are multiple volcanic centres, usually isolated cones, within the complex):

1. Wiri-McLaughlins, south of Mangere airport. About 700 acres (280 hectares) with the greater part reasonably intact.

2. Styaks-Greenmount-Otara, east of the Tamaki inlet. Originally of similar size to the Wiri-McLaughlins system, it is now fragmented by industrial and urban development, with remaining patches totalling less than 50 acres (20 hect.).

3. Puketutu Island, off the west coast of Mangere. Now joined to the coast by oxidation ponds of the metropolitan sewerage system, it previously covered the whole island of about 200 acres (80 hect.) but has recently been much reduced by forestry, quarrying and land clearance.

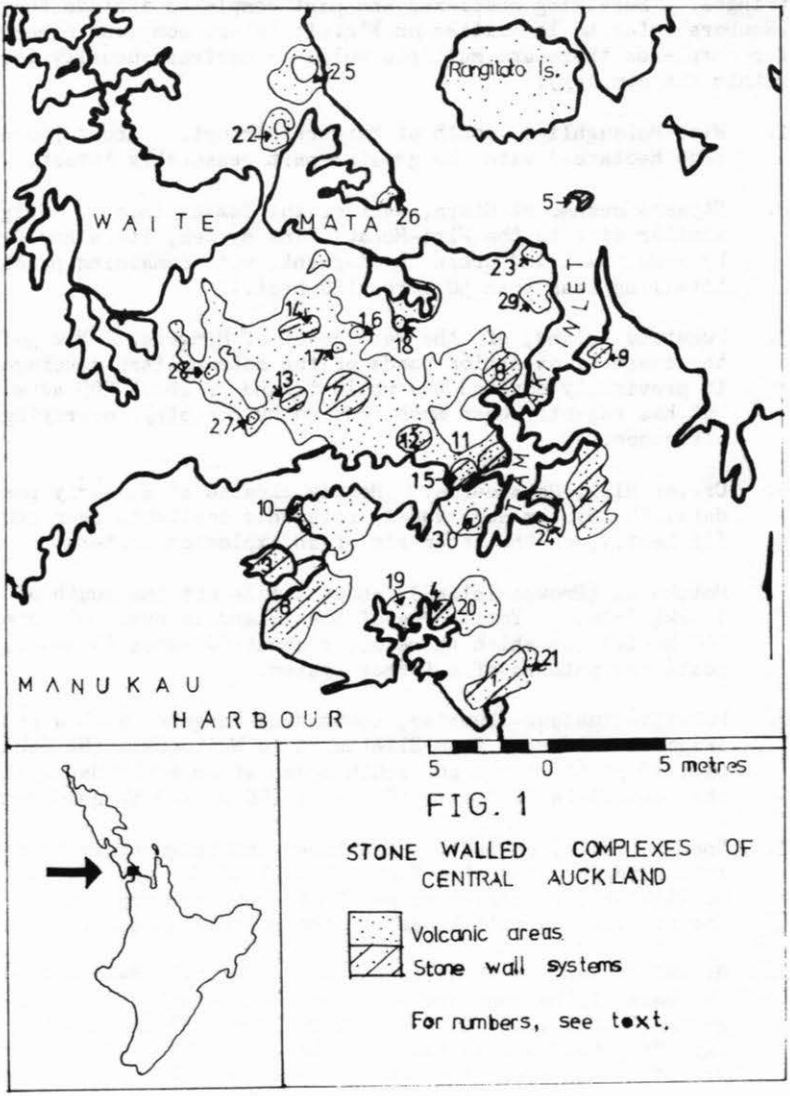
4. Crater Hill, Papatoetoe. Mostly cleared at an early post-European date, the system survives in fragments scattered over about 30 acres (12 hect.), on the inner rim of an explosion crater.

5. Motukorea (Browns Island), about a mile off the mouth of the Tamaki Inlet. Total area of the island is over 100 acres (40 hect.), on which there occur about 10 acres (4 hect.) of scattered patches of a former system.

6. Pukeiti-Otuataua-Ihumatao, south-west Mangere, with a probable original extension from Elletts Mt to Waitomokia (Mt Gabriel). Cleared on the north and south edges at an early date, it has only the central part of over 100 acres (40 hect.) in good condition.

7. One Tree Hill, central. Scattered and fragmentary traces of an extensive former system found throughout Cornwall Park, in particular a grassed-over patch of about one acre (0.4 hect.) at the foot of the main height on the south-east side.

8. Mt Wellington, south-east central. Several small patches around the base of the cone are still extant, though of less than five acres (2 hect.) in all. A report from 1847 (Mundy, 1852, II, 101) says "for half a mile round the base .... hundreds of scoria walls", suggesting an extensive system which is partly recorded in the Auckland Institute and Museum Library Photographic Collection.


Rangitoto Is.
WAITEMATA
INLET
MANUKAU
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5
0
5 metres
FIG. 1
STONE WALLED COMPLEXES OF CENTRAL AUCKLAND
Volcanic areas
Stone wall systems
For numbers, see text.

FIGURE 1

9. Pigeon (Pidgeon) Mt, Pakuranga. Scattered fragmentary grassed-over walls of less than one acre (0.4 hect.) found on the remains of a small volcanic patch.

10. Mangere, the area west of Mangere Mt. Scattered indications only of the probable earlier existence of a stone walled complex on cleared land in the Ambury Road area on the seaward fringes of a basalt flow from Mangere Mt.

11. Flatrock, Auckland City abbatoir holding paddocks in Fisher Road, Mt Wellington. Isolated indications only now of a stone walled complex formerly extending out from the McLennan Hills volcanic centre.

In addition there is evidence of various kinds, particularly in the Photographic Collection of the Auckland Institute and Museum Library, in early aerial photographs and in literary sources, of the total destruction of the following systems since European occupation of the isthmus.

12. Mt Smart (Rarotonga), south-east isthmus. Probably at least 100 acres (40 hect.) in extent, of which about 30 acres (12 hect.) of walls and other structures were still surviving 20 years ago. It is now a heavy industrial area around the site of the demolished volcanic cone.

13. Three Kings (Te Tatua), central isthmus. Probably rather larger originally than the system at Mt Smart, there were 40 acres (16 hect.) of walls belonging to it still existing in 1940 around the central group of cones. It is now covered by residential housing.

14. Mt Eden (Maungawhau). The 19th Century photographic evidence indicates the survival of several acres of a system in one locality adjoining the cone. As well, other photographs record isolated traces of probably prehistoric stone structures of what was once possibly an extensive system.

15. Mt Richmond (Otahuhu; earlier European name, Mt Halswell). Now a built-up area, it was mentioned by Mundy (1852, II, 101) as having, like Mt Wellington, a half-mile of stone walls around the base.

There is also the probability, based on photographic evidence, that there were stone wall systems reduced to isolated traces by

the mid-19th Century, around the bases of Mt Hobson (16), Mt St John (17), and perhaps the now demolished cone of Little Rangitoto in Remuera (18). These identifications are not strong enough to be relied on without additional evidence.

The above list of stone wall systems does not exhaust the total area of volcanic land within the survey area suitable for cultivation. It is a possibility for future inquiry that all volcanic soil on the isthmus was, at one time or another, used for prehistoric gardening. Under this hypothesis, a cultivation system should have extended over all suitable volcanic soils, even isolated volcanic patches such as Pigeon Mt or Browns Island. The intensity of stone structures in a locality is seen as dependent on initial concentrations of uncleared surface debris, and not primarily as a function of agricultural intensity under this hypothesis. Cultivations probably linked to those in the stone-walled complexes would have existed in areas such as the rim of the explosion crater, Pukaki Lagoon (19), the Papatoetoe Craters (20), adjacent to but distinct from Crater Hill, Papatoetoe, and Ash Hill, Wiri (21). They may also have been found at Tank Farm - Onepoto (22), St Heliers (23) and Pukewairiki (24). In all of these places there were areas of deep volcanic soil. These last, based on ash and tuff, possessing little solid surface debris, therefore exhibit little or no development of stone-walled complexes, although their use is predictable within the framework employed in analysis.

In addition, there remain for consideration quite extensive areas of volcanic soil which are identical in nature to the areas on which systems survive or are known to have survived till recently. It is therefore possible, though there is no direct evidence at present, that stone-walled complexes may have at one time been constructed in the vicinity of Lake Pupuke (25), Mt Victoria - North Head (26), Mt Roskill (27), Mt Albert (28), Taylors Hill (29) and Sturges Park (Mt Robertson) (30). Information from Mr J. T. Diamond (pers. comm.) suggests that part of the Mt Roskill-Mt Albert area in the 1930s looked very similar to the Wiri-McLaughlins complex at the present day.

The central isthmus and North Shore were regions of both extensive and intensive activity soon after European settlement, and large areas appear to have been ploughed as early as the 1840s and 1850s. Clearing for ploughing would involve the removal of all surface collections of volcanic stones over blocks of tens of acres, thereby effectively removing all traces of stone-walled complexes from the surface of land whose topsoil had probably already been cleared by prehistoric effort.

In this period, the cleared stone was commonly used to build boundary walls around European-type enclosures, employing a dry stone

walling technique. The resulting walls ran for several miles on the large holdings. Massive early European unmortared stone walls are found on all areas with existing stone walled complexes, as most of these areas were not cleared for ploughing but used to run stock. Such walls are also photographically recorded on all areas of destroyed complexes, and still survive here and there around vacant factory lots and old houses. In addition, they are found as 19th Century house and field boundaries, on areas which could have supported stone wall systems. Thus they tend to provide supporting indications of the probable earlier existence of prehistoric stone wall systems in these areas.

STRUCTURES

In existing complexes, wall structure has been extensively modified by the activity of European introduced hoofed animals, and by deliberate removal. Walls are intact only in a few places, and then only in part. The construction technique in most cases was basically dry stone walling. Walls forming part of surviving complexes appear to enclose plots of largely stone free soil in the larger enclosures. Shapes and directions of walls and sizes of plots are partly controlled by the topography. Where topography is not a factor, a rectangular plot, roughly twice as long as it is broad, is often found as a unit of land division. Small enclosures tend to be concentrated into multi-unit structures, and these, with a variety of other structures, tend to form interstices between larger walled plots. They usually occur on ground which would have been unsuitable for gardening either because of gradient or because of the existence of bare rock outcrops.

Wall sub-types based on construction include double faced and single faced walls and lines of single stones. There are also marked topographic or locational wall types including flat ground walls, scarp edge and scarp top walls, slope base walls and ridge top walls. Other formal types in addition to walled enclosures and multi-units are rough stone piles, semi-platforms, terraces and a few L-shaped and C-shaped piles. They may also include possible filler walls in mouths of caves, pool and stream side kerbs, and semi-isolated "markers" consisting of prominently placed blocks of moderately large size. Structural groups are usually the site of shell middens.

In every locality examined most structures utilise stone. Structural forms which do not use stone consist of pits dug into the subsoil, earth terraces or levelled areas, and a few possibly prehistoric low earth scarps.

RELATIONSHIP TO HILL TOP SITES

The relationship of prehistoric occupation on the volcanic cones of the isthmus (which forms the subject of a body of Maori traditional history) to the stone wall systems seems to be complex, but a few preliminary remarks can be made. All volcanic cones subtended some ground which could have been used for stone walled garden plots. This was often, in fact usually, an extensive area. A regrettable number of the cones are now damaged or destroyed, but all are recorded to have carried remains of prehistoric occupation on their summits and slopes in a variety of forms, including artificial terraces, pits and sometimes overtly defensive structures. In many cases these remains include structural stonework very similar to that found in the associated stone walled complexes below. Within the area of any one stone wall system there may be several separate volcanic cones with occupation remains, each surrounded by structures forming part of the system. In cases where it has been possible to trace the wall system to the base of a cone and up its lower slopes, stone walls radiate out initially from the cone, and then form a more irregular network, suggesting that in these instances the original grid may have been laid down and the initial clearance made by working outwards from the base of the cone. Whatever the details and duration of the various relationships may be, spatial association between hilltop sites on cones and stone wall cultivation systems is unmistakeable. This is a further, if indirect argument for the probable existence of stone wall systems round those few cones (Mt Victoria, Mt Roskill, etc.) where they are not now evidenced.

DATING

There are indications that the use of stone walled complexes, though not necessarily any one particular complex, extended over some length of time. A firm upper limit to the utilisation of complexes is set by the 19th Century drystone walls built across them.

It cannot be stated at this stage whether any stone wall systems were constructed in the early historic period though this is perhaps unlikely. In addition to the European stone walls, a few other post-European structures are scattered through most of the systems. These reflect the post-European practices of keeping animals, and consist mainly of protective stone fences for planted trees. Most structures, on the field evidence, are readily assessable as either pre- or post-effective European cultural penetration of the isthmus and the vast majority are apparently pre-contact. The only structural category which can be chronologically ambiguous, as far as present information goes, is the roughly conical stone pile, which may be either prehistoric or in some cases a result of quite recent activity.

Some complexes may have been in use in the earlier part of the 19th Century. Logan Campbell, who with his partner Brown bought Browns Island from its Maori owners who resided in another district, states from his first visit in 1842 (Logan Campbell, 1881, 244):

> "There were long lines of stone walls here and there, and the usual six-foot high fern was replaced by a short dry-looking grass - a sure sign that the land had been cropped for many and many a year, so as to have completely eradicated the fern."

This passage, while not entirely unambiguous, strongly suggests a recent disuse of at least part of this stone wall system. At any rate discontinuation of cultivation would appear to date within the 19th Century, and perhaps not more than a few years before.

In the absence of radiocarbon determinations, present control over the lower end of the time span for both construction and utilisation is poor. Excavation of structural elements at one end of a wall in the southern part of the Wiri-McLaughlins complex showed no European material of any description except on the present day ground surface. A total occupation depth of 60 cm. was exposed in a context which indicated a number of distinct episodes of utilisation. This cannot yet be taken as proof of a prehistoric nature of the occupation here, but it seems at present a reasonable hypothesis from which to work.

If one accepts as functional the strongly suggested association between occupation on volcanic cones and use of these field systems, this too supports their prehistoric age, and indicates a possible time depth of up to 400 or 500 years.

Thus by extrapolation it is possible to set up a presumptive and tentative time range for the stone wall systems of the isthmus for testing, ranging from a vaguely defined prehistoric to an early historic. The lowest point and actual distribution of remains on the time scale remain a matter for investigation.

APPENDIX: N.Z.A.A. SITE RECORD NUMBERS

While fully subscribing to the general policy that new sites in New Zealand should not be initially published unless identified by N.Z.A.A. site record numbers, I feel there are several practical points to consider in attempting to follow this policy for the central Auckland stone walled complexes. Firstly, a "site" in New Zealand

field surveys is characterised by a degree of discreteness, and by sufficient spacing from neighbouring sites to make it possible to regard it at least technically as an entity. In a single stone wall system in the Auckland area one may be faced with several hundred groups of features. Each group, if it occurred in isolation, would rank as a site. An aim in future surveys on the isthmus must be to assign distinguishing codes under the N.Z.A.A. system to all features of all complexes. However, these groups of features do not share the degree of apparent isolation which characterises other recorded sites. They are set in close proximity to each other, and are for the most part physically interconnected by walls and other structures, and in total they comprise an integrated structural network occupying a considerable acreage. A good case can be made for regarding a single stone wall system, at least prima facie, as a single unit or site, and for following a policy of subenumeration of each of its components. Work is proceeding in the inventory of features of only one complex (Wiri-McLaughlins) at present. However, there is a definite need to catalogue the stone walled complexes of the entire isthmus, for in the process of investigating their extent and significance for the prehistory of the region, one becomes aware that all the major remaining complexes are under threat from several directions.

Mention was made earlier in this paper of the association of stone wall systems and terraced cones. The latter in fact could in one view be ranked as large features embedded in particular systems; and initially and tentatively, most stone wall systems could be identified under already existing site numbers as extensions of either terraced cone sites or in a few cases, other sites which fall within their bounds. This would provide the following Auckland district site numbers in association with the known stone wall systems:

1. Wiri-McLaughlins. NZN42/24 - N42/17.
2. Styaks - Greenmount - Otara. N42/16 - N42/28.
3. Puketutu Island. N42/19.
4. Crater Hill, Papatoetoe. N42/136.
5. Motukorea (Browns Island). N42/31.
6. Pukeiti - Otuataua - Ihumatao. N42/21 - N42/22 - N42/23.
7. One Tree Hill. N42/6.
8. Mt Wellington. N42/4.
9. Pigeon Mt. N42/30.
10. Mangere, regarded as fringe of westward extension from Mangere Mt. N42/18.
11. Flatrock, regarded as extension of McLennan Hills. N42/2.
12. Mt Smart. N42/3.

13. Three Kings. N42/10.
14. Mt Eden. N42/9.
15. Mt Richmond. N42/5.

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I would like to thank Roger Green for reading a draft of this paper, for helpful stylistic emendations, and for the suggestion that known dates derived from excavations on occupation sites on volcanic cones might provide a possible outline time span of 400 to 500 years for stone wall systems of the isthmus. Janet Davidson, as district filekeeper for the New Zealand Archaeological Association's site recording scheme, kindly provided access to the Auckland district file. Nola Arthur of the Auckland Institute and Museum Library gave help in a search of the Library's Photographic Collection. Mention should be made of assistance derived from the work of H. J. R. Brown and Alan Taylor who made initial recordings of locations and references for a good number of the Auckland stone wall systems for the Auckland district file of the N.Z.A.A. site record scheme. Peter Bellwood made an initial plane table survey and excavation in the eastern part of the Wiri-McLaughlins stone wall system and has been most instrumental in advocating and encouraging this research.

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