The archaeology of Rapan fortifications

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Introduction
Fortifications were common features in the East and South Polynesian sociopolitical landscape. The initial appearance of defensive features coincides with the first evidence for political hierarchy in West Polynesia (Fiji, Tonga and Samoa, Clark and Martinsson-Wallin 2007; Kennett and Winterhalder 2008) and the competing political systems that they represent. This is roughly coincident with the East Polynesian expansion, and competition for land in West Polynesia may have been one contributing factor stimulating exploration and eventual settlement on increasingly remote islands between AD 800 and 1200. This pulse of migration and settlement to increasingly remote islands was an extension of the Austronesian expansion and provided the agroeconomic context that promoted rapid increases in population, territoriality and competition for limited lands and the periodic use of force to take land and surplus food. It is within this context in Polynesia (and elsewhere) that people focus greater effort on constructing defensive features. Cool and dry conditions in the equatorial Pacific during the Little Ice Age between AD 1450 and 1850 also correlate with a proliferation of fortifications in several parts of the Pacific (Field and Lape 2010).

Rapan fortifications have been used to exemplify defensive sites in Polynesia and have served as an end-member of hyper-fortification and intergroup conflict (Kirch 1984). However, the presence and function of hilltop fortifications on Rapa has been debated since Vancouver (Lamb 1984) reported people living in fortifications on the island in AD 1791. Ellis (1838) questioned the mere existence of these fortifications and argued that the sculpted hilltops and terraces were natural geological features. Stokes (n.d.) dispelled this idea with early ethnoarchaeological work on the island that involved visiting these locations and talking to the Rapan people about their history on the island and how the fortifications functioned. The Norwegian expedition provided the first modern archaeological basis for work on these fortifications and the best descriptions of
these sites in existence. They clearly demonstrated that the largest hilltop sites were settlements as Vancouver described and that a range of defensive features (ditches, etc.) was consistent with the idea that they served a defensive purpose. Walczak (2001) has questioned this idea and suggested that these sites were more ceremonial in nature. Our aim in this chapter is to pull together the various strands of archaeological data available from previous studies and add our own observations.

Archaeological observations

We conducted archaeological survey and small-scale excavation at 10 large and four small fortifications on the island (Figure 12.1). All of the larger fortifications are strategically positioned on the highest points along the main ridge surrounding Ha’urei Bay. The sites range in size between 3040 m$^2$ and 25,237 m$^2$ and all of them have a central tower carved from the soft basalt ridgelines. The smaller fortifications are often found in close proximity to the larger fortifications and they are considered to be satellite communities or temporary refugia. Two of the four smaller fortifications have central towers. We divided Rapa into southern, western and northern sectors to facilitate our descriptions of the available archaeological data and our own observations. We start with the southern sector because we used the Norwegian expedition’s excavations at Morongo Uta to index other observations made on the island during the past century.

Southern sector

Three hilltop fortifications are spaced equidistantly along the primary ridge in the island’s southern sector (Figure 12.2). Morongo Uta (R-1, 258 m) overlooks the western side of Ha’urei Bay to the east and west across the rich agricultural lands in the drainage associated with Iri Bay. Tevaitau (R-18, 262 m) is located at a lower elevation along the same ridge. Today it overlooks the modern community of Ha’urei positioned on what would have been highly productive agricultural lowlands. Tevaitau is separated from Ororangi (R-20, 282 m) by a large drainage and a series of high peaks along the main ridge system.

Morongo Uta is one of the largest and most architecturally complex fortifications on the island (10,148 m$^2$). It is also the best studied. Stokes (n.d.) worked at the site for three weeks in 1921, clearing and recording terraces. Based on interviews with local people, he suggested that the village was originally named Teruta and was occupied by a subdivision of a clan named Kopogoiki that controlled territory between Tekoki and Pukumanga.

Work at Morongo Uta was a focal part of the 1956 Norwegian expedition (Mulloy 1965). Using a large crew of local labour (between 12 and 53 people, see Heyerdahl 1958), the site was cleared of vegetation and excavated between May 21 and June 18, 1956. Controlled excavations were minimal, but the entire site was cleared to expose terrace floors, and formal artefacts (e.g. adzes) were collected as the architecture was examined and mapped. Clearing of the site involved the removal of talus slopes and overburden down to approximately 5–10 cm above terrace surfaces. More careful excavation of terrace deposits was then carried out with smaller hand tools. Excavated sediments were not screened for faunal materials or smaller artefacts and persistent rain during this 28-day period limited identification of subtle features (e.g. post moulds) and stratigraphic control.

Much of Morongo Uta was covered with vegetation during our visit, but all of the terrace units mapped by the Norwegian expedition were visible (Figure 12.3). The site core consists of a tall triangular tower and a surrounding triangular cluster of rectilinear terraces that also points to the south. The tower was carved from the highest peak on the ridgeline and covered with a
Figure 12.1. Map of Rapa showing the locations of primary and secondary fortifications. The island is divided into southern, western and northern sectors for data presentation purposes and discussion. Drafted R. Van Rossman. 1 = Ororangi (R-20); 2 = Ngapiri (R2002-50); 3 = Tevaitau (R-18); 4 = Morongo Uta (R-1); 5 = Pukutaketake (R2002-42); 6 = Noogurope (R2002-43); 7 = Kapitanga (R-5); 8 = Ruatara (R-17); 9 = Vairu (R-3); 10 = Potaketake (R-2); 11 = Tapitanga (R-4); 12 = Pukutai (R-19); 13 = Pukumia (R2002-39); 14 = Taua (R2002-40).
Figure 12.2. IKONOS satellite images of Morongo Uta (R-1), Tevaitau (R-18) and Ororangi (R-20) fortifications. Size estimates, site boundaries and tower orientation are based on field observations and features (e.g. terraces) visible in IKONOS imagery. UTM coordinates are from the centres of each tower. The small numbered triangles on the Ororangi image are the locations of auger tests and the larger rectangle is a 1 m x 1 m test excavation. The locations of test excavations at Morongo Uta and Tevaitau are shown in figures 12.3 and 12.7. Drafted J. Bartruff and D.J. Kennett.
The archaeology of Rapan fortifications

Dyke-stone masonry facade. It has a flattened upper surface measuring 10 m x 5.4 m. Stokes excavated the upper flattened surface of the tower and documented a stone-lined oven or hearth in its centre (n.d.:385). At the time, local informants told him that this was the chief’s residence and that his closest kin lived in houses positioned on the surrounding upper terrace units. Mulloy (1965) found this implausible, but the upper surface is quite large (34 m²) and dark midden soil containing charcoal and adze flakes is exposed on its northeastern edge (Exposure 2). A charcoal sample from this cleaned exposure was AMS radiocarbon dated to between AD 1500 and 1600 (UCIAMS-2178).

Mulloy (1965:61) mapped 89 terraces at the site, including the enclosure at the top of the tower. The total surface area of these terraces was estimated to be 5406 m². Large numbers of terraces radiate out from the site core along the main ridge and down into the Iri Bay drainage. Dyke-stone walls surround several of the ridgetop terraces and similar walls parallel the ridge were used as outer retaining walls which were backfilled to create flat surfaces. Many of these walls were reinforced with double interlocking masonry walls filled with a rubble core. Some of the longer terraces were divided into smaller units with walls. The organisation of terraces becomes less formalised with distance from the site core and Mulloy (1965:23) suggested that these were added as populations expanded and clans split into subclans. Stokes (n.d.) also identified additional domestic terraces 300 m to the north of the site core on the same ridgeline and argued that these satellite houses (or auga) were also part of the same community. Multiple deep fosses and associated walls cut through the ridgeline at strategic locations point to a large

Figure 12.3. Map of Morongo Uta based on the Norwegian expedition’s original map, field observations and IKONOS satellite imagery. Exposures were cleaned to examine stratigraphy and collect radiocarbon samples. Drafted R. Van Rossman.
labour investment in defence that is consistent with Vancouver’s observations of multiple wooden palisades surrounding these communities (Lamb 1984). Mulloy (1965) suggested that some of these features were excavated after terrace units were in place and indicated heightened aggression later in time.

The Norwegian expedition also documented a number of features and artefacts that provide insight into the types of activities that took place in these communities. Most floors were identified as concentrations of charcoal that were discontinuous across the terrace floor. Terrace walls did not extend above the floor surface and were not designed to support a superstructure. Rectilinear terraces provided platforms for perishable structures made from wood, grass or fronds. Postmoulds were identified, but wet conditions prohibited clear delineation of these structures. Stone-lined cooking pits (ovens) and more formal hearths consisting of three or four tabular stones were identified on many of the terraces (e.g. enclosures 2, 3, 8, 10, 12, 19, 24, 35, 45, 53, 55, 80, 82, Mulloy 1965, figures 7–11). Several smaller d-shaped terraces were interpreted as possible storage features (p. 32) and cylindrical pits of different sizes may have served to store water or taro (see discussion). A group of three prismatic stones driven upright in Enclosure 18 were interpreted by Mulloy (p. 34) as a possible household shrine. Although the Norwegian expedition did not screen and collect faunal and floral remains, Mulloy noted that ‘the evidence of daily debris was plentiful’, and our observations confirm that dark midden deposits containing charcoal, shell and bone are present at the site. They also collected artefacts indicating a range of daily activities, including 60 whole or fragmented basalt adzes of different types and 60 whole or fragmentary poi pounders (Figure 12.4). Poi anvils were identified and left in place and other types of artefacts were also found in small numbers (circular disk, polishing stones and other groundstone artefacts). This does not include the full range of perishable artefacts that must have been used. Mulloy (1965:53) reports charred fragments of a fish net or netted bag that were identified within a midden in Enclosure 6, but these remains were not recovered intact. We pulled radiocarbon samples from four different midden exposures and these dates suggest persistent use of this site between AD 1600 and 1830 (Figure 12.5).

Our work at Tevaitau was more extensive. The Norwegian expedition recorded this site (R-18), but it does not feature prominently in its 1965 report. It is smaller than Morongo Uta (3666 m²) and, given its overlapping age (AD 1700–1830) and close proximity, it may have developed as a politically connected satellite community (Figure 12.6). Tevaitau has only a distant view of Iri Bay and appears to be more connected visually with the southern part of Ha’urei Bay and the agricultural lands that are now covered with the modern community of Ha’urei. Use of the agricultural lands and access to marine resources via Iri Bay would only have been possible in close consultation with Morongo Uta’s chiefly lineage.

Tevaitau is oriented north–south along the main ridge system and consists of a central tower and 14 small surrounding domestic terraces. Most of the terraces were constructed along the ridgeline, but terraces also drop down into the adjacent drainages to the west and east. There is a steep drop into the Iri Bay drainage to the west and only one significant terrace below the core group was identified. Several terraces extend down a steep ridge into the drainage to the east. Morongo Uta is visible to the west and Ororangi is visible to the east. A nice example of dyke-stone masonry covers the tower and several masonry walls are evident within the core. Several foss-like cuts occur between terraces to the north and south of the tower, and steep terrain to the west and east makes the location highly defensible. A free-standing wall divides a long terrace south of the tower. The site was relatively clear of vegetation and we took the opportunity to map it carefully with a laser transit (figures 12.6 and 12.7).
Figure 12.4. Representative selection of adzes and poi pounders collected at Morongo Uta by the Norwegian expedition. Redrawn R. Van Rossman.

Figure 12.5. Calibrated radiocarbon dates for fortifications in the southern sector based on phase modelling presented in Chapter 11. Prior distributions (routine calibration) are shown in outline, and posterior distributions (modelled within a phase) are solid.
Figure 12.6. Tevaitau (R-18) fortification taken from the south looking north. Photograph D.J. Kennett.

Figure 12.7. Map of the Tevaitau (R-18) showing the locations of excavation units and auger samples.
The site is disturbed by wind and water erosion and there are several looter's pits present in different terraces, the largest just to the south of the central tower. We also learned on the island that Jerome Walczak (2001) had excavated several fortifications in the late 1990s and that he had spent several days at Tevaitau. Documentation of all these excavations is limited (Endnote 1), but he reports excavating a large portion of the upper tower surface of Tevaitau (10 m²) and this large open pit is visible today. He reports finding 922 basalt flakes during this excavation, mostly blanks and adze flakes. These flakes were found in association with wood charcoal, shells and bone, including a goat bone in the surficial deposits that is clearly intrusive given the late introduction of this species. We augered (9 cm diameter) the remaining deposits around this test excavation and identified dark midden deposits that extended from ca. 10 cm to 30 cm below the surface.

Similar midden deposits containing basalt flakes, shell, bone and charcoal were evident in two natural exposures and in other auger tests across the site. These deposits range from 30 cm to 80 cm in maximum depth. Based on the density of materials evident in natural exposures and auger tests, we placed three 1 m x 1 m excavation units into undisturbed deposits on a large terrace to the east of the central tower. The deposits are shallow in this location (10–25 cm) and the units bottomed out on the artificially flattened terrace below. Dark midden soils containing charcoal and faunal materials occurred in all these units and there were several small pits that were excavated into the flattened bedrock terrace below. Feature 1 in Unit 2 consisted of two upright tabular stones arranged in a similar fashion to the hearths identified by the Norwegian expedition at Morongo Uta (Figure 12.8). Dark midden soil containing charcoal and faunal materials surrounded Feature 1 and one large concentration (ca. 20 cmbs) was AMS

*Figure 12.8. Planview map of Unit 1 (20 cmbs) at Tevaitau (R-18). Drafted R. Van Rossman.*
radiocarbon dated (UCIAMS-2186) to between AD 1650 and 1750 (see Figure 12.5). A total of 12 basalt adze flakes were recovered in these shallow excavations.

The sediments excavated in units 1–3 were screened in the field with 1/8th inch mesh. Once we determined that sediments contained preserved faunal materials, we also took large bulk samples (six litres in total) for flotation and complete recovery of all faunal and potential floral material. In this way, we recovered the richest faunal assemblage recovered from an island fortification, and associated candelent fragments that were directly AMS dated (UCIAMS-80840) to between AD 1700 and 1800. The faunal assemblage is composed of nearshore reef fishes that include parrotfishes (Scaridae), damselfishes (Pomacentridae), wrasse (Labridae), pufferfish (Tetraodontidae) and moray eel (Muraenidae). The parrotfishes are the best represented and this may be due to their distinctive character and resistance to decomposition. Rat bones (*Rattus* sp.) were also recovered and are consistent with the observations made by the Norwegian expedition that these hilltop fortifications were also the primary nodes of residence (see Butler, Appendix C). Three AMS radiocarbon dates from these units and one from Exposure 2 on the south end of the site point to occupation between AD 1700 and 1830. Given the substantial overlap in age with the later deposits at Morongo Uta, along with its close and unobstructed proximity, it may have developed as a satellite community of this larger polity.

To the east of Tevaitau at about the same elevation (282 m) is the Ororangi fortification (R-20; see Figure 12.1). It is geographically isolated from Morongo Uta and Tevaitau by a valley that has a steep and impassible ridgeline in its headwaters. The fortification overlooks the modern community of Ha’urei to the west and it is well connected to the exterior of the island via Angatakuri Bay to the east. Tapitanga is visible across Ha’urei Bay and Stokes noted two smaller fortifications in the vicinity (Mititipeiru and Karagarua) and one of these is visible from Ororangi to the southwest.

Ororangi (5157 m$^2$) is slightly larger than Tevaitau, but substantially smaller than Morongo Uta. The architects at this site took advantage of a high point in the southwest-to-northwest oriented ridge to construct an elongated tower. Two impressive upper terraces surround this elongated tower and together they form the site’s core. A total of 43 terraces were documented at the site, but vegetation covers large sections of it to the north and west. The largest number of terraces occurs along the main ridge to the southwest and northeast of the site core. These terraces are rectilinear along the flat portions of the southwestern terrace and more d-shaped down a steeper section of the ridge to the northeast. A cluster of six small terraces (each 5 m x 5 m) occurs on the southwestern flank of the site core and small d-shaped terraces drop down the steep ridges towards Ha’urei Bay. The largest domestic terraces drop down the more gradual slopes towards Angatakuri Bay.

Ororangi does not have the same types of dyke-stone masonry architecture as Morongo Uta and Tevaitau. Terraces were cut directly into the ridgelines and cutting and moving the soft basalt bedrock created flattened surfaces. A sketch map of these terraces was produced and 11 auger samples were taken from across the site (see Figure 12.2). The upper ca. 10 cm of these auger tests consisted of culturally sterile orange sediment that sometimes contained sparse amounts of modern material. Below these upper deposits were prehistoric sediments between 10 cm and 40 cm thick. These sediments were darker and contained charcoal and the occasional adze flake. At the base of these sections, the darker midden transitioned to the underlying soft basalt bedrock that had been flattened to create the terrace. Midden deposits appear to be best developed on the second and third terraces to the north of the tower (augers 5 and 6). Work on the southwestern arm of Ororangi was limited by dense vegetation.

The tower at Ororangi is well preserved and the entire upper surface appears to be intact.
Sediments on top of the tower are dark brown and covered with a thick layer of grass. An auger test near the centre of the tower suggested intact deposits containing charcoal were between 20 cm and 30 cm deep. A small test unit (Unit 1, 1 m x 1 m) was placed near the northwestern side of the tower. Some modern debris was found in the upper 5 cm within sediments that were otherwise culturally sterile. Dark midden soil containing charcoal, fire-cracked rock, adze flakes and faunal material was encountered at ca. 10 cm below the surface. A small cluster of fire-cracked rock was encountered in the eastern part of the unit at ca. 10 cm below the surface (Feature 2) and may be the remnants of an oven. This feature occurred just above the basalt surface of the terrace that had been flattened prehistorically. A much larger fire feature became visible at ca. 10 cm in the northern and western portion of Unit 1 (Feature 1, Figure 12.9). This feature was excavated into the underlying basalt to a maximum depth of ca. 50 cm. The pit contained dark silty sediment with large quantities of charcoal and fire-cracked rock. This is similar in character to the fire feature described by Stokes on top of the tower at Morongo Uta.

Most of these sediments were screened in the field (1/8th inch mesh), but a two-litre flotation sample was taken and examined for floral and faunal remains. Six basalt adze flakes were recovered, along with a small amount of faunal material, including 21 parrotfish (Scaridae) bones and one Elasmobranch (shark or ray) bone (see Butler, Appendix C). A radiocarbon sample taken at the top (UCIAMS-2190) and bottom (UCIAMS-2182) were nearly identical and put Ororangi contemporary with Tevaitau and the later stages of occupation at Morongo Uta (AD 1700 to 1830).

Western sector

The western sector of Rapa is rugged and contains the highest mountain peaks on the island (Perau, 650 m). A ridge running to the south of Anarua Bay and its associated drainage forms the southern boundary of this sector. Tupuai Bay and its associated drainage roughly delineate its eastern boundary. Pukutaketake (R2002-42), Noogurope (R2002-43), Kapitanga (R-5) and Ruatara (R-17) are the four primary fortifications in this area and they are all positioned on

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Figure 12.9. Stratigraphy in Unit 1 at Ororangi. Drafted R. Van Rossman.
the main ridge system overlooking the prime agricultural lands at the head of Ha’urei Bay. The Norwegian expedition mapped Kapitanga and visited Ruatara, but it is unclear from its reports whether it examined or visited Pukutaketake and Noogurope. All of these fortifications are clearly identified on Stokes’ map from the 1930s. Pukutaketake and Noogurope overlook Anarua Bay to the west. Kapitanga and Ruatara overlook Pariati, Akatamiro and Tupuaki bays along the northern shore. These sites range in size between 3000 m$^2$ and 7000 m$^2$. This was the least studied part of the island, by us, but our preliminary work suggests that two of the fortifications, Noogurope and Ruatara, were among the first to be constructed on Rapa. Future work at Noogorupe and Ruatara should be a high priority.

Noogurope is the highest elevation fortification on the island (608 m), and Perau (650 m), the tallest peak along the primary ridge system, provides a strong protective barrier blocking easy passage to and from fortifications to the north and west (e.g. Kapitanga and Ruatara). All of the other fortifications on the island are visible from this vantage point. Access from Ha’urei Bay is also limited by a series of rock escarpments and cliffs blocking easy passage. The fortification is small (3040 m$^2$) and consists of 12 terraces surrounding a small circular tower. Nicely formed dyke-stone walls were evident along the eastern and western sides of the upper terrace and a fragmentary segment also occurs along its southern periphery. Unlike Kapitanga to the northwest, the circular tower at Noogurope is not faced with dyke-stone. The longest series of terraces extends to the northwest along the ridge leading towards Perau. Terraces also extend down the subsidiary ridge system to the west towards Anarua Bay and there appear to be several terraces to the east on the ridge dropping down to Ha’urei Bay. Farther down the ridge to Ha’urei were several domestic terraces built with dyke-stone walls. These are associated with a dyke-stone outcrop. A large talus slope is present on the northern side of the outcrop and the large amounts of debris scattered across the surface are suggestive of quarrying activity, but more work is needed to establish the extent and character of this site.

At Noogurope we excavated four STPs (test pits) on the uppermost terrace (Figure 12.10). Charcoal-rich midden soils were encountered in all of these sample test pits and extended down to between 10 cmbs and 25 cmbs. A charcoal sample collected at 25 cmbs in STP #2 returned a date of 650 ± 15 bp (UCIAMS-47241). This is the earliest date at Noogurope and the earliest date associated with a fortification on Rapa. Another date from STP #3 from the basal deposits (15–25 cmbs) returned an age of 230 ± 25 bp (UCIAMS-60739). We also cleared off a natural exposure (Exp #1) on the northeastern side of the second northern terrace. A charcoal-rich midden deposit was defined between 10 cmbs and 37 cmbs, and a charcoal sample recovered from 20 cmbs returned an age of 120 ± 15 bp (UCIAMS-14756). This is comparable in age to STP #1 (10–19 cmbs, UCIAMS-60740) and suggests occupation until approximately AD 1830. Overall, the calibrated dates at this site range between AD 1300 and 1830 (Figure 12.11). Preservation of faunal material was poor in these deposits and only a few adze flakes were recovered during our small-scale excavations.

The imposing site of Ruatara sits on the tallest mountain peak (304 m elevation) on the main ridge system between Vairu and Kapitanga. It is the largest (6940 m$^2$) fortification in the north-central sector and among the largest fortifications on the island. Due to its central position, it has a commanding view of the prime agricultural lands at the head of Ha’urei Bay and of three external drainages and associated bays to the north (Akatamiro, Tupuai and Akanamu). The tower is one of the tallest on the island (5 m) and a step series of four narrow terraces down its western flank adds to the prominence of the tower (Figure 12.12). Sixteen terraces in total radiate from the tower along the primary ridge system and down subsidiary
Figure 12.10. IKONOS satellite images of Pukutaketake (R2002-42), Kapitanga (R-5), Ruatara (R-17) and Noogurope (R2002-43) fortifications. Size estimates, site boundaries and tower orientation are based on field observations and features (e.g. terraces) visible in IKONOS imagery. UTM coordinates are from the centres of each tower. The small numbered triangles are the locations of auger tests and sample test pits. A small 0.5 m x 0.5 m test unit was excavated on top of the tower at Ruatara. Drafted by J. Bartruff and D.J. Kennett.
ridges to the north and south. Compared with other sites on the island, the use of dyke-stone construction was fairly limited.

One of the unique features of Ruatara is a series of wall-like linear earthen mounds that separate the lower terraces at the site. A series of six well-defined terrace units, often divided by these high earthen mounds, extends from the site core along the primary ridge to the west. These terraces were heavily vegetated during our visit, but a cow trail cuts through and has exposed midden deposits at several locations. Midden soils were shallow, but well developed in both exposures 2 and 3. Exposure 3 occurs along the northwestern terrace wall (8 cmbs) and contained charcoal that dates to 630 ± 15 bp (UCIAMS-47243), comparable in age to the earliest deposits at Noogurope. A similar exposure on the western side of the next terrace to the east produced a much more recent age (11 cmbs, 170 ± 15 bp, UCIAMS-47244). One of the best examples of an earthen wall occurs between two of the most prominent terraces on the southwestern arm of the site. Midden-like deposits were evident in a natural exposure on the eastern side of this earthen mound and this was most likely recycled as construction fill from a previous occupation. A charcoal sample collected from this exposure (14 cmbs) returned an age of 345 ± 15 bp. Calibrated age ranges for the site are AD 1300 to 1830 (see Figure 12.11). Two large pits similar to those found at other fortifications occur in the middle of the terrace just to the west of this earthen mound feature. Future excavations should be undertaken to determine the function of these pits, but they were probably used for the storage of taro, as proposed by Stokes (n.d.).

The tower at Ruatara is impressive and it is unclear whether the thin terraces on its western flank were defensive or domestic features. STP #1 was placed in the middle of the second terrace west of the tower and excavated down to 40 cmbs without encountering midden soils. A second test unit (STP #2) was excavated down to 35 cm and a thin midden soil containing charcoal

Figure 12.11. Calibrated radiocarbon dates for fortifications in the western sector based on phase modelling presented in Chapter 11. Prior distributions (routine calibration) are shown in outline, and posterior distributions (modelled within a phase) are solid.
occurred at about 15 cm and was radiocarbon dated to 210 ± 15 bp (UCIAMS-14774). The tower itself is tall (an estimated 5 m) and is squared off on its northern and western side. Remnants of dyke-stone masonry are evident, but these stones were either recycled elsewhere or the masonry was never as well developed as in other nearby locations (e.g. Kapitanga). The planar upper surface of the tower is 8 m x 3 m in size and is oriented east–west. It was certainly large enough to serve as a residence. Dark midden soil containing charcoal, shell, bone and adze flakes was evident across the surface of the tower. A circular test pit (STP #3, 20 cm diameter) was excavated in the centre of the tower and dark midden soil containing charcoal and adze flakes extended down to 35 cm. Unit 1 (25 cm x 50 cm) was excavated 2 m from the tower’s western edge and 50 cm from its southern edge. These deposits were excavated in 10 cm levels down to 35 cm. Faunal materials were reasonably well preserved in these deposits and were dominated by parrotfish (Scaridae, see Butler, Appendix C). Other fish (Serranidae, Labridae) and rat (Rattus sp) bones were also identified in these deposits.

Kapitanga (288 m elevation, 3674 m$^2$) is located between Noogurope and Ruatara in the northern section of the island. Compared with the earlier fortifications in this sector, it is highly consolidated with dyke stone-lined domestic terraces similar to Potaketake (R-2). The Norwegian expedition was drawn to this location because of its hyper-fortified position and its well-formed oval tower covered with a beautiful dyke-stone masonry facade. They considered it the best example on the island. Defensively, this fort was enhanced relative to other locations because of a steep rock precipice 100 m tall on the east side of the fortification. The western
side of the fortification is also well protected by a series of steep ridges. Eleven domestic terraces occur in three compact tiers. Rubble-filled double retaining walls bound the upper terrace. Multiple pit features similar to those at Potaketake were also identified and two fosses were strategically placed on the western and southern flanks to cut off the only two viable entry points into the fortification. Large basalt adze flakes were evident on the surface of the northern exposure at the site.

Pukutaketake is positioned on a high point (381 m) overlooking the mountain pass between Anarua and Ha’urei Bay. Noogurope is visible across the pass to the north and Morongo Uta occurs on the same ridge system just to the southeast. Stokes referred to this site as west Potaketake and people living on the island in the 1920s considered this to be one of the oldest sites on the island. The site was heavily vegetated during our visit, but 23 terraces were identified running along the main and subsidiary ridges. The overall size of the site is small (3975 m²) compared with Ruatara. The site has a well-formed tower, but lacks the dyke-stone masonry evident at other sites. Dyke-stone masonry is rare except for a few remnant sections along the southern and east edge of the upper terrace.

We excavated seven exploratory STPs (each 20 cm in diameter) at the site, and most of these (STPs 1–5) were in the terrace surrounding the central tower (see Figure 12.10). One of these was excavated into the northeastern edge of the tower itself. Dark middens containing high concentrations of charcoal was encountered in all of these units at approximately 10 cmbs. Adze flakes were more commonly encountered in these deposits than in other locations on the island. These midden deposits were between 20 cm and 30 cm thick, and charcoal appeared to be more commonly concentrated on the outer edges of these terraces. Midden deposits containing charcoal also occurred on the top of the tower, along with several fire-cracked rock fragments, suggesting that a hearth or oven was located near the excavation unit. Two STPs were also excavated at the end of a long terrace that extends east from the central tower. The deposits were more ephemeral and probably severely wind deflated. The radiocarbon date from one test pit (STP #2, UCIAMS-14760, -14759) places it in the final fortification phase between AD 1700 and 1830.

Northern sector

The northeastern sector of the island consists of land roughly delineated by the ridgeline separating Tupuaki and Akananue bays (and associated drainages) and all of the land on the eastern shore of Ha’urei Bay. Three of these drainages flow outwards to Akananue, Agairoa and Akatanui Bays and one flows inwards to Ha’urei Bay. Sharp ridgelines delineate these drainages and provide the easiest overland paths between fortifications and other upland sites. In certain instances, ridges were flattened or modified (e.g. staircases) to promote movement between locations, but ditches and fosses were also placed in strategic locations to inhibit travel. The remains of three large fortifications occur along the ridge separating the inner and outer parts of the island. Each fortification was strategically placed at the juncture between the main ridge and one or two secondary ridges extending out to the coastline. Vairu (R-3) is positioned at the top of the ridge (369 m) that separates Akananue and Angairao. Potaketake (R-2) overlooks Agairoa and Akatanui Bay at the ridge separating these two drainages, and Tapitanga (R-4, 268 m) overlooks Akatanui and Ha’urei bays and sits directly above the modern town of Area. The available radiocarbon dates indicate that they were all established and occupied during the final phase of fortification between AD 1700 and 1830 (Figure 12.13).

All the large fortifications were visited in this sector and limited excavations were carried out at Tapitanga and Potaketake to build on previous work by the Norwegian expedition. Vairu
was visited briefly and is estimated to be 4213 m$^2$ in size (Figure 12.14). As with the other large fortifications, it has a well-formed central tower, and at least 11 domestic terraces extend outwards from the central tower along the main ridge and down the secondary ridge separating Akananue and Angairao. Auger tests on multiple terraces and on top of the flattened tower exposed midden soils containing charcoal and the occasional basalt adze flake. Midden soils were also exposed at the edge of the uppermost terrace on the western side of the site. None of these midden soils were deeper than 30 cm and most were 10–20 cm thick. Two radiocarbon dates, one from Auger #7 (tower) and the other from Exposure #1, suggest occupation between AD 1700 and 1830.

Both Tapitanga and Potaketake sit above the headwaters of Akatanui Bay. AMS radiocarbon work places both fortifications just prior to European contact, with Tapitanga dating earlier, between 1700 and 1750, and Potaketake dating to between AD 1750 and 1830. The Norwegian expedition mapped these two sites in the 1950s and we use its observations as a starting point for describing our work at these sites. Tapitanga is the largest fortification on the island (25,237 m$^2$), but the site is dispersed and clear evidence of terracing and use is isolated to a much smaller portion of the entire area (Figure 12.15). A poorly developed tower carved from the highest point of the ridge marks the centre of the fortification, and it is surrounded by a consolidated cluster of smaller domestic terraces. Five more distant terrace groups, positioned away from the central group, radiate out along the ridge systems surrounding Akatanui Bay and down the slope towards Ha‘ürei Bay. Several pit features were visible on the surface of the site, as described by Ferdon (1965), with the best examples in the central and eastern parts of the site.

Free-standing walls and stone-lined terraces are rare at this location and many of the
Figure 12.14. IKONOS satellite images of Potaketake (R-2), Vairu (R-3) and Tapitanga (R-4) fortifications. Size estimates, site boundaries and tower orientation are based on field observations and features (e.g. terraces) visible in IKONOS imagery. UTM coordinates are from the centers of each tower. The small numbered triangles are the locations of auger tests and sample test pits. Drafted J. Bartruff and D.J. Kennett.
structures are heavily eroded. Ferdon (1965) noted more formal architecture, with a few exposed masonry walls exposed in the central precinct and some of the southwestern terrace groups. Terraces were cut directly into the ridge and the distribution of these terraces is skewed towards the Ha’urei Bay side of the ridge, but the upper terrace and tower were clearly positioned to overlook Akatanui Bay. Ferdon (1965) argued for an early occupation of this fortification compared with other forts in the area, based on its dispersed form, its lack of formal walls and defensive features (e.g. fosses), and the heavy erosion it has suffered. It does appear to have been constructed earlier than the other fortifications in the northeastern sector.

Seven augers and one sample test unit (STP) were excavated in terraces on the western side of the fortification and we also examined an exposed oven on the eastern end of the fortification down the ridge towards Akatanui Bay. Dark midden soils containing charcoal and the occasional adze flake were encountered at each location between 5 cm and 10 cm below the modern ground surface. These midden soils were generally between 20 cm and 30 cm deep, but midden soils extended to 60 cm below the surface in the centre of one well-formed rectilinear domestic terrace.

We also excavated two units at this site. Unit 1 (1 m x 1 m) was established on the west side of the tower along the northern wall of a domestic terrace. The unit was placed close to a large basalt boulder that had been heavily battered at some point in the past. Surface collection in the vicinity of the boulder and Unit 1 revealed a large number of primary basalt flakes (N=75). Unit 1 was excavated in naturally occurring levels and all material was screened (1/4” mesh).
for maximum recovery. Stratum 1 varied in depth between 5 cm and 10 cm and was a well-developed dark-brown midden soil containing flecks of charcoal and basalt flakes. Removal of this level exposed a stone terrace wall on the north side of the unit and several concentrations of fragmented basalt in the east side of the unit. Stratum II comprised orange-brown soil that contained flecks of charcoal. The cluster of broken basalt visible at the base of Stratum I was revealed to be an oven containing high concentrations of fire-cracked rock, dark brown soil and charcoal (Figure 12.16). An alignment of rocks occurs in the southern side of the unit and was possibly the foundation of an interior wall. A hearth or oven originally excavated into Stratum III was also identified at the base of Stratum II (30 cm) in the eastern side of the unit. It contained large concentrations of charcoal and fire-cracked rock. Charcoal and basalt flakes were recovered while screening (2 mm, 15 litres). Preservation was limited and no faunal remains were recovered, but several burned candlenut (*Aleurites moluccana*) fragments were also recovered from this stratum. Stratum III was an orange-brown soil with a high clay content and contained no charcoal or cultural material. An auger probe in the northern side of the unit indicated that this soil extended down 60 cm to bedrock. The only radiocarbon dates from this site come from the interface between Stratum I and Stratum II (S1, UCIAMS-2180, 145 ± 25 bp) and from the hearth feature (UCIAMS-2179, 140 ± 20 bp).

Unit 2 (50 cm x 50 cm) was excavated on the southern side of the tower near a natural exposure of midden soil containing bone. Midden soil extended to approximately 30 cm below the surface and was excavated in 10 cm intervals. Faunal materials were recovered from all three levels (2 mm mesh) and are dominated by parrotfish (*Scaridae*, NISP of 30, of which 15 are teeth). Larger bones in the sequence are sea turtle, but the bone was poorly preserved and the exact species could not be identified. A large number of unidentifiable vertebrate bones was also recovered (Butler, Appendix C).

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**Figure 12.16.** Stratigraphy in Unit 1 at Tapitanga. Drafted R. Van Rossman.
Potaketake (R-2) is located at the junction between the ridge lines that form the Akatanui, Angairao and Ha‘urei watersheds, at 217 m elevation. From this vantage point there is a commanding view of agricultural lands in two external drainages, Akatanui and Angairao, and the upper portions of the Ha‘urei watershed. The hilltop village of Tapitanga (R-4) is located only 0.5 km to the south across a saddle in the ridge at the head of Akatanui Bay. A series of rockshelters with occupation ages between AD 1300 and 1500 are present along the northern shore of the bay, along with several stone fish traps that occur along the edge of the bay.

The heavily wind-blown and eroded remnants of a tower form the centre of Potaketake (Figure 12.17). Well-formed domestic terraces surround this tower in two distinct tiers along the north–south axis of the site. Defensive ditches were cut into three ridges surrounding the residential core. Two of these occur within the residential compound interpreted either as an expansion of the core settlement or a two-part defensive system. Potaketake was surveyed and mapped by the Norwegian expedition in 1956 (Ferdon 1965:13). At that time the tower was intact and composed of a conical bedrock and earthen fill spire reinforced by a masonry wall. Free-standing masonry walls lined the edges of the primary domestic terraces surrounding the central tower. Ferdon noted several large pits within the confines of the site that he interpreted as defensive features. However, local people referred to these as taro pits and the position of some of these features suggests that they were water cisterns or storage pits. Stone slab hearths, most likely for heating room blocks, were also identified on the surface of the northern sector of

Figure 12.17. Map of Potaketake showing locations of auger tests and excavation units. The map is based on the Norwegian expedition’s original map, field observations and IKONOS satellite imagery. Drafted R. Van Rossman.
the site. An eroded face on the northern sector of the site revealed a dark midden soil and bell-shaped poi pounders similar to those found during the excavations at Morongo Uta.

Potaketake (217 m) was covered with low grass during our visit and most of the architecture was visible on the surface (Figure 12.18). The terrace walls and stone-lined hearths described by Ferdon (1965) were clearly visible, along with the dark midden soil eroding from the edges of the stone-lined rectilinear terraces. Double stone walls filled with soil surround most of the terraces in the central precinct. Much of the tower is now destroyed and only a short dyke-stone wall remains surrounding the eroded basalt core. The largest eroded exposure at the site occurs on the northern edge of the central group of domestic terraces. Large flecks of charcoal and fragments of shell were visible in the exposure, including the inner whorl of a large gastropod. The remnants of an oven are also visible in this exposure (fire-cracked rock, burned soil and high concentrations of charcoal). One of our workmen showed us an adze that he had collected from the site (Figure 12.19). Unit 1 (1 m x 1 m) was placed near this erosional face and excavated in naturally occurring levels (Figure 12.20). The uppermost stratum (10–15 cm) consisted of very dark greyish brown (10 YR 3/2) silty soil with sparse amounts of charcoal. The sediment in this stratum is well sorted and contains very few pebbles or small rock inclusions. Soil from this level was screened through a 2 mm sieve and larger chunks of charcoal and eight basalt flakes were recovered. Underlying this stratum is a very dark brown (10 YR 2/2) silty clay containing higher concentrations of cultural material. Charcoal concentrations remain high in this stratum, mixed with sub-angular pebbles and stones.

A series of superimposed oven features (features 2–4) was encountered during the excavation of this stratum and it is visible in the southern and eastern walls of the excavation unit (Figure 12.20). One of these ovens (Feature 4) was excavated into the underlying dark, yellow-brown,
Figure 12.18. Photographs of Potaketake: a) fortification from the south looking north; b) looking north from tower over domestic terraces; c) remnant of dyke-stone facade on tower. Photographs D.J. Kennett.
Figure 12.19. Adze fragment found on the surface of Potaketake. Illustration R. Van Rossman.

Figure 12.20. Stratigraphy in Unit 1 at Potaketake. Drafted R. Van Rossman.

Legend

I Very dark grayish-brown (10YR 3/2) silty soil with sparse charcoal flecks. The stratum is well sorted and has very few pebbles or small rock inclusion.

II Very dark brown (10YR 2/2) cultural stratum with high concentration of charcoal and rounded to subangular pebbles and stones included in the sediment. Features 2, 3 and 4 (all ovens) occur within this stratum (silty with some clay).

sterile, parent soil/rock and it contained eroding basalt. A bifacially flaked basalt tool was found during the excavation of Feature 4, along with four basalt flakes recovered in the 2 mm screens. The three oven features were radiocarbon dated, with the two deepest features (3 and 4 respectively) dating to 240 ± 25 bp (UCIAMS-2188) and 240 ± 20 bp (UCIAMS-2184) respectively, and the uppermost feature dating to 210 ± 25 bp. The calibrated ranges for these dates all fall between AD 1700 and 1800 (see Figure 12.13). Unit 2 (1 m x 1 m) was placed on top of a hearth previously identified by Ferdon (1965) in the northwestern corner of the terrace just north of the tower (Terrace 8, Figure 12.21). Dark yellowish-brown soil and charcoal was found in its centre at 16 cm, but as yet no radiocarbon dates are available for this feature.

Secondary fortifications and refugia

Most of our work focused on the larger fortifications on the main ridge surrounding Ha’uarei Bay, but we also visited and sampled several smaller hilltop sites. Additional fortified locations were also observed from a distance, but were not visited. Those at the highest elevation are consistent with what Stokes (n.d.) described as refuges. Others positioned at lower elevations on secondary ridgelines are usually near larger fortified settlements and they were probably the sites of satellite communities that were linked to the larger sociopolitical systems.

Four smaller hilltop sites were investigated on the island during the 2002 field season (Figure 12.22). One of these smaller fortifications, Ngapiri (R2002-50), is located in the southern sector of the island near Tevaitau and Morongo Uta. The other three smaller upland sites are located in the northern sector of the island near Tapitanga and Potaketake. As discussed previously, Tevaitau may have served as a large satellite community of Morongo Uta, given its close proximity and
temporal overlap, between AD 1700 and 1830. The site of Ngapiri is smaller than Tevaitau and located higher (320 m) on the same ridge in a more defensible location surrounded by steep-faced boulders. The site consists of eight terraces and some of these occur on a razor-thin ridgeline. Dyke-stone walls are apparent along the edges of two terraces and one of these is close to 1 m high. We excavated three sample test pits and dark midden soil containing charcoal and adze flakes were identified in each. The maximum depth of these midden deposits was 25 cm, but most were about 10 cm thick. One charcoal sample from the uppermost terrace produced a calibrated radiocarbon age similar to those found at Tevaitau and the later dates at Morongo Uta (see Figure 12.5). The site does not have a central tower and, with its elevated position, it was probably a refugium as described by Stokes. Given its age and close proximity to Tevaitau, it was either a satellite community or it may have served periodically as a fortified highland refuge for people living at Tevaitau or Morongo Uta.

The other three small hilltop sites investigated occur in the north sector of the island near Akatanui and Angairao Bay. Two of these overlook Akatanui Bay and are linked by ridgelines to the larger fortifications of Tapitanga and Potaketake. Both of these fortifications were constructed during the final fortification phase between AD 1700 and 1825 (see Figure 12.13), but they were probably not occupied simultaneously given their close proximity, their architectural differences, and the available radiocarbon dates. Tapitanga was more likely occupied in the earlier stages of the final fortification phase, whereas Potaketake was probably occupied after

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**Figure 12.22.** IKONOS satellite images of secondary fortifications Ngapiri (R2002-50), Taua (R2002-40), Pukumia (R2002-39) and Pukutai (R2002-19). Size estimates, site boundaries and tower orientation are based on field observations and features visible in IKONOS imagery. UTM coordinates are from the centres of each site. The small numbered triangles are the locations of auger tests, sample test pits or exposures sampled. Drafted J. Bartruff and D.J. Kennett.
this time and into the mission period. The two smaller fortifications date to the latter part of the final fortification phase and therefore appear to be more contemporary with Potaketake.

One of these smaller sites (R-19) was visited and recorded by the Norwegian expedition, but the expedition appears not at have worked at the site. It sits at an intermediate elevation (143 m) equidistant between Point Tekogoteemo and Tapitanga. Today people refer to this location at Pukutai. It overlooks the northern shore of Ha’urei Bay and the flat agricultural lands where the modern town of Area is now located. Compared with Tapitanga and Potaketake, this site is small. Only a few terraces are now visible on its surface, but a tower was purposely carved from the hilltop and remnants of dyke-stone facing are still evident. Three augers were placed on the uppermost terrace surrounding the tower. Organically rich midden soils containing charcoal began at ca. 10 cm and extended down to ca. 20 cm. One radiocarbon sample from Auger 3 (18 cmbs) produced a calibrated radiocarbon age in the later stages of the fortification process between AD 1750 and 1830 (UCIAMS-36952). Pukutai may have served as a moderately fortified satellite community of Potaketake. Access to freshwater, agricultural lands and coastal resources was greater from this location than from the larger fortresses.

The upland site of Pukumia (R2002-39) is quite different from Pukutai. It is located 1 km to the northeast of Pukutai across the drainage associated with Akatanui Bay. Pukumia sits at an elevation of 417 m and has a commanding view of the entire northern part of the island. It is surrounded by steep terrain and several sheer cliffs block access to the site from the south and east. Nine terraces were identified at this upland location. It does not have a central tower and dyke-stone masonry is rare. Stokes appears to have visited this site and classified it as a highland refuge. The small terraces were cut expeditiously from the ridgeline and were not reinforced with rubble-filled masonry walls. Vegetation was sparse across this site and many of the terraces were exposed and wind deflated. Three test pits were excavated, one on each arm of the refuge. Thin midden soils occurred at all three locations, but were best developed on the northern arm of the refuge. These terraces are larger in this area and there are three extending out towards Point Teruapake to the north. A central hearth-like feature was excavated in the first of these. Large quantities of charcoal were evident at the base of this feature and they produced a date in the later stages of fortification expansion between AD 1750 and 1830 (UCIAMS-36951, STP #3, 11 cmbs).

Taua (R2002-40, 280 m) was the last small fortification site that we examined in the northern sector. It is positioned near Point Teruapake on the ridge extending north from Pukumia. Agairao Bay is visible to the west and the site overlooks Piritua to the east. It is reminiscent of R-19 in that it has a miniature central tower and a series of rectilinear terraces, four to the south and one to the north of the tower. The tower was cut from a natural hillock. Remnant dyke-stone walls line some of these small terraces, but not extensively. A deep fosse was cut into the ridge on the southern end of the site. The location is well protected on the east and north by steep sea cliffs. The terraces are separated by slight differences in elevation and midden deposits were exposed between the two southernmost terraces. Dark midden containing charcoal and adze flakes is best developed between 20 cmbs and 30 cmbs. A radiocarbon age indicates occupation in the beginning of the final fortification phase (AD 1700–1750), suggesting that Taua is more contemporary with Tapitanga than Potaketake.

**Discussion and conclusions**

Our work at hilltop fortifications builds on previous work by Stokes (n.d.), Ferdon (1965), Mulloy (1965) and Walczak (2001). We examined 10 previously identified large fortifications on the main ridge surrounding Ha’urei Bay. At the core of each fortification is a central tower,
carved from a high point in the ridge, which is surrounded by one to two large terraces. Terraces extend out from the site cores along ridges or down into surrounding drainages. The sites range in size from 3040 m$^2$ (Noogorup) to 25,237 m$^2$ (Tapitanga) (Figure 12.23).

The number of terrace units varies at these sites and is not directly related to site size. Some locations are more consolidated than others. Potaketake is 5744 m$^2$ and has ca. 30 terraces. Tapitanga has a similar number of terraces (ca. 42) dispersed over a much larger area (25,237 m$^2$). There is a tendency for terraces along flat ridgelines to be rectilinear in shape and those on steeper terrain to be d-shaped, a difference due primarily to the natural topography. Towers are commonly covered with dyke-stone masonry facades and rectilinear terraces are often reinforced by dyke-stone masonry walls. Sometimes, parallel series of dyke-stone blocks with a rubble or sediment-filled interior were used to reinforce these platforms. These walls were used to contain

Figure 12.23. Size and configuration of the primary Rapan fortifications. Drafted J. Bartruff and D.J. Kennett.
sediments cut from the ridgeline to create a large level living surface. None of these walls reach above the level of the terrace and they were not constructed to be weight-bearing. Structures made from perishable materials were built in the centres of these platforms, as indicated by the position of hearths (Mulloy 1965). Tapitanga and Ororangi stand out relative to the other fortifications on the island due to the general absence of visible dyke-stone masonry. The most extensive natural dyke-stone deposits are in the vicinity of Noogorupe and there is some evidence that these deposits were quarried. Determining the extent and character of dyke-stone deposits will provide key insights into dyke stone’s varied use in fortification construction across the island.

One of our main goals was to build a radiocarbon chronology for the primary fortifications on the island (Kennett et al. 2006). We collected radiocarbon samples from either natural exposures or test excavations at these sites. Thirty AMS radiocarbon dates place the initial fortification at Noogurope and Ruatara between AD 1300 and 1400. Morongo Uta appears to have been established between AD 1500 and 1600. This is followed by the proliferation of fortifications between AD 1700 and 1830. Most of the fortifications on the island were established during this interval and there was a general increase in the number of fortifications on Rapa after AD 1750. Work at Tapitanga and Potaketake (both overlooking Akatanui Bay) suggests that dyke-stone masonry developed after AD 1750 at Potaketake. Most sites with dyke-stone masonry have components that date after this time. Ororangi appears to be the only site dating to between AD 1750 and 1830 where masonry architecture was not used. Mulloy (1965) argued that terrace units were added as populations expanded at each location. Our budget did not allow us to test this hypothesis directly, but the dates at Morongo Uta conform to this expectation. More work will be needed to determine how these sites expanded. Three of the four smaller fortifications tested date to between 1750 and 1830 and support the hypothesis that populations were at a maximum when Vancouver encountered the island in AD 1791. Overall, these data support the hypothesis that populations on the island generally increased through time.

Mulloy (1965) argued that the hilltop sites were residential and not simply used as periodic refuges during times of war. This was based on large-scale cleaning and excavation at Morongo Uta, where he identified house platforms (terraces) with domestic features (hearth and ovens), residential debris (shell, bone, charcoal), and artefacts (e.g. adzes, poi pounders), indicating a range of daily activities. Our work at multiple locations is consistent with the hypothesis that these sites were residential. Hearths and ovens were encountered in most of our excavation units and our auger and sample test-pit excavations indicate that dark midden soils containing cultural materials cover these sites. Preservation in these deposits is poor, and wind deflation and water erosion are diminishing their integrity. Basalt adze flakes were commonly found during our excavations, but formal artefacts were rarely encountered in our units or on the exposed surfaces of these sites. Faunal materials were recovered from most of the sites excavated, but the assemblages are small and poorly preserved (see below). Mulloy (1965:53) estimated the population at Morongo Uta to be ca. 425 people, based on the number of terraces and hearths at the site, along with a conservative estimate of five people per household. This assumes that all 85 terraces were occupied at the time of its maximum extent between AD 1750 and 1830.

Future work on the chronologies of individual sites will be required, along with excavations at disassociated terraces on ridges and along valley walls, to determine what percentage of the population lived in these hilltop settlements and whether this changed through time.

We infer from paleoecological data (Prebble and Anderson, Chapter 10) and the remnants of prehistoric pondfields (Bartruff et al., Chapter 13) that the inhabitants of these hilltop settlements had invested heavily in, and were reliant on, wet taro agriculture in lowland
pondfields. The limited distribution of lowland environments suitable for this highly productive agricultural practice may be one reason they placed their settlements on ridgetops and ridgelines. However, the cost of transporting taro and other resources (marine foods and water) to upland locations was high and suitable water and food storage within these hilltop settlements would have been essential. Smaller terraces within these complexes may have served as platforms for above-ground storage facilities (Mulloy 1965). Large and small pits are also evident at most of these fortifications. Stokes (n.d.) observed large pits ranging in size between 1.8 m and 4.5 m. Some were as deep as 2.8 m. The best examples that we observed occur at Potaketake, Ruatara and Kapitanga, and in all cases these pits were excavated into terraces on the outer flanks of the radiating terrace units. Based on ethnographic data, Stokes (n.d.) argued that these pits were lined with banana leaves, filled with crushed taro, sprinkled with water, and covered with ti leaves and a layer of sediment (pp. 174–175). Future excavations should target these pits to determine their character and collect sediment samples for microbotanical analysis.

In East Polynesia, agricultural produce was commonly combined with meat from introduced domesticated animals (e.g. chickens, pigs) or marine foods (shellfish and fish). Faunal remains were not well preserved in the acidic soils of these highly exposed sites. The use of 2 mm screens to process sediments in the field helped us identify sediments with reasonable faunal preservation, which were then taken in bulk for flotation. A total of 400 bones representing 10 different vertebrate taxa were identified using this method (see Butler, Appendix C). The results from five different fortifications indicate the greatest reliance on near-shore reef fishes, with parrotfishes (Scoridae) the most represented species. This is consistent with the use of stone fish traps that are common along the shores of the island. The best-recorded example comes from the northern edge of Ha’urei Bay (Ferdon 1965:13). Other carnivorous fish species were also present in small numbers (groupers, snappers, moray eels) and suggest the use of hook and line fishing. The only larger animal identified in these assemblages was an unidentified species of sea turtle in the tower deposits at Tapitanga. Domestic animals were noticeably absent and rats were the only introduced animal species identified in these assemblages. Overall, the faunal data is suggestive of near-shore fishes supplying the primary source of protein on the island.

Political hierarchies and status rivalries were common throughout East Polynesia. Hereditary chiefs controlled access to land and competed with rival chiefs to expand territorial boundaries and improve food security for their kin (Vayda 1976; Kirch 1984). The notion of political and social hierarchy was certainly carried to Rapa, but it only becomes apparent archaeologically with the establishment of the Noogurope and Ruatara fortifications between AD 1300 and 1400. The appearance of two fortified villages signals a status rivalry between two competing polities with chiefly lineages at their core. The structural organisation of these fortifications also reflects this hierarchy. Stokes (n.d.) argued that the flattened tops of each tower served as the platform for the chief’s residence and that his closest kin lived in the upper surrounding terraces. We identified dark midden soils on the tops of the intact towers that were similar to those found on lower domestic terraces (e.g. charcoal, adze flakes). Faunal materials were also identified on the tops of Ruatara, Ororangi and Tapitanga. An oven similar to the one identified by Stokes (n.d.) on the tower at Morongo Uta was identified on the northwestern portion of Ororangi’s tower. These data are consistent with the idea that the flattened tower tops served as at least one residential component of the chief’s quarters. The presence of sea-turtle bones on the tower at Tapitanga is consistent with this interpretation, given their role as chiefly food elsewhere in Polynesia (Anderson pers. comm.). When combined with site distributions and the radiocarbon ages, these data suggest that there were 10 competing chiefly lineages on the island in the century before European contact. Our work on secondary fortifications is also suggestive
of subordinate chiefly lineages living in satellite communities that were integrated into larger political systems during the final phase of fortification.

Walczak (2001) has questioned the idea that the hilltop settlements on Rapa were fortifications constructed in the context of inter-tribal warfare between competing chiefdoms. Instead, he argued that these structures were primarily ritual in nature. Certainly, household shrines at Morongo Uta point to the important role of ritual in Rapan society, and the very nature of East Polynesian hierarchies is imbued with a ritual dimension that served to legitimise established social and political orders. But establishing a functional dichotomy between ritual and residence obscures the primary observation that these sites were first and foremost both inhabited and defended. Chiefs were often accomplished warriors (Kirch 1984:196) and struggles over power and land often resulted in war (Williamson 1937). Stokes’ (n.d.) ethnographic data from the 1920s, especially his record of Rapan traditions (Chapter 2), make it clear that war for land and food stores was an important part of Rapan life. The strategic position of these sites, combined with the presence of defensive features (e.g. fosses), is consistent with this interpretation. Sites dating to the century before missionisation in 1830 tend to have more defensive features (e.g. Morongo Uta, Potaketake, Kapitanga), and some of these features appear to have been cut through existing architecture, suggesting that the incidence or severity of war was increasing. The higher-elevation refugia sites (Ngapiri and Pukumia) also suggest increased hostilities late in the Rapan sequence. This is consistent with Vancouver’s observations that people on Rapa were living in hyper-fortified hilltop communities surrounded by multiple rows of palisades.

Our research was necessarily limited to a few important objectives, notably of chronology and general site function. We have argued that the fortified sites need to be seen primarily in that role, as defended villages, and that the broad history of their construction is consistent with rising levels of population, inter-group competition and hostility, probably most particularly over access to agricultural lands. This situation continued, and possibly was becoming increasingly tense, into the early European era.

Note
1. Walczak (2001) visited and mapped Ngapiri, Namuere, Pukutaketake, Tevaitau, Ungareere, Ororangi and Ruatara in the late 1990s. He also excavated Tevaitau (10 units, 50 cm²), Ngapiri (2 units, 1 m²), Ruatara (1 unit, 2 m²) and Ororangi (1 unit, 2 m²). Only the excavations at Tevaitau are described in detail.

References


