

4

The An Sôn Excavation of 2009

Introduction

A brief introduction to the 2009 excavation, the geography and the environment at An Sôn was provided in Chapter 1. This chapter introduces the previous excavations at An Sôn, and discusses the stratigraphy, chronology, material culture, burials, and floral and faunal remains recovered from the 2009 excavation.

The 1978 An Sôn trenches were located on top of and east of the mound. The trench on the top of the mound was excavated to a depth of 4.5 m. The subsequent excavation by Nishimura and Nguyễn (2002) in 1997 was located on top of the mound at its eastern end. Like the mound-top trench in 1978, the 1997 Trench 1 was excavated through the mound to a depth of 4.0 m. This trench revealed a series of horizontal layers that were divided into three main stratigraphic units, of which the basal appears to have been created from the alluvial palaeosol that underlies all of the An Sôn excavation trenches. The stratigraphy of the 1997 Trench 1 excavation displayed a large number of alternating alluvial silt floors separated by occupation layers (Figure 4.1). The floors appear to have supported ground level houses with posts set in holes up to 0.5 m deep, although no precise house plans could be reconstructed. Many fired clay lumps were observed in clusters in hearths and were assumed to be from pottery making, although our 2009 observations favour the use of these low-fired clay lumps as heat retainers during cooking.

The excavations of 2004 and 2007 were directed at the eastern margin of the mound, which had revealed promising evidence of burials (Vân *et al.* 2008; Phạm 2006). This was where the subsequent excavations of 2009 were also targeted. In 2009, three trenches were laid out close to the 2004 trenches with the intention of locating and excavating more burials. Trench 1 was 3 by 12 m, Trench 2 was 5 by 5 m, and Trench 3 was 2 by 10 m in size. Each of these trenches was divided into squares of 1 by 1 m for the purposes of recording, as described in Chapter 3. The location of these trenches is shown in the plan of Figure 4.2.

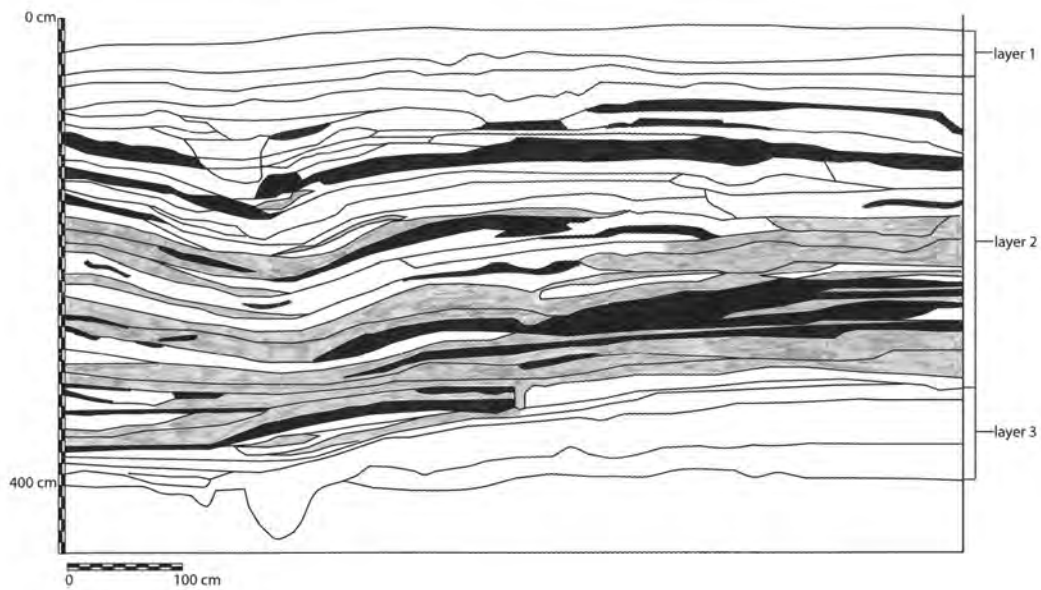


Figure 4.1. Trench 1, 1997 excavation, stratigraphy. Black areas are compact layers. Grey areas are loose layers. White layers are between compact and loose densities.

Source: Illustration, C. Sarjeant (After: Nishimura and Nguyễn 2002: 103, figure 3).

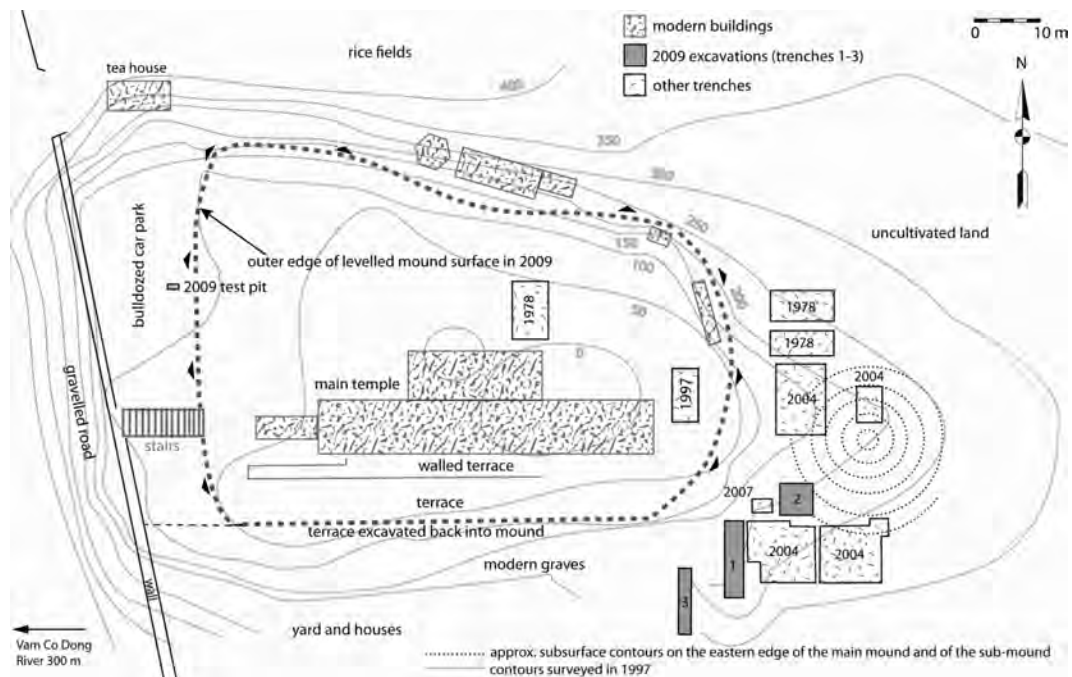


Figure 4.2. Plan of the excavation trenches at the mound of An Son.

Source: Illustration, P. Bellwood.

Stratigraphy

This section reports the stratigraphy of the three main 2009 excavation trenches, Trenches 1, 2 and 3. The additional 2 by 2 metre Test Square cut into the western side of the mound displayed similar stratigraphy and ceramic material to the middle and lower layers (layers 5 to 8) in Trench 1. The soil in the lowest deposit of the Test Square changed the colour of some of the ceramics from a red or orange colour to grey or black. The Test Square was deeper than the excavations on the eastern side of the mound, extending to a depth of 2.6 m, but it was cut into the side of the mound rather than from its surface.

The horizontal floors observed in the 1997 excavations (Figure 4.1) into the core of the mound were not visible in the 2009 excavations. The 2009 excavation Trench 1 revealed layers deposited due to dumping of cultural material down the slope of the mound. Most of this material consisted of ceramic sherds, and it is thought that these deposits continue around all sides of the mound. The major deposits in Trench 1 were within layers 4 to 7, over the palaeosol, layer 8 (Figure 4.3, Table 4.1). Some of these layers sloped from north to south at angles of 30 degrees or more.

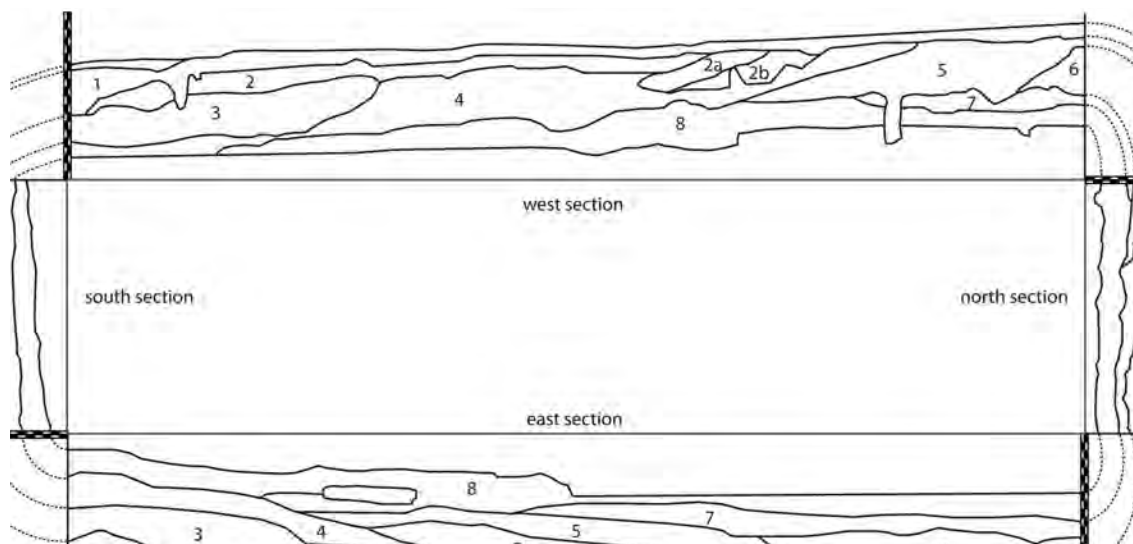


Figure 4.3. Trench 1, stratigraphy. Main mound is towards the northwest.

Source: Illustration, C. Sarjeant (After: Võ Thanh Hương).

Table 4.1. Trench 1, description of layers.

Layer	Munsell soil colour
1	Hue 7.5YR 6/4 dull orange
2	Hue 5YR 3/3 dark reddish brown
3	Hue 5YR 4/6 reddish brown
4	Hue 5YR 4/1 brownish grey
5	Hue 7.5YR 5/4 dull brown
6	Hue 5YR 5/6 bright reddish brown
7	Hue 7YR 6/4 dull orange
8	Hue 5YR 4/2 greyish brown

Source: Compiled by C. Sarjeant.

The upper layers of 2009 Trench 2 had been removed before 2004 during ground-leveling earthwork activities to build unsuccessful and now abandoned rice fields. In the northeastern corner, Trench 2 contained a smaller, subsidiary mound. The western margin of the excavation trench revealed layers that sloped consistently with the main mound that showed clear signs of pyroclastic activity. This was the oldest feature in Trench 2, and was surrounded by sloping layers that had built up around it. This sub-mound indicates that sites like An Sơn may have not accumulated from only one point. In the case of this sub-mound, its original function is suggested by the many concretions of semi-vitreous material in basal layers 14 and 11 (Figure 4.4, Table 4.2), with a virtual absence of any other cultural material. These vitreous materials are presumably cinders of mixed organic material, including fat and bone, produced during intensive cooking in earth ovens. No chemical analysis of these vitreous materials has yet been undertaken but this research is planned.

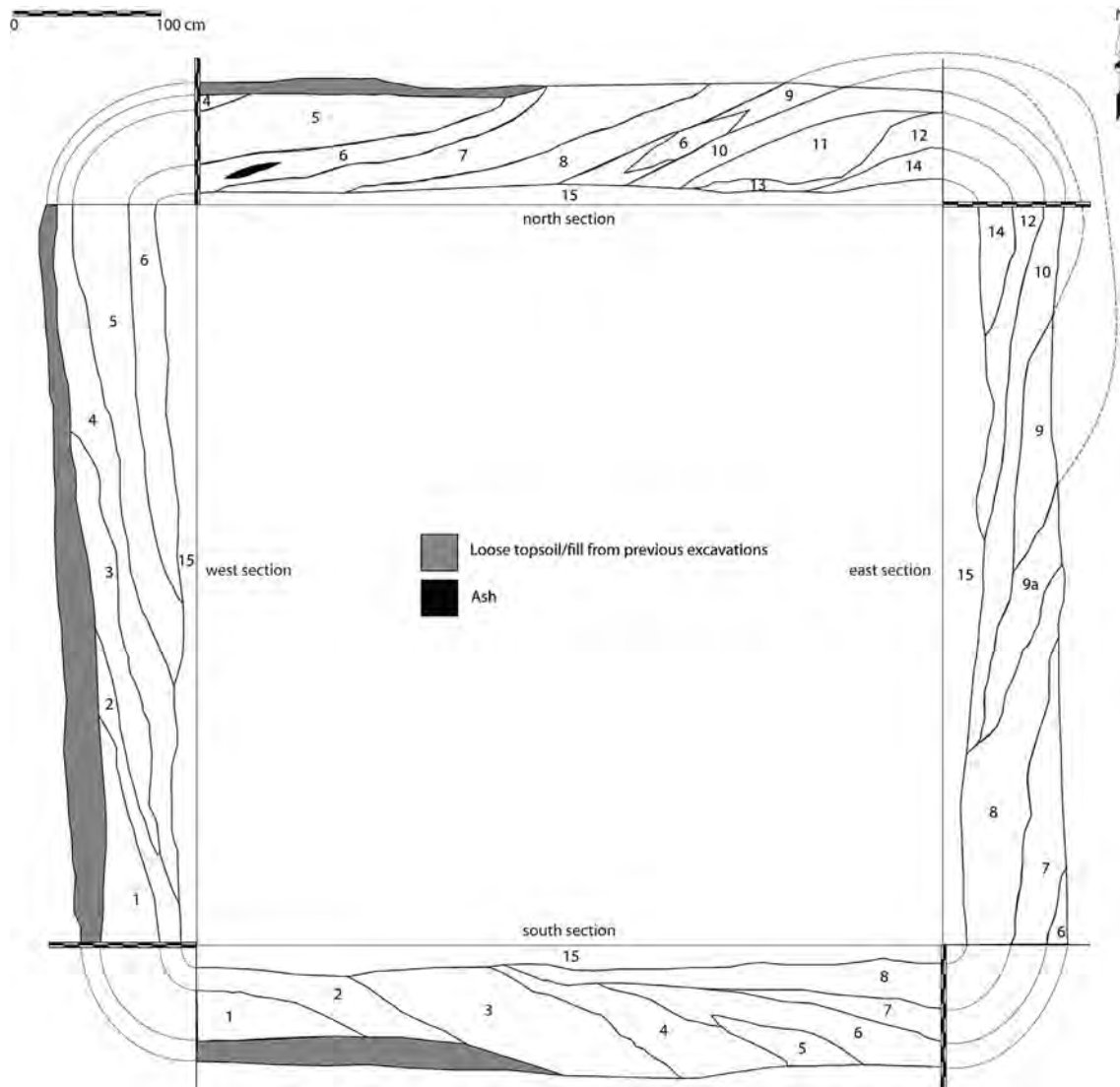


Figure 4.4. Trench 2, stratigraphy. Subsidiary mound is in the northeast corner. Main mound is towards the northwest.

Source: Illustration, C. Sarjeant (After: Võ Thanh Hương).

Table 4.2. Trench 2, description of layers.

Layer	Munsell soil colour
previous excavation fill/topsoil	Hue 7.5YR 8/3 light yellow orange
1	Hue 5YR 4/4 dull reddish brown
2	Hue 5YR 4/4 dull reddish brown
3	Hue 5YR 2/4 very dark reddish brown
4	Hue 5YR 4/3 dull reddish brown
5	Hue 5YR 2/2 brownish black
6	Hue 5YR 4/4 dull reddish brown
7	Hue 5YR 4/6 reddish brown
8	Hue 5YR 4/4 dull reddish brown
9	Hue 5YR 4/5 reddish brown
10	Hue 5YR 3/3 dark reddish brown
11	Hue 5YR 4/4 dull reddish brown
12	Hue 5YR 4/2 greyish brown
13	Hue 5YR 8/2 light grey
14	Hue 5YR 2/2 brownish black
15	Hue 5YR 4/1 brownish grey

Source: Compiled by C. Sarjeant.

Trench 3 contained an internally unstratified deposit, consisting of clay and many small sherds. This deposit had been washed off the main mound by rainfall, with the light particles of clay being transported in suspension and the heavier sand and silt left behind to form the deposit that surfaces the mound today. A similar mass of transported clay and small sherds also occurred in the southern end of Trench 1. No original mound layers intersected Trench 3, with the possible exception of layer 4 (Figure 4.5, Table 4.3). In fact, Trench 3 yielded little archaeological information of value, except for clusters of pots in the basal layer. One of these clusters was associated directly with the sherd residue date of 3880 ± 40 BP (2471–2209 cal. BC) (Table 4.4, Figure 4.6). This date refers to the possible initial settlement in this area of the site, and is similar to the basal dates recovered from Trench 1 in 1997 (Nishimura and Nguyễn 2002: 107, table 1) (Table 4.4). It also parallels a basal date of 3950 ± 75 BP (2834–2203 cal. BC, OxCal 4.1.7, 95.4%) for the nearby site of Lộc Giang, excavated by a team led by Bùi Chí Hoàng in 1988 and 1993 (Nishimura and Nguyễn 2002).

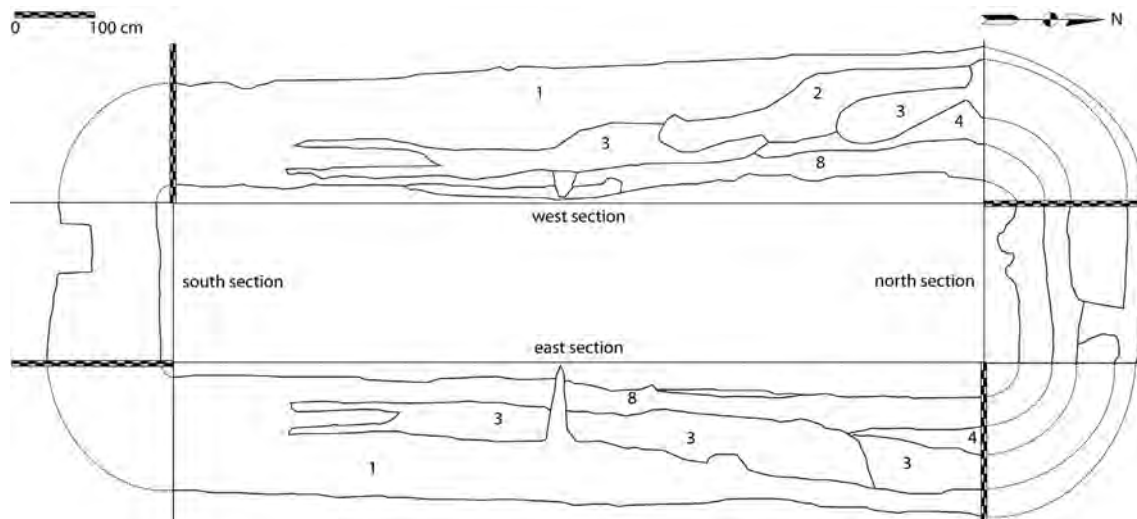


Figure 4.5. Trench 3, stratigraphy. Main mound is towards the north.

Source: Illustration, C. Sarjeant (After: Võ Thanh Hương).

Table 4.3. Trench 3, description of layers.

Layer	Munsell soil colour
1	Hue 5YR 3/2 dark reddish brown
2	Hue 5YR 3/4 dark reddish brown
3	Hue 5YR 3/4 dark reddish brown
4	Hue 7.5YR 4/6 brown
8	Hue 7.5YR 5/4 dull brown

Source: Compiled by C. Sarjeant.

Chronology

The neolithic sequence for An Sơn extended for approximately 1000 years. Initial occupation has been estimated to date to 2500–2200 cal. BC, on the basis of charcoal radiocarbon determinations from palaeosol contexts in Trench 2, and food residue dates from ceramic sherds from the base of Trench 3 (Bellwood *et al.* 2011). The majority of the occupation layers excavated in 1997 (Nishimura and Nguyễn 2002) and observed in 2009 Trench 1 are presumed to date to 1900–1500 cal. BC (Bellwood *et al.* 2011). The excavated burials, which were cut through the supervening layers, were most likely contemporary with the latest recorded phase of occupation. These burials were dated by AMS from tooth enamel and produced a very tight chronology of approximately 1500–1200 cal. BC, with the later dates suggestive of the termination of the neolithic period at An Sơn (Bellwood *et al.* 2011). Two marine shell dates (*Turitella balillum*) of 2775 and 2855 uncalibrated BP, from the 1978 excavations, apparently came from a depth of 3.4 m in the mound-top trench (Lê 1978). However these are much younger than any C14 samples analysed in 1997 or 2009, especially with marine reservoir correction, and are thus very hard to explain unless they relate to disturbance or laboratory error (Table 4.4, Figure 4.6).

Table 4.4. Radiocarbon dates for all excavations at An Son, 1978–2009.

An Son excavation year	Sample context	Sample identification number	Material	δ13C	% modern carbon	14C age (BP)	OxCal 4.1, 95% cal. age (BC)
2009	09 AS TS 230–240	AMS ANU 9709	residue on sherd	-21.97	60.88±0.57	3990±80	2862–2234
	09 AS H3 L12 B5	AMS ANU 9711	residue on sherd	-35.69	61.72±0.25	3880±40	2471–2209
	09 AS H2 A1 palaeosol	AMS ANU 10105	charcoal	-19.45	62.14±0.26	3825±40	2459–2144
	09 AS H2 C4 palaeosol	AMS ANU 9712	charcoal	-30.13	64.08±0.20	3580±30	2028–1786
	09 AS H2 D5 palaeosol	AMS ANU 13012	charcoal	-28.5	65.12±0.20	3450±30	1880–1688
	09 AS H2 C4 50–60	AMS ANU 9710	freshwater shell	-18.15	65.76±0.22	3370±40	1750–1531
	97 Layer 3–5	Tka 11541	charcoal	N/A	N/A	3990±190	3011–1964
	97 Layer 3–5	Tka 11526	charcoal	N/A	N/A	3840±40	2461–2155
	97 Layer 3–4	ANU 10880	charcoal	N/A	N/A	3820±70	2471–2041
1997	97 Layer 3–5	Tka 11817	charcoal	N/A	N/A	3780±120	2566–1892
	97 Layer 3–5	Tka 11816	charcoal	N/A	N/A	3690±80	2341–1880
	97 Layer 3–1	Tka 11822?	charcoal	N/A	N/A	3390±80	1890–1501
	97 Layer 2–17	ANU 10881	charcoal	N/A	N/A	3370±80	1884–1496
	97 Layer 2–21B	Tka 11821	charcoal	N/A	N/A	3320±130	1946–1316
	97 Layer 3–3	Tka 11823	charcoal	N/A	N/A	3310±110	1890–1387
	97 Layer 3–2	Tka 11824	charcoal	N/A	N/A	3310±90	1874–1414
	97 Layer 2–17	Tka 11820	charcoal	N/A	N/A	3310±90	1874–1414
	97 Layer 2–14	Tka 11822?	charcoal	N/A	N/A	3200±90	1690–1265
	97 Layer 2–12	Tka 11819	charcoal	N/A	N/A	3190±110	1741–1133
	04 AS H3 M10a	NZA 34102	tooth enamel	-14.2	66.40±0.22	3231±25	1534–1431
	04 AS H3 M14a	NZA 34110	tooth enamel	-13.8	66.58±0.22	3209±25	1518–1429
	04 AS H3 M8a	NZA 34101	tooth enamel	-14.1	66.66±0.23	3199±25	1511–1424
	04 AS H3 M13a	NZA 34109	tooth enamel	-13.6	66.77±0.22	3187±25	1499–1415
	04 AS H3 M3a	NZA 34100	tooth enamel	-13.7	66.93±0.22	3168±25	1495–1408
Human burials 2004/2009	09 AS H1 M1a	NZA 34050	tooth enamel (cranium only)	-13.4	67.08±0.22	3149±25	1492–1387
	09 AS H1 M3a	NZA 34173	tooth enamel	-13.5	67.41±0.17	3109±20	1431–1314
	09 AS H1 M2a	NZA 34172	tooth enamel	-14.2	67.83±0.18	3060±20	1397–1267
	07 AS H1 M3a	NZA 34112	tooth enamel	-13.2	68.26±0.22	3009±25	1376–1130
	04 AS H3 M1a	NZA 34092	tooth enamel	-13.2	68.62±0.22	2967±25	1297–1113
	04 AS H3 M17a	NZA 34111	tooth enamel	-13.4	68.72±0.21	2956±25	1264–1054
	09 AS H2 M3a	NZA 34174	tooth enamel	-13.8	68.74±0.17	2953±20	1262–1057
	78 AS HII inner fraction	Bin-2091 II	marine shell	N/A	N/A	2855±80	1263–836
	78 AS HII	Bin-2091 I	marine shell	N/A	N/A	2777±80	1189–798

Source: Bellwood et al. 2011; Nishimura and Nguyễn 2002; Lê 1978. Calibrated with OxCal v4.1.7 (Bronk Ramsey 2010; Reimer et al. 2009).

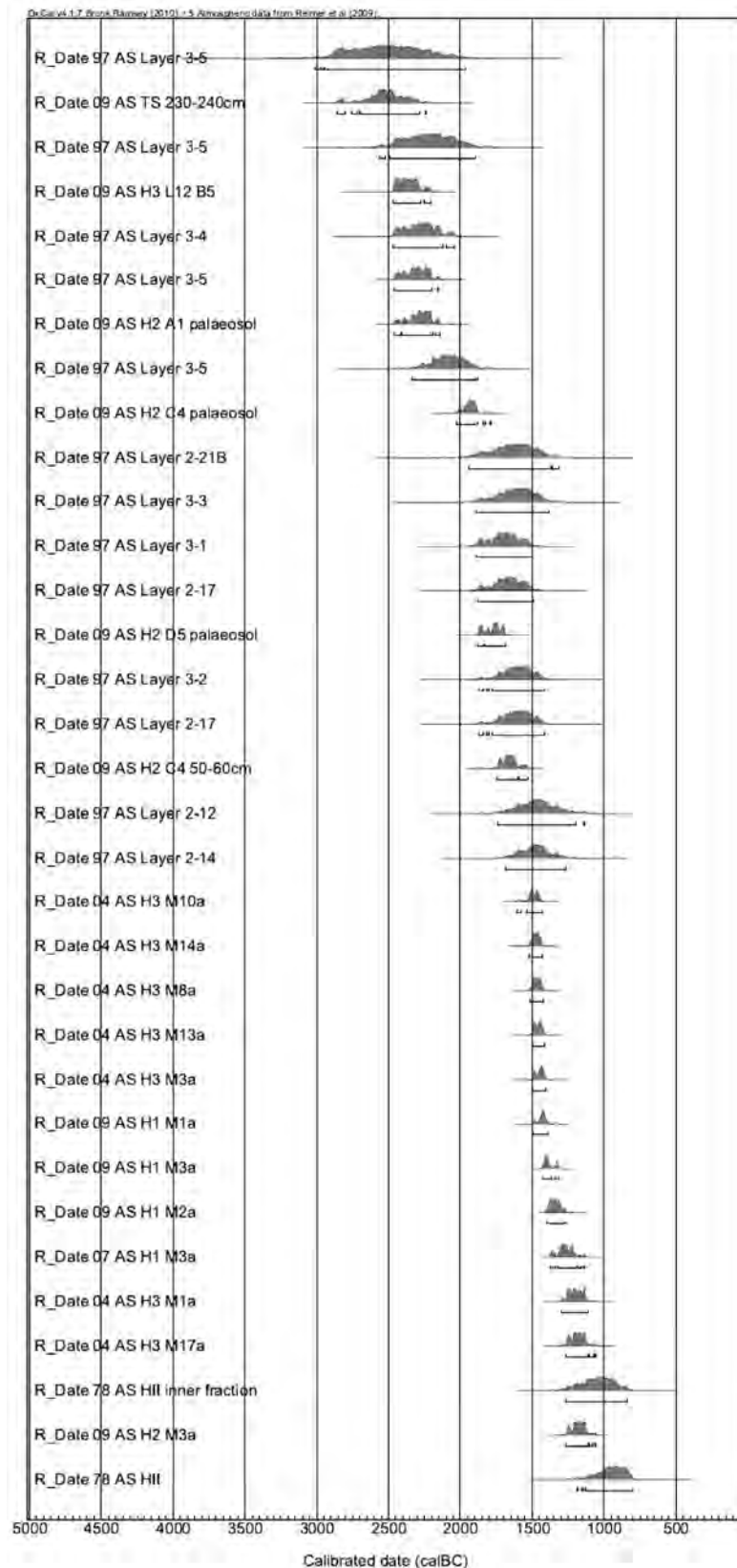


Figure 4.6. Plot of the calibrated radiocarbon dates in Table 4.4.

Source: Calibrated with OxCal 4.1.7 (95% probability) (Bronk Ramsey 2010; Reimer *et al.* 2009).

Material culture

This section discusses the material culture recovered during the 2009 excavation at An Sơn, including pottery, clay artefacts, lithics, shell items, bone, ivory and other items.

Ceramic sherds

While this section introduces the An Sơn ceramic assemblage, in-depth analyses are presented in Chapters 5, 6 and 7. The entire ceramic assemblage weighed 2618 kg (Figure 4.7) and consisted of 230,848 earthenware sherds (Figure 4.8). The majority (1600 kg) of the sherds were excavated from Trench 1. The highest concentration of ceramic sherds was in layer 5 of Trench 1, particularly in squares A1 to A8 and B1 to B7, close to the main mound (Figure 4.9, Figure 4.10, Figure 4.11, Figure 4.12, Figure 4.13, Figure 4.14). The concentrations were less in Trench 2, and were mainly in layers 3 to 4 in squares C3–C5, D3–D5 and E3–E5, and layers 4 to 6 in E1–E3, again close to the main mound (Figure 4.15, Figure 4.16, Figure 4.17, Figure 4.18, Figure 4.19, Figure 4.20, Figure 4.21, Figure 4.22, Figure 4.23, Figure 4.24). The highest concentration of ceramics in Trench 3 was in layers 2 and 6 in A1–A4 and B1–B4, close to the main mound (Figure 4.25, Figure 4.26, Figure 4.27, Figure 4.28).

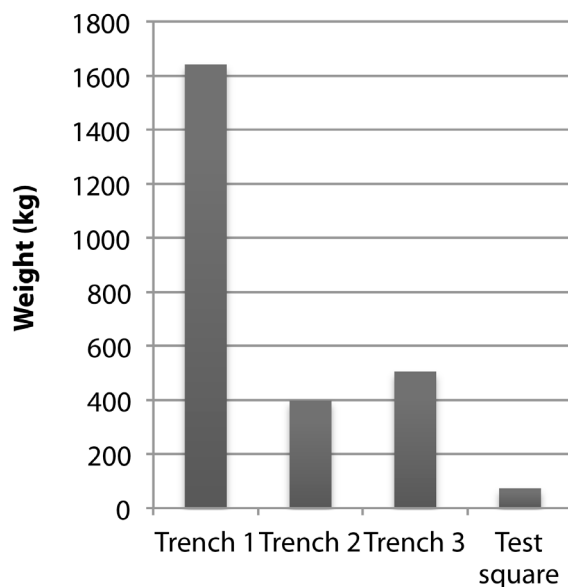


Figure 4.7. Total weight (kg) of ceramic sherds in each trench, total = 2618.13 kg.

Source: C. Sarjeant.

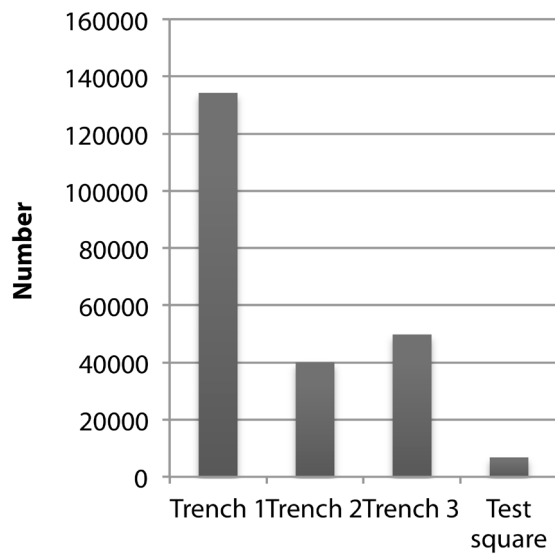


Figure 4.8. Total number of ceramic sherds in each trench, total = 230,848.

Source: C. Sarjeant.

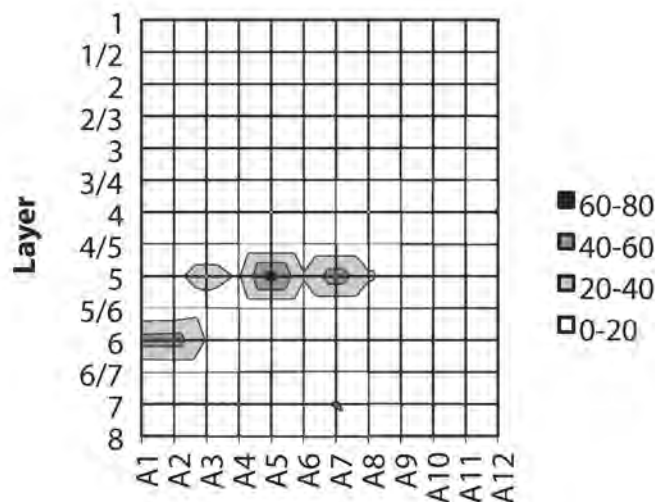


Figure 4.9. Distribution of ceramic sherds, Trench 1, squares A1–A12, weight (kg) per square.

Source: C. Sarjeant.

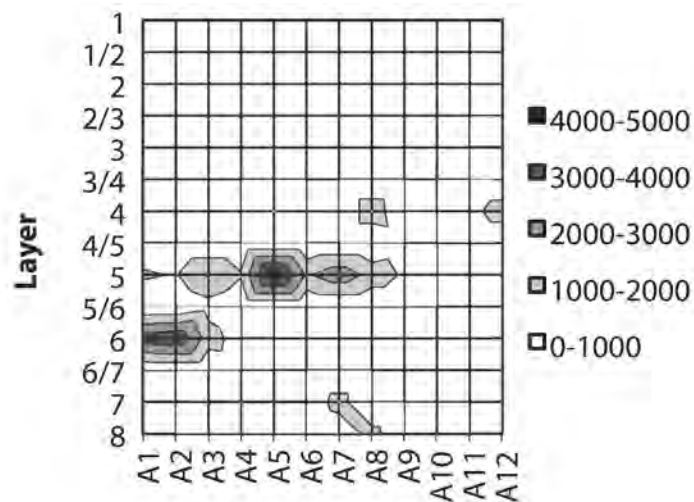


Figure 4.10. Distribution of ceramic sherds, Trench 1, squares A1–A12, number of sherds per square.

Source: C. Sarjeant.

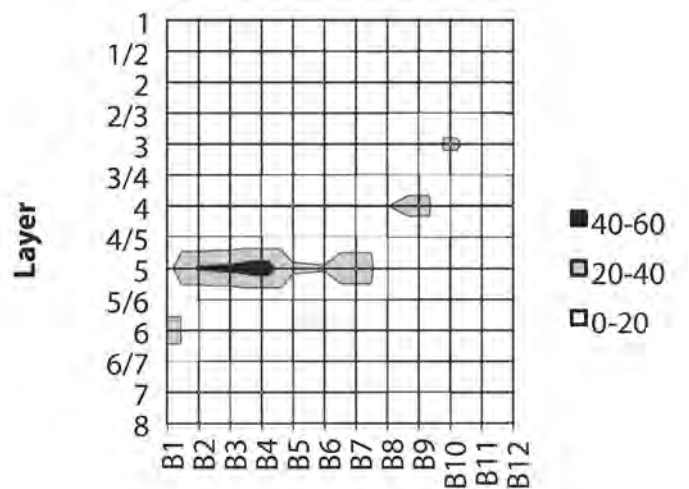


Figure 4.11. Distribution of ceramic sherds, Trench 1, squares B1–B12, weight (kg) per square.

Source: C. Sarjeant.

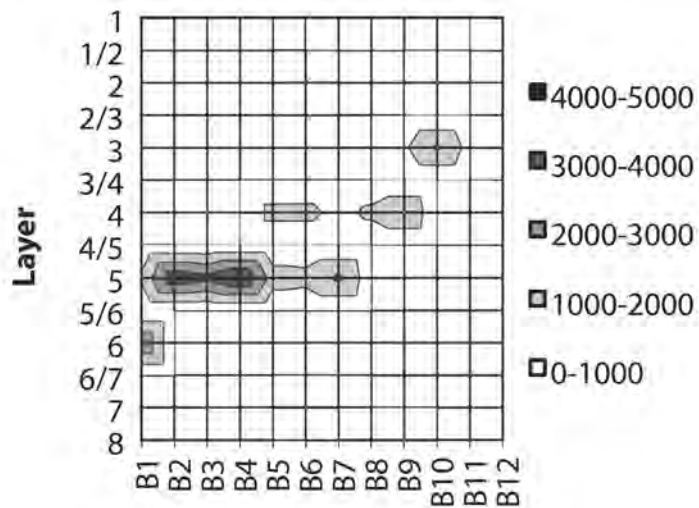


Figure 4.12. Distribution of ceramic sherds, Trench 1, squares B1–B12, number of sherds per square.

Source: C. Sarjeant.

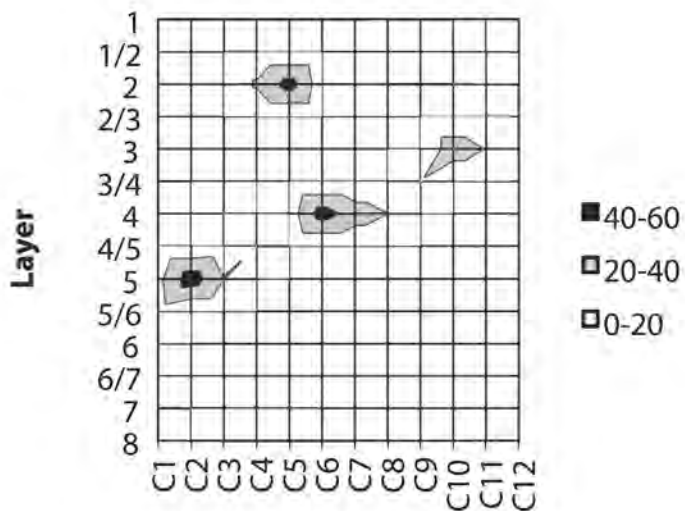


Figure 4.13. Distribution of ceramic sherds, Trench 1, squares C1–C12, weight (kg) per square.

Source: C. Sarjeant.

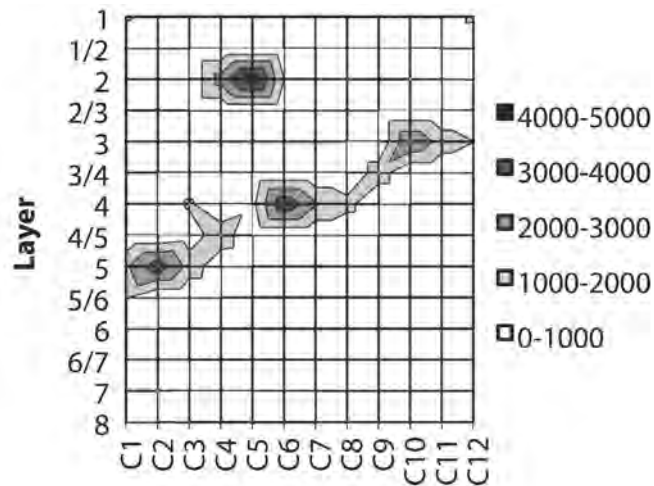


Figure 4.14. Distribution of ceramic sherds, Trench 1, squares C1–C12, number of sherds per square.

Source: C. Sarjeant.

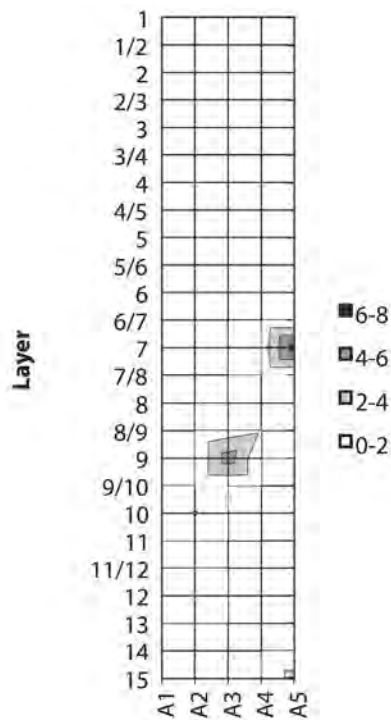


Figure 4.15. Distribution of ceramic sherds, Trench 2, squares A1–A5, weight (kg) per square.

Source: C. Sarjeant.

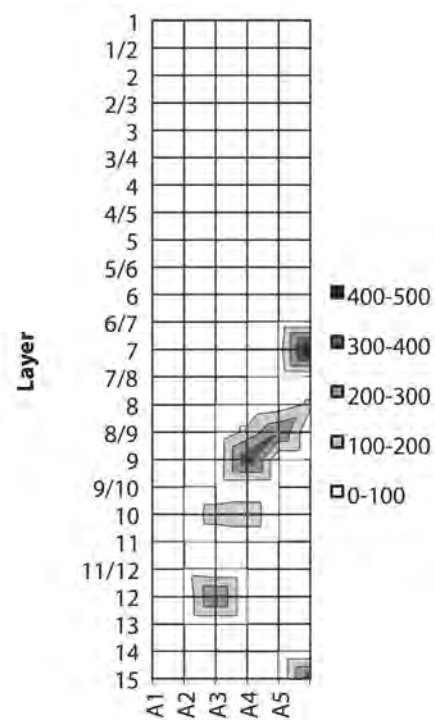


Figure 4.16. Distribution of ceramic sherds, Trench 2, squares A1–A5, number of sherds per square.

Source: C. Sarjeant.

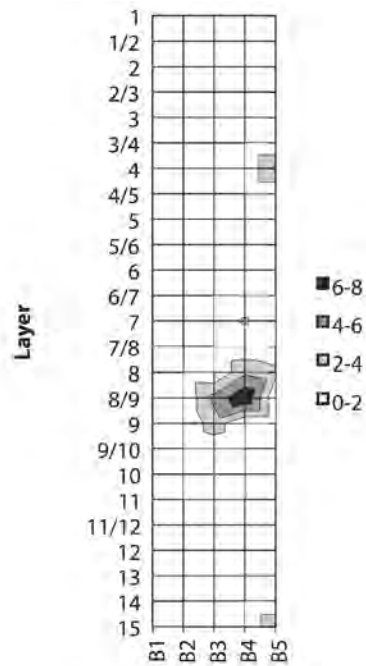


Figure 4.17. Distribution of ceramic sherds, Trench 2, squares B1–B5, weight (kg) per square.

Source: C. Sarjeant.

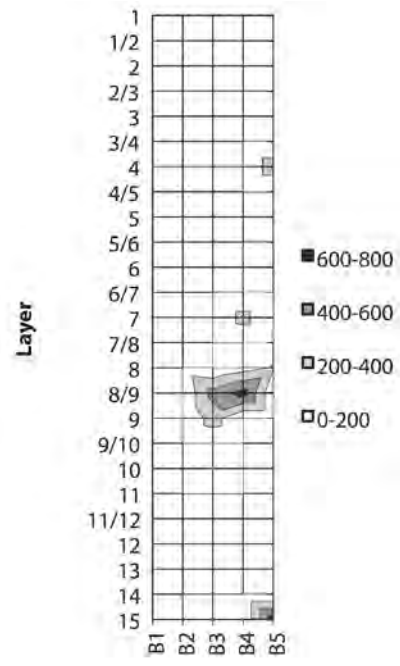


Figure 4.18. Distribution of ceramic sherds, Trench 2, squares B1–B5, number of sherds per square.

Source: C. Sarjeant.

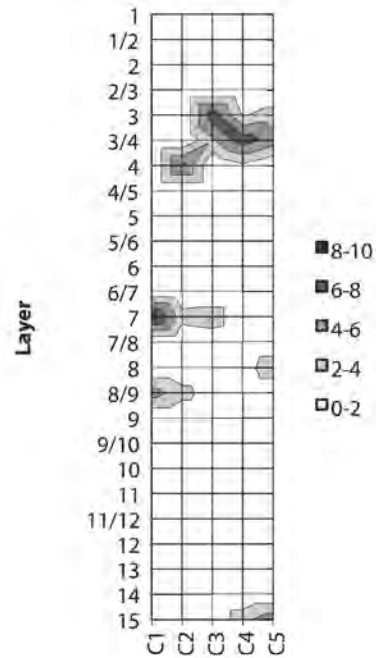


Figure 4.19. Distribution of ceramic sherds, Trench 2, squares C1–C5, weight (kg) per square.

Source: C. Sarjeant.

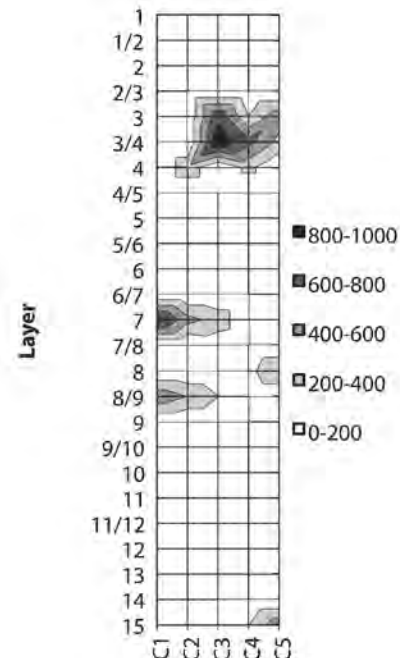


Figure 4.20. Distribution of ceramic sherds, Trench 2, squares C1–C5, number of sherds per square.

Source: C. Sarjeant.

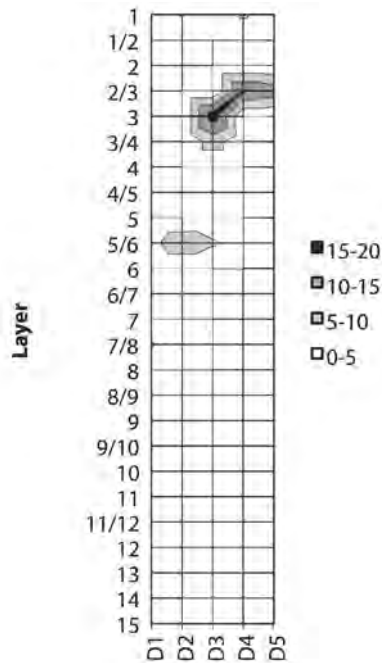


Figure 4.21. Distribution of ceramic sherds, Trench 2, squares D1–D5, weight (kg) per square.

Source: C. Sarjeant.

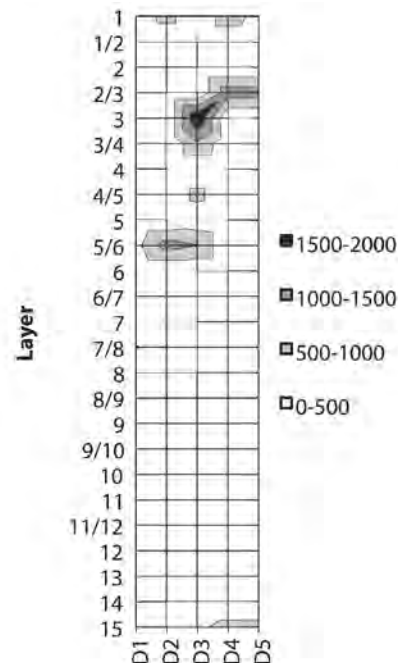


Figure 4.22. Distribution of ceramic sherds, Trench 2, squares D1–D5, number of sherds per square.

Source: C. Sarjeant.

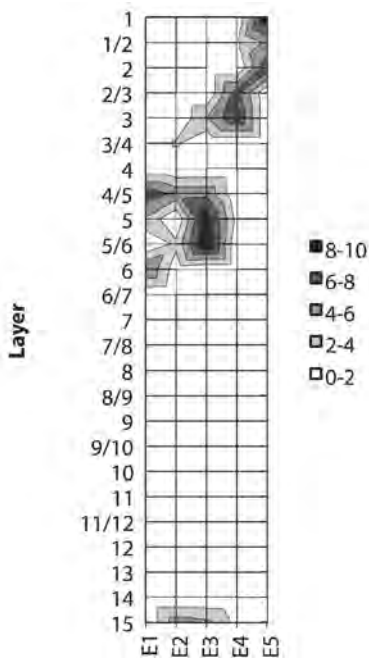


Figure 4.23. Distribution of ceramic sherds, Trench 2, squares E1–E5, weight (kg) per square.

Source: C. Sarjeant.

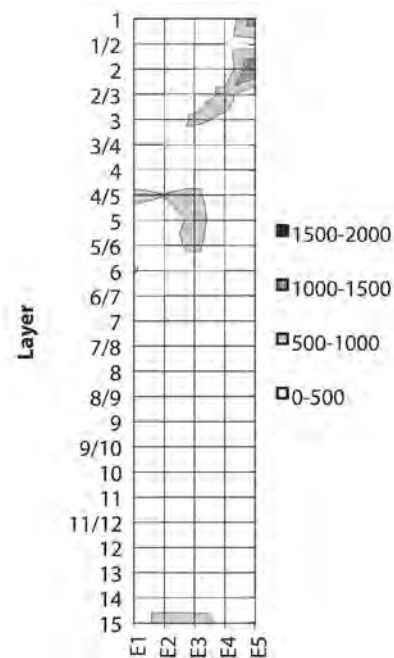


Figure 4.24. Distribution of ceramic sherds, Trench 2, squares E1–E5, number of sherds per square.

Source: C. Sarjeant.

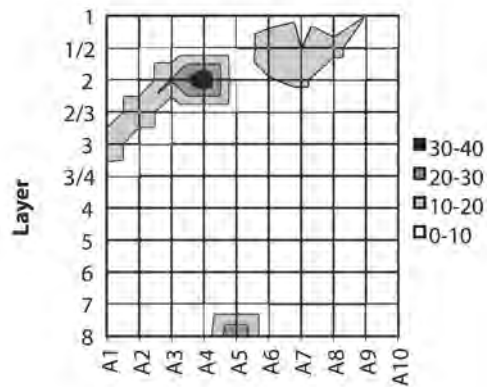


Figure 4.25. Distribution of ceramic sherds, Trench 3, squares A1–A10, weight (kg) per square.

Source: C. Sarjeant.

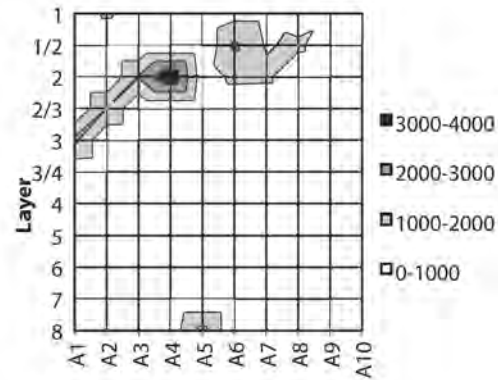


Figure 4.26. Distribution of ceramic sherds, Trench 3, squares A1–A10, number of sherds per square.

Source: C. Sarjeant.

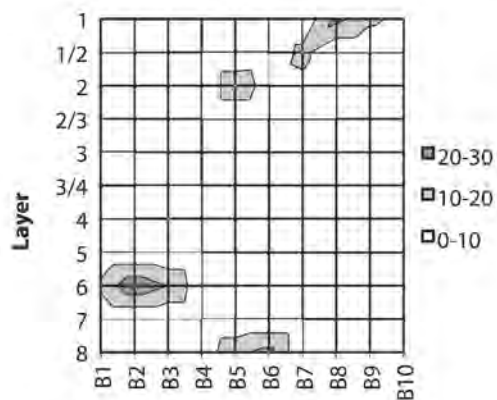


Figure 4.27. Distribution of ceramic sherds, Trench 3, squares B1–B10, weight (kg) per square.

Source: C. Sarjeant.

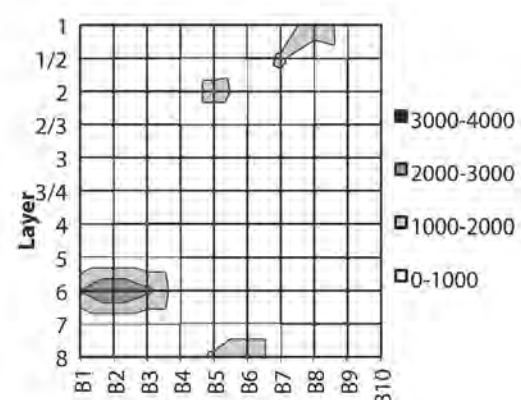


Figure 4.28. Distribution of ceramic sherds, Trench 3, squares B1–B10, number of sherds per square.

Source: C. Sarjeant.

Fired clay lumps

The clay lumps were low-fired, sometimes with fibre temper inclusions, hand-moulded and often about palm-sized. It is likely they were used during cooking activities, due to the presence of *cà ràng* (stove/earth oven cooking) vessels and burnt midden in dense concentrations with the lumps in Trench 2. The clay lumps varied in shape and some had clearly been pressed against *cà ràng* projections before they were fired (Figure 4.29). Other clay lumps had holes and may have been attached or hung in some way. Other evidence to support the use of such clay lumps in cooking activities comes from Çatalhöyük in central Turkey, where Atalay and Hastorf (2006)

identified different cooking uses for clay lumps (or balls, as they refer to them). These included processing foods by heating the clay balls to parch and toast seeds, grains and pulses in woven baskets, boiling bones in skins or baskets with the clay balls to extract grease, using the heated balls to transfer heat when boiling in baskets and skins, roasting rhizomes and meat in pits, and baking plant and animal products in enclosed oven environments with heated clay balls (Atalay and Hastorf 2006).

A total of 340.5 kg of clay lumps was collected from Trench 1 (Figure 4.30). These lumps were primarily from layer 5, which was also dense in ceramic sherds. The clay lumps from Trench 2 were primarily from layers 1 to 5 in squares C1 and E4 (Figure 4.31, Figure 4.32). No clay lumps were recovered from Trench 3 or the Test Square.



Figure 4.29. Clay lumps that have been pressed against *cà rang* projections. Top: Trench 1, layer 3–4, A8; bottom: Trench 1, layer 4, A7.

Source: Photos by C. Sarjeant.

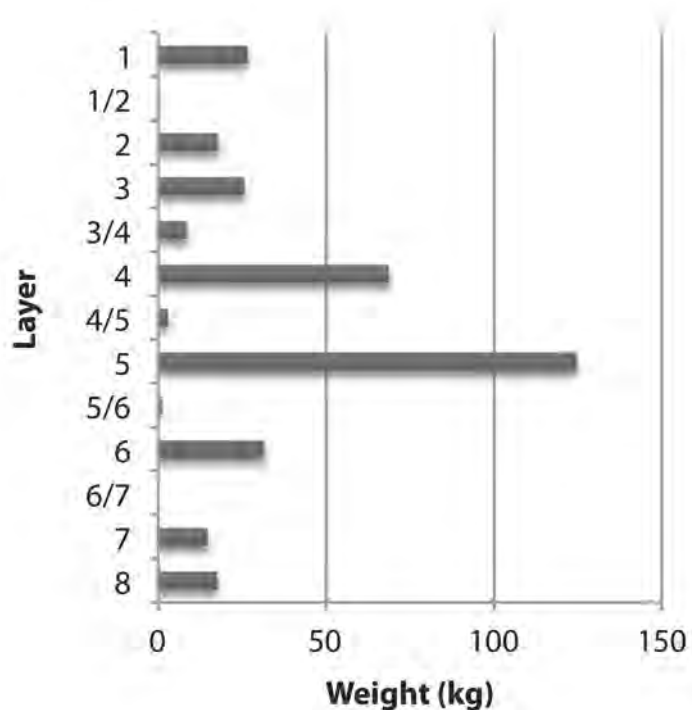


Figure 4.30. Weight (kg) of clay lumps, Trench 1 by layer, total = 340.50 kg.

Source: C. Sarjeant.

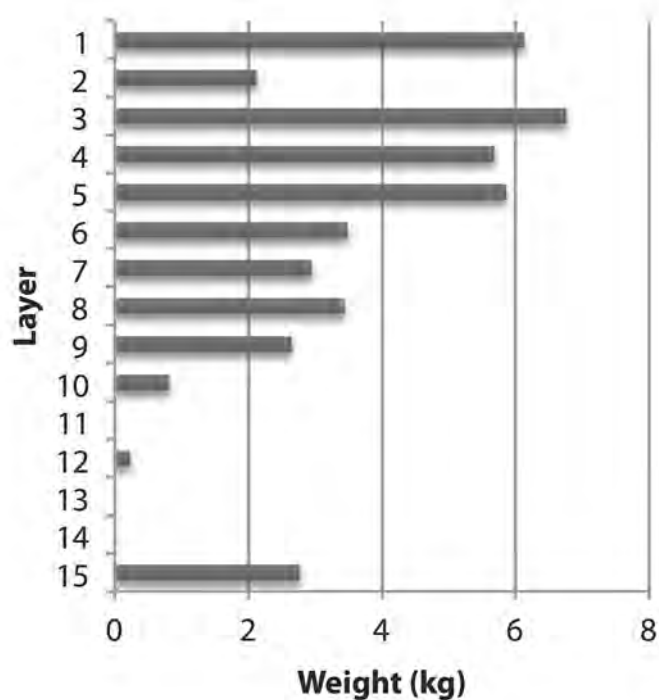


Figure 4.31. Weight (kg) of clay lumps, Trench 2 by layer, total = 42.87 kg.

Source: C. Sarjeant.

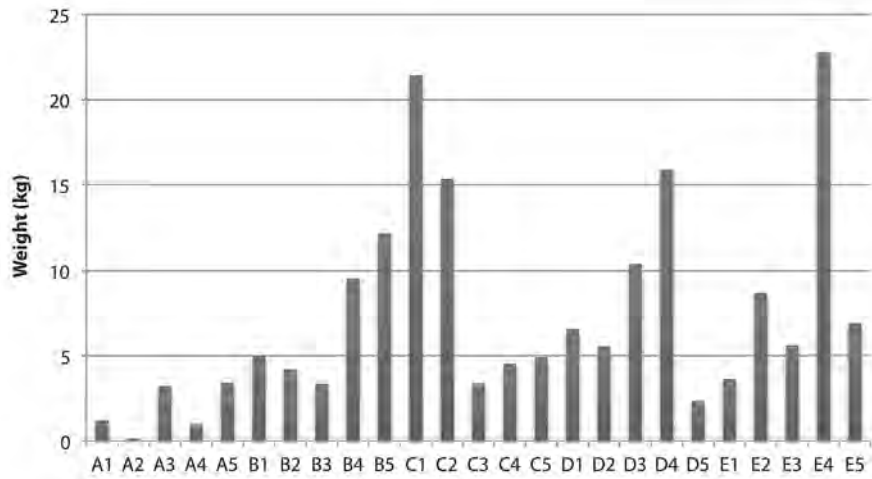


Figure 4.32. Weight (kg) of clay lumps, Trench 2 by square, total = 181.35 kg.

Source: C. Sarjeant.

Clay pellets

The clay pellets were small, rounded, low-fired clay spheres, usually tempered with fine sand (Figure 4.33). Sixty-nine pellets were recovered from An Sơn. In 2009, the majority were excavated from Trenches 1 and 2 (Figure 4.34). Most were between 15 and 20 mm in diameter, with an average of 17.18 mm (Figure 4.35). The pellets were primarily found in layers 1 and 5 in Trench 1, layers 4 and 5 in Trench 2, and layers 1 to 3 in Trench 3 (Figure 4.36). The majority of the pellets in Trench 1 were from square B6 (Figure 4.37) and from the D squares in Trench 2 (50 percent of all the Trench 2 pellets) (Figure 4.38). Similar clay pellets have been recovered from sites all over Southeast Asia and are thought have been propelled by pellet bows or slingshots to catch birds and small game (Higham 2009a: 244). Another possibility is that the pellets were used as toys, like marbles.



Figure 4.33. Clay pellet, Trench 3, layer 1/2, B7.

Source: Photo by C. Sarjeant.

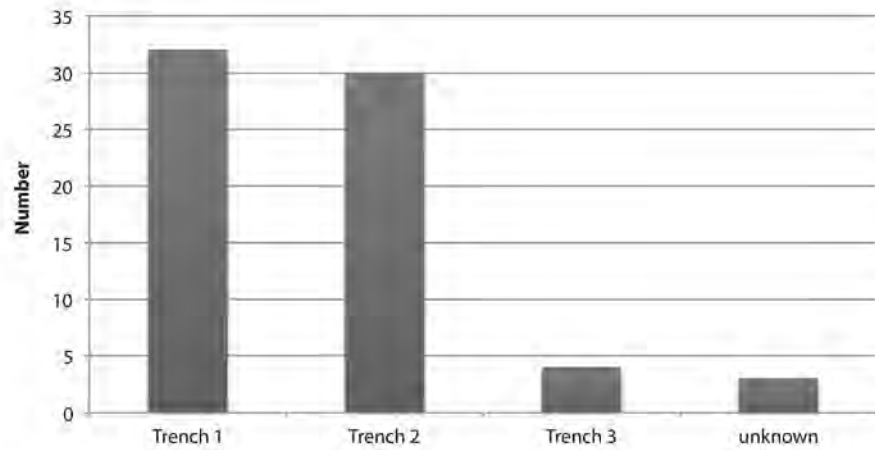


Figure 4.34. Total number of clay pellets in each trench, total = 69.

Source: C. Sarjeant.

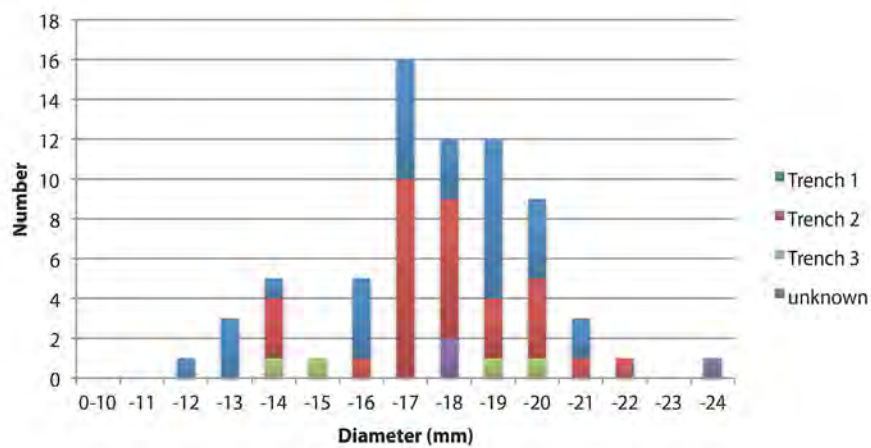


Figure 4.35. Diameter (mm) of clay pellets, total = 69, average = 17.18 mm.

Source: C. Sarjeant.

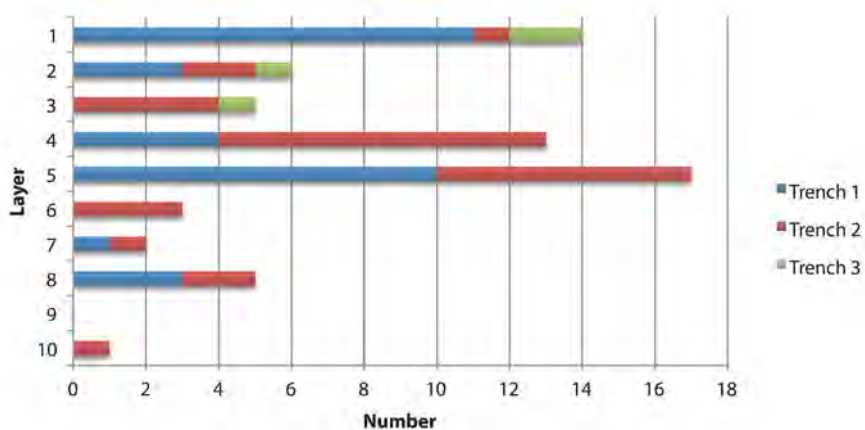


Figure 4.36. Distribution of clay pellets by layer, total = 66.

Source: C. Sarjeant.

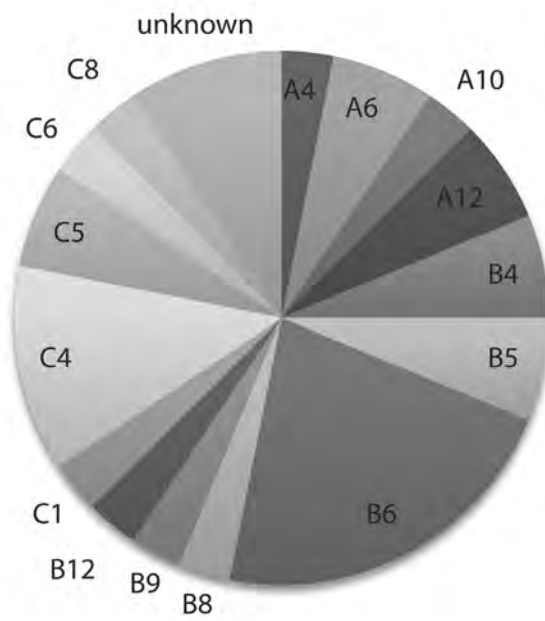


Figure 4.37. Distribution of clay pellets by square, Trench 1, total = 32.

Source: C. Sarjeant.

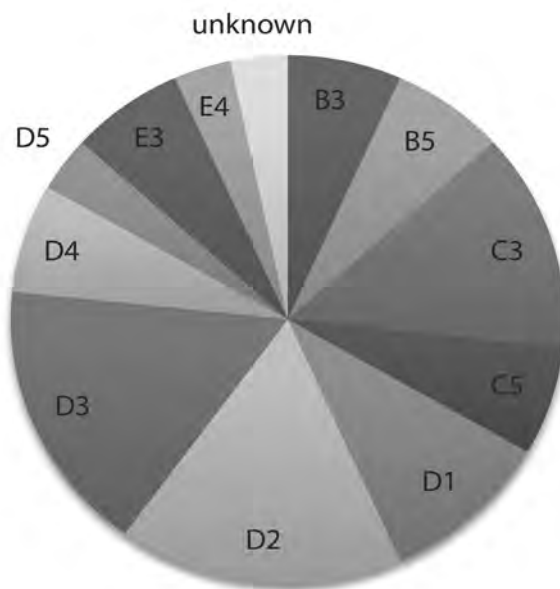


Figure 4.38. Distribution of clay pellets by square, Trench 2, total = 30.

Source: C. Sarjeant.

Ceramic roundels

Ceramic roundels (or perhaps counters) are modified pieces of ceramic sherd. The original pottery vessel surface treatments, such as burnishing, cordmarking and comb incisions are common features of the roundels (Figure 4.39). It appears that sand tempered sherds with surface treatment or decoration were preferred for chipping and grinding sherds into roundels. The use of these items is uncertain (Higham 2009a: 244). The majority were recovered from Trench 1 (Figure 4.40) and were commonly between 35–40 and 45–50 mm in diameter, with an average of 42.4 mm (Figure 4.41). The roundels were mostly about 4–5 mm thick, with an average of 5.17 mm (Figure 4.42, Figure 4.43). The most common occurrences were in layers 4 and 5 of Trench 1, layer 3 of Trench 2, and layer 1 of Trench 3 (Figure 4.44). Thus, roundels were an increasing component of the material culture assemblage at An Sôn in the middle to later phases of occupation. Spatially, they were most frequently identified in A5 and C5 of Trench 1 (Figure 4.45). Only one roundel was perforated (Figure 4.46).

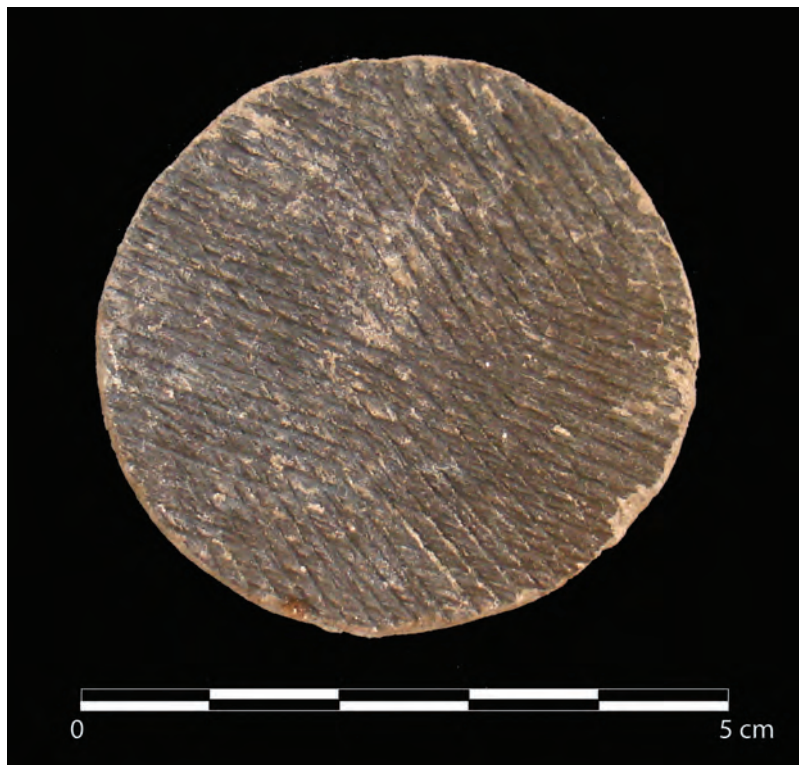


Figure 4.39. Ceramic roundel, Trench 1, layer 5, B5.

Source: Photo, C. Sarjeant.

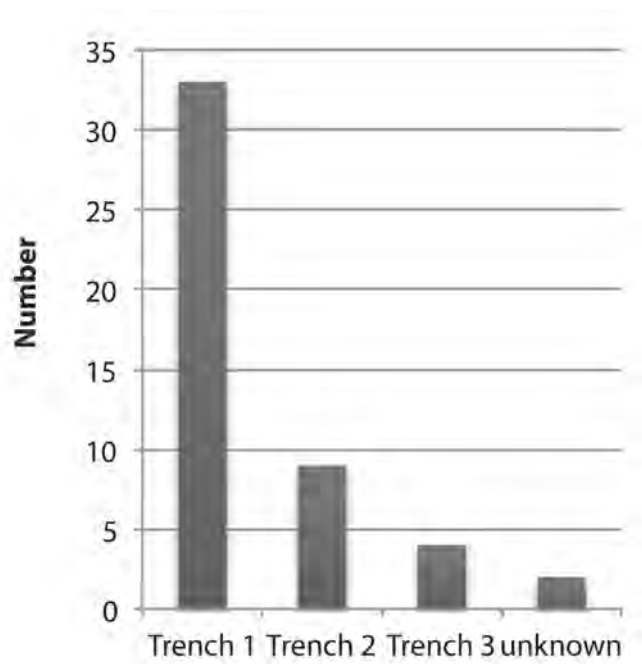


Figure 4.40. Total number of ceramic roundels in each trench, total = 48.

Source: C. Sarjeant.

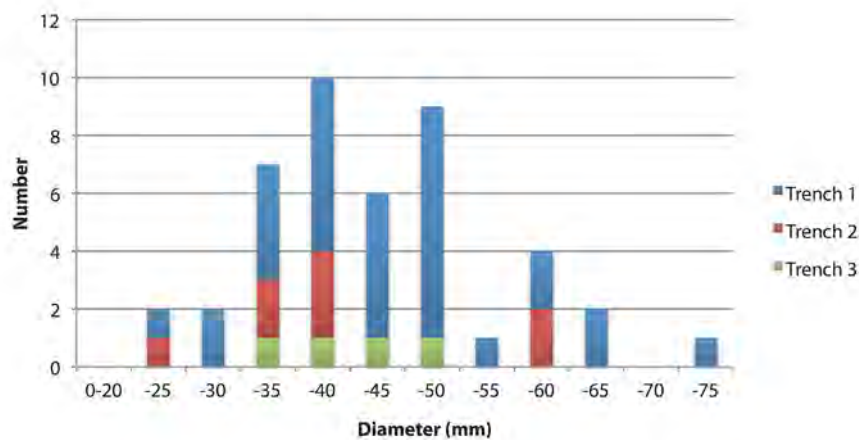


Figure 4.41. Diameter (mm) of ceramic roundels, total = 44, average = 42.4 mm.

Source: C. Sarjeant.

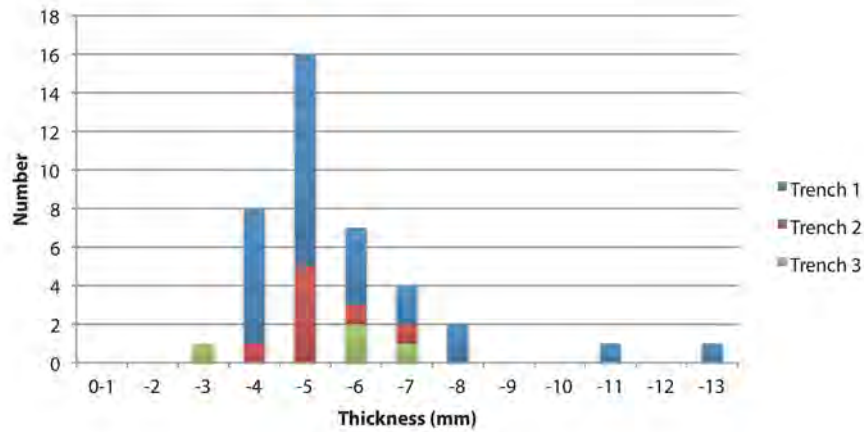


Figure 4.42. Thickness (mm) of ceramic roundels, total = 39, average = 5.17 mm.

Source: C. Sarjeant.

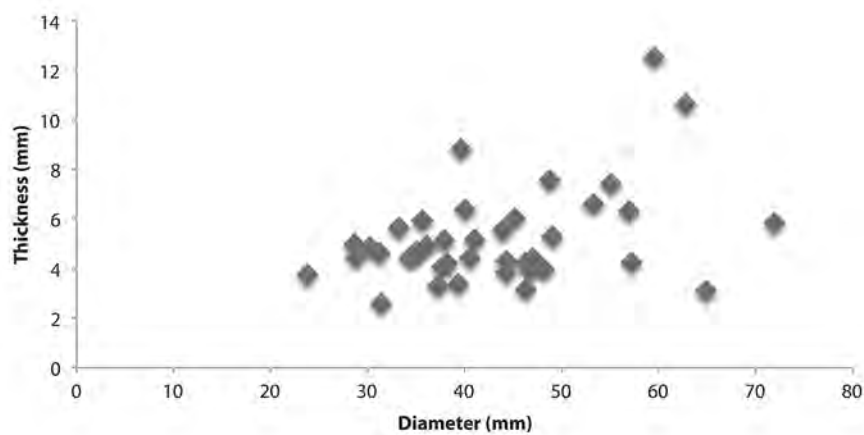


Figure 4.43. Relationship of thickness (mm) versus diameter (mm) of ceramic roundels, total = 41.

Source: C. Sarjeant.

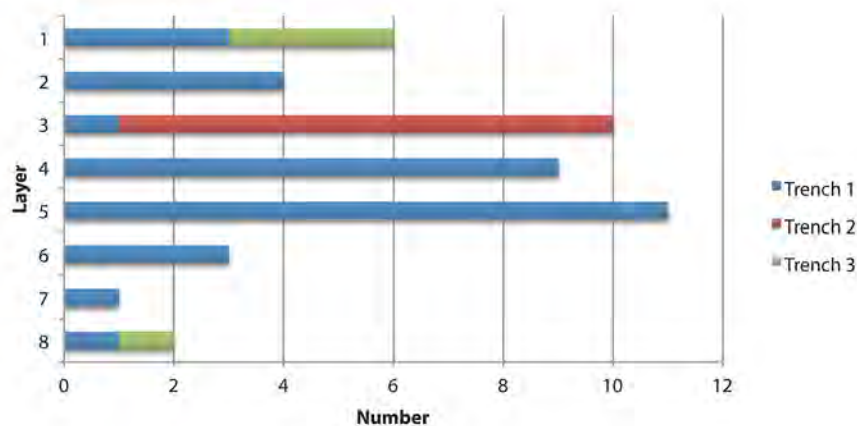


Figure 4.44. Distribution of ceramic roundels by layer, total = 46.

Source: C. Sarjeant.

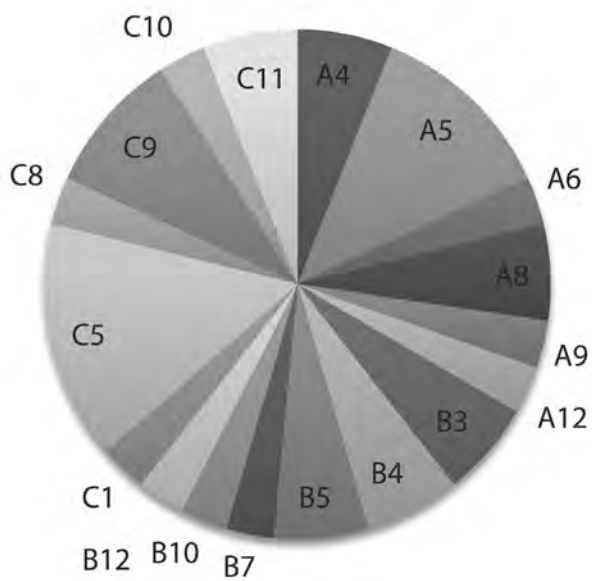


Figure 4.45. Distribution of ceramic roundels by square, Trench 1, total = 33.

Source: C. Sarjeant.



Figure 4.46. Perforated ceramic roundel, Trench 1, layer 6, A3.

Source: Photo, C. Sarjeant.

Lithics

The stone assemblage in the 2009 excavation was primarily restricted to tools, rather than ornaments. One bangle fragment was excavated from Trench 3 (Figure 4.47). The assemblage was dominated by complete but reworked and/or broken rectangular-sectioned adzes, both shouldered and unshouldered (Figure 4.48), and flakes, many of which were polished to indicate reworking of the adzes on site. There was however, a limited presence of cores, unworked raw material, blanks and preforms at the site, suggesting the tools were brought to An Sơn already made, and then reworked and resharpened as needed until the adzes became too small or broke and were non-functional. This explains the presence of whetstones and sandstones at the site, for sharpening and polishing.

The majority of the stone artefacts, $n > 800$, were recovered from Trench 1 while less than 100 were recovered from Trench 2. A total of 1287 stone artefacts were excavated in 2009 (Figure 4.49). Over 600 were flakes that were most likely debitage from reworking adzes. In further support of this claim, over half of these flakes had polished surfaces. In terms of tools, adzes were the most common artefact in the assemblage, although some symmetrically-profiled axes were identified. One unique item included a large unused spearhead (Figure 4.50). Other stone items included whetstones for grinding and sharpening tools and sandstone for polishing. One burnishing stone was also recovered from a burial (Figure 4.51). Most of the adzes were manufactured from hornfels metamorphic rock, basaltic igneous rock or tuff. The whetstones and polishers were made from fine to coarse-grained sandstone, and the burnishing stones were quartz or quartzite. Detailed analysis of the raw materials remains to be undertaken.

There was a higher proportion of unshouldered adzes than shouldered forms (Figure 4.52). Generally, the unshouldered adzes were more frequently observed in the upper layers and the shouldered types were more commonly recovered from the lower layers of the site (Figure 4.53, Figure 4.54, Figure 4.55, Figure 4.56). The sizes of the unshouldered and shouldered adzes were similar, and the unshouldered adzes had the average dimensions of 70.85 mm long, 38.71 mm wide and 18.06 mm thick, while the shouldered adzes had the average dimensions of 76.02 mm long, 49.74 mm wide and 18.52 mm thick (Figure 4.57, Figure 4.58). This is consistent with the shouldered to unshouldered sequence that was reported by Nishimura and Nguyễn (2002: 106) for the 1997 excavation.



Figure 4.47. Stone bangle fragment, Trench 3, layer 1, B8.

Source: Photo, C. Sarjeant.



Figure 4.48. Selected shouldered and unshouldered lithic adzes. Left to right: Trench 1, layer 4–5, B5; Trench 1, layer 8, B12; Trench 1, layer 5, A9.

Source: Photos, C. Sarjeant.

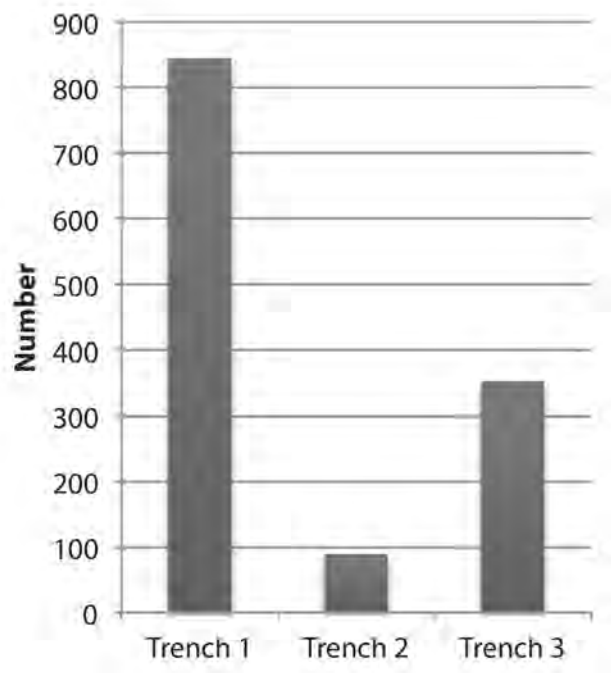


Figure 4.49. Total number of lithic artefacts in each trench, total = 1287.

Source: C. Sarjeant.

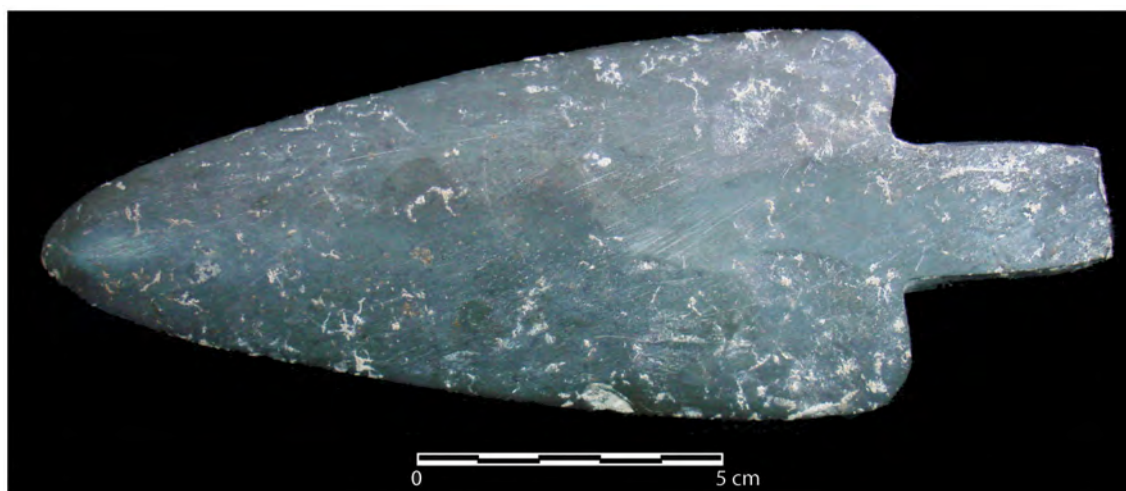


Figure 4.50. Stone spearhead, Trench 2, layer 2–3, E4.

Source: Photo, C. Sarjeant.



Figure 4.51. Burnishing stone, Trench 1, layer 8, A10, burial 2.

Source: Photo, C. Sarjeant.

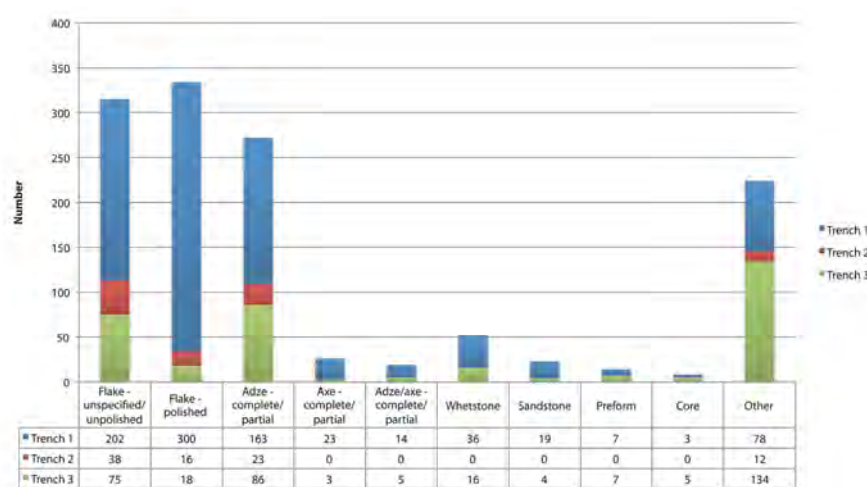


Figure 4.52. Number of lithic artefacts in each trench, total = 1287. 'Other' includes general debitage that were not further analysed, and miscellaneous items.

Source: C. Sarjeant.

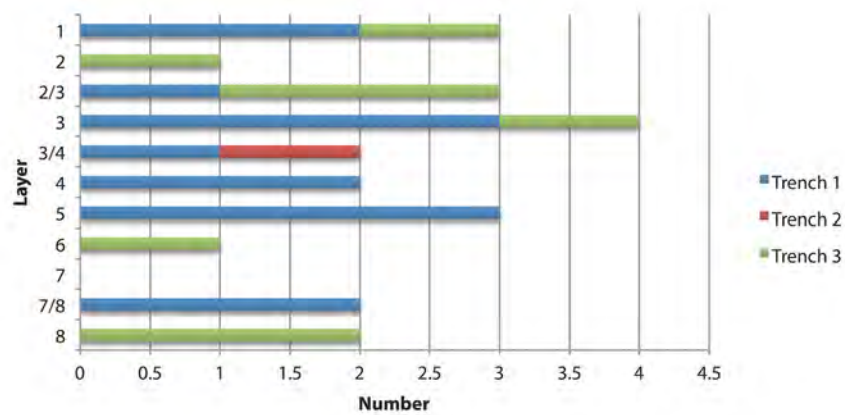


Figure 4.53. Distribution of complete unshouldered adzes by layer, total = 23.

Source: C. Sarjeant.

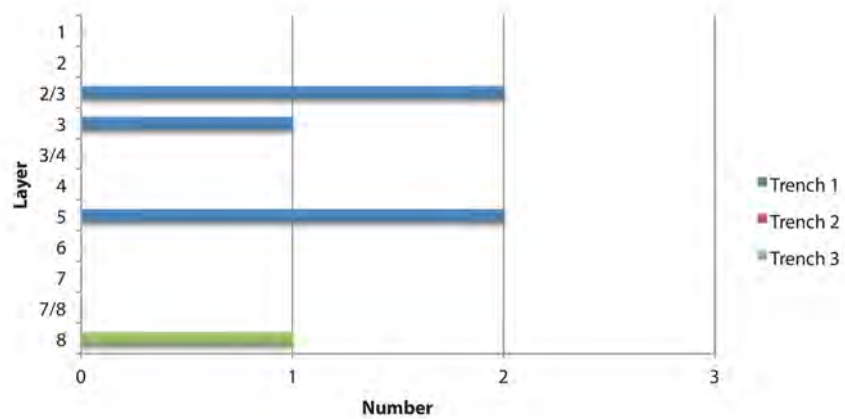


Figure 4.54. Distribution of complete shouldered adzes by layer, total = 6.

Source: C. Sarjeant.

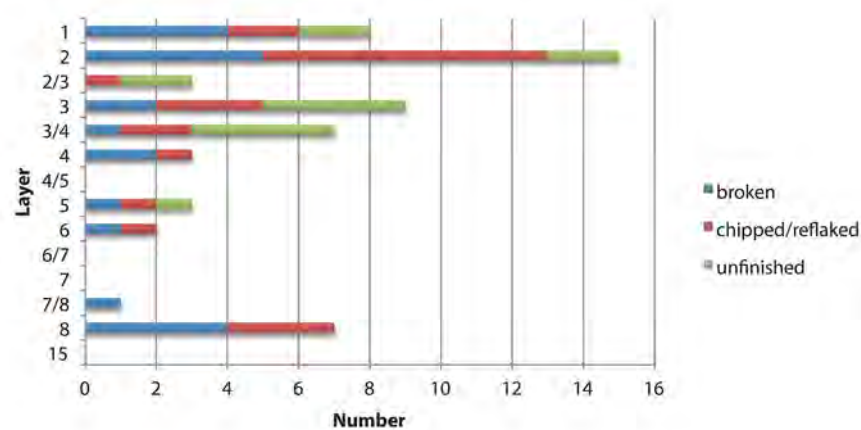


Figure 4.55. Distribution of broken, chipped/reflaked and unfinished unshouldered adzes by layer, total = 58.

Source: C. Sarjeant.

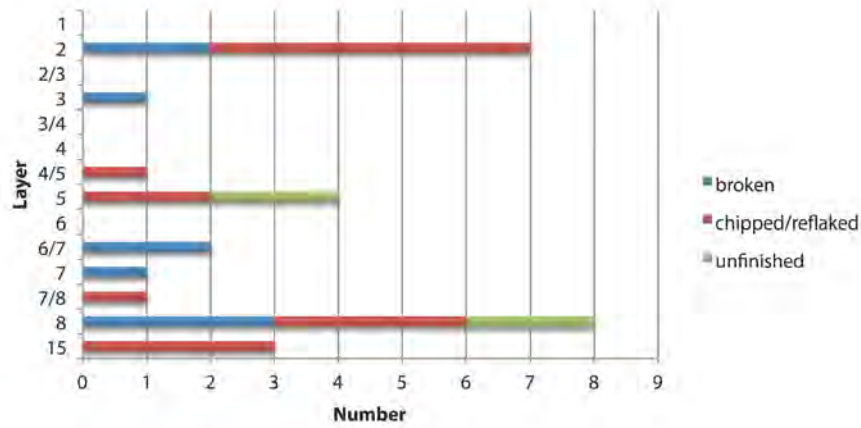


Figure 4.56. Distribution of broken, chipped/reflaked and unfinished shouldered adzes by layer, total = 28.

Source: C. Sarjeant.

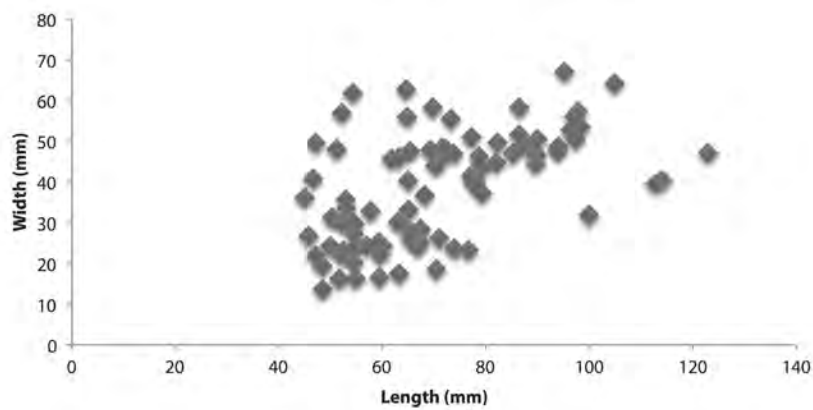


Figure 4.57. Relationship of width (mm) versus length (mm) of unshouldered adzes, total = 86.

Source: C. Sarjeant.

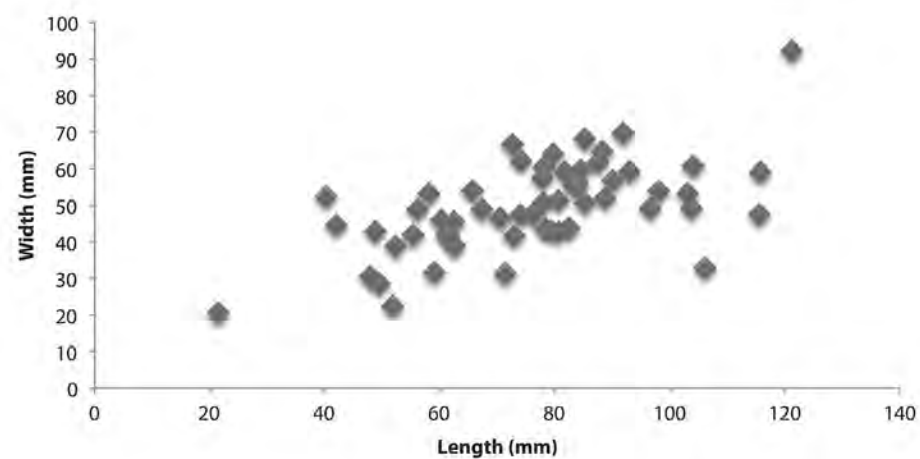


Figure 4.58. Relationship of width (mm) versus length (mm) of shouldered adzes, total = 56.

Source: C. Sarjeant.

Shell artefacts

The most common shell artefacts at An Sôn were beads. The assemblage consisted of 196 beads. These were found only in burial fill and the midden soil of Trench 2, when the soil from this trench was wet sieved through 1.2 mm and 2 mm mesh. The range of shapes was limited to predominantly disc-shaped and rectangular or cylindrical beads, while a few square beads were recovered (Figure 4.59, Figure 4.60). Generally, the beads were small (Figure 4.61). The disc-shaped beads were mostly 3.0 to 4.5 mm in diameter, with an average of 3.18 mm, and their thickness ranging from 0.7 to 1.7 mm. The rectangular/cylindrical beads were mostly 3.5 to 5.0 mm in diameter, with an average of 4.62 mm, and 5.5 to 6.0 mm in length, with an average of 5.65 mm. The thickness ranged from 2.4 to 4.5 mm. The square-shaped beads were on average 3.77 mm wide. The previous An Sôn excavations uncovered more variation in the shell beads, some of which were larger than those in the 2009 collection. A selection of the beads from the 2004 excavation is shown in Figure 4.62.

A bivalve shell was also recovered from burial 3 in Trench 2. It may have been a deliberate mortuary offering, as bivalves have often been found in the burials at Ban Non Wat in northeast Thailand, for example (see Higham and Higham 2009a: 17). The earliest excavation at An Sôn in 1978 also uncovered many bivalve shells with glossy usewear, suggesting they may have been used for reaping in rice fields. Similar gloss was identified on the shells from the occupational layers in the 2009 excavation (Peter Bellwood, pers. comm.).



Figure 4.59. Disc-shaped and rectangular/cylindrical shell beads, Trench 2, layer 5/6, D2.

Source: Photo, C. Sarjeant.

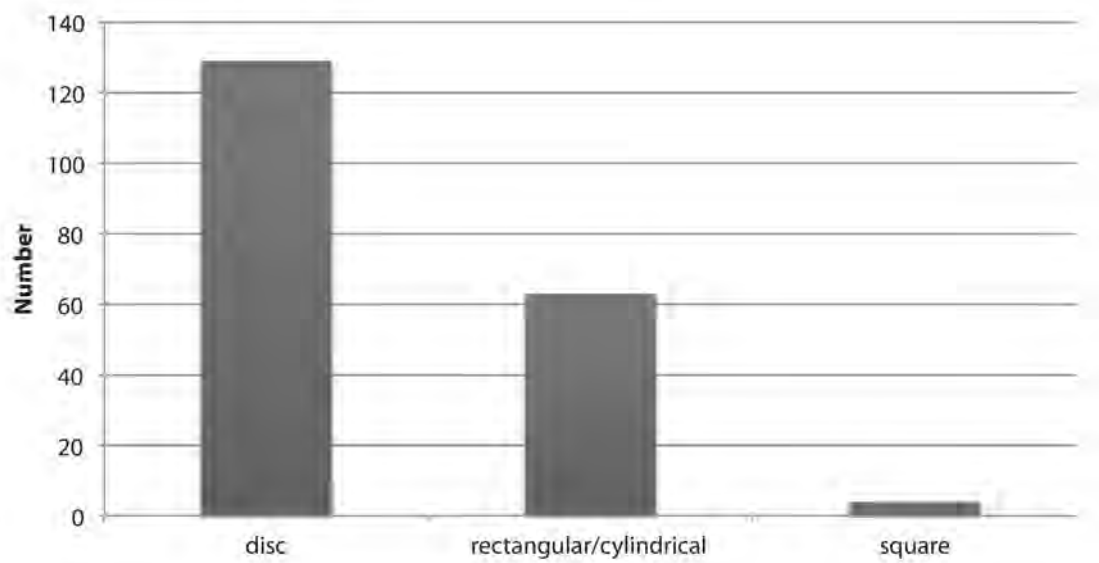


Figure 4.60. Number of shell beads by shape, total = 196.

Source: C. Sarjeant.

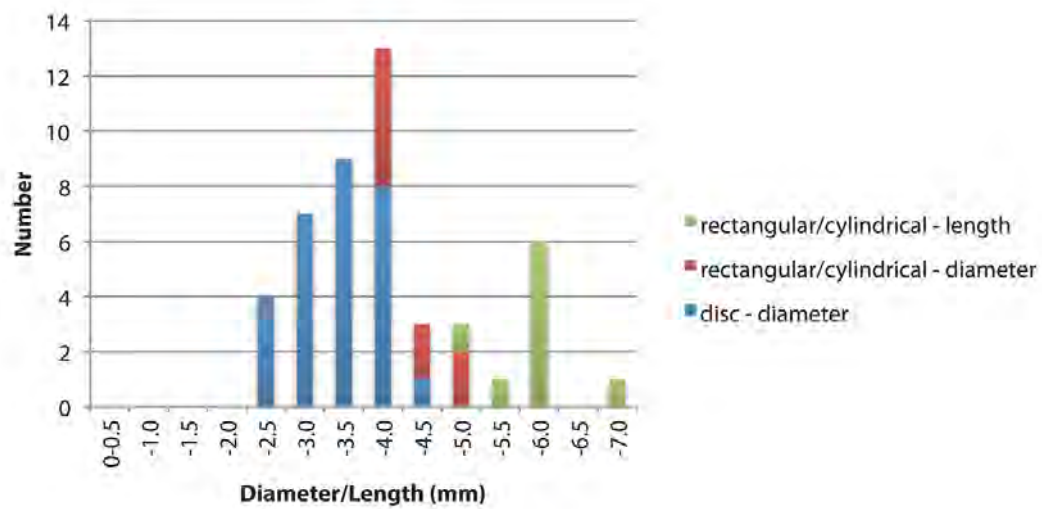


Figure 4.61. Diameter (mm) and length (mm) of rectangular/cylindrical beads and diameter of disc-shaped beads.

Source: C. Sarjeant.

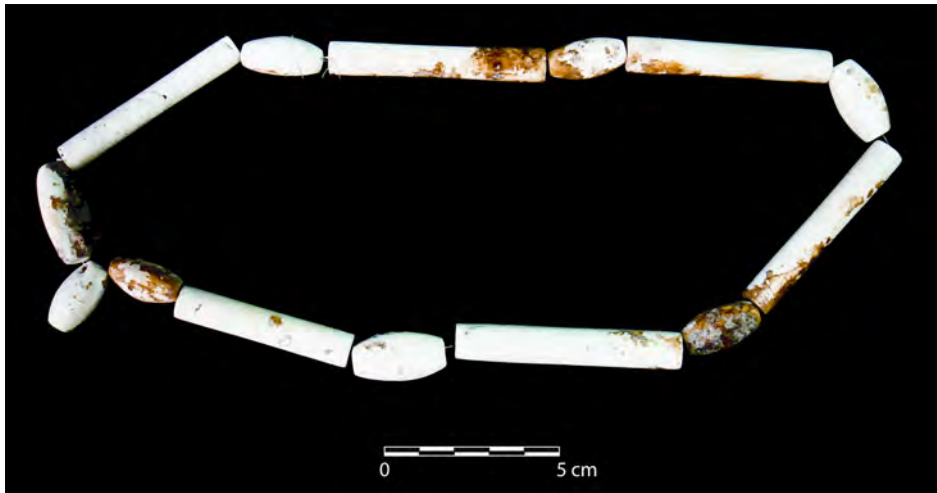


Figure 4.62. Shell bead necklace, 2004 excavation, Trench 3, burial 1.

Source: Photo, C. Sarjeant.

Other artefacts

Other artefacts excavated at An Sơn during the 2009 excavation included bone and ivory items. Only one bone fishhook was recovered (Figure 4.63), but previous excavations have revealed different shapes of fishhooks and preforms (Figure 4.64). The ivory items included bangle fragments or pointed tools (Figure 4.65). Additionally, some unique clay and stone artefacts were recovered, including two possible clay beads. One was round with a perforation and a line was worn around the exterior, and the other was disc-shaped with a perforation (Figure 4.66). There were also some small ceramic cylinders with dense fibre fabric, and petrified rods with fibre impressions and stick-hole impressions. These miscellaneous items were found in Trenches 1 and 2 and it has been suggested they were temper sticks that were then crushed for ceramic manufacture (Nishimura and Nguyễn 2002). A stone implement with a ground circular centre was identified within the vicinity of the midden and cooking area in Trench 2, suggesting another item may have been turned into it to create heat and fire, perhaps for cooking (Figure 4.67).



Figure 4.63. Bone fishhook fragment, Trench 2, layer 15, A2–A5/B2–B5.

Source: Photos, C. Sarjeant.



Figure 4.64. Bone artefacts from 1997 excavation. Left to right: awl, 1997 excavation, Trench 1, layer 3; fishhook preform, 1997 excavation, Trench 1, layer 2; fishhook, 1997 excavation, Trench 1, layer 2; bangle fragment, 1997 excavation, Trench 1, layer 2.

Source: Photos, C. Sarjeant.



Figure 4.65. Ivory bangle fragment (left) and pointed tool (right). Left to right: Trench 2, layer 2–3, D5; Trench 2, layer 1, E4.

Source: Photos, C. Sarjeant.



Figure 4.66. Clay beads. Left to right: Trench 1, layer 5, B3; Trench 1, layer 1, C2.

Source: Photos, C. Sarjeant.

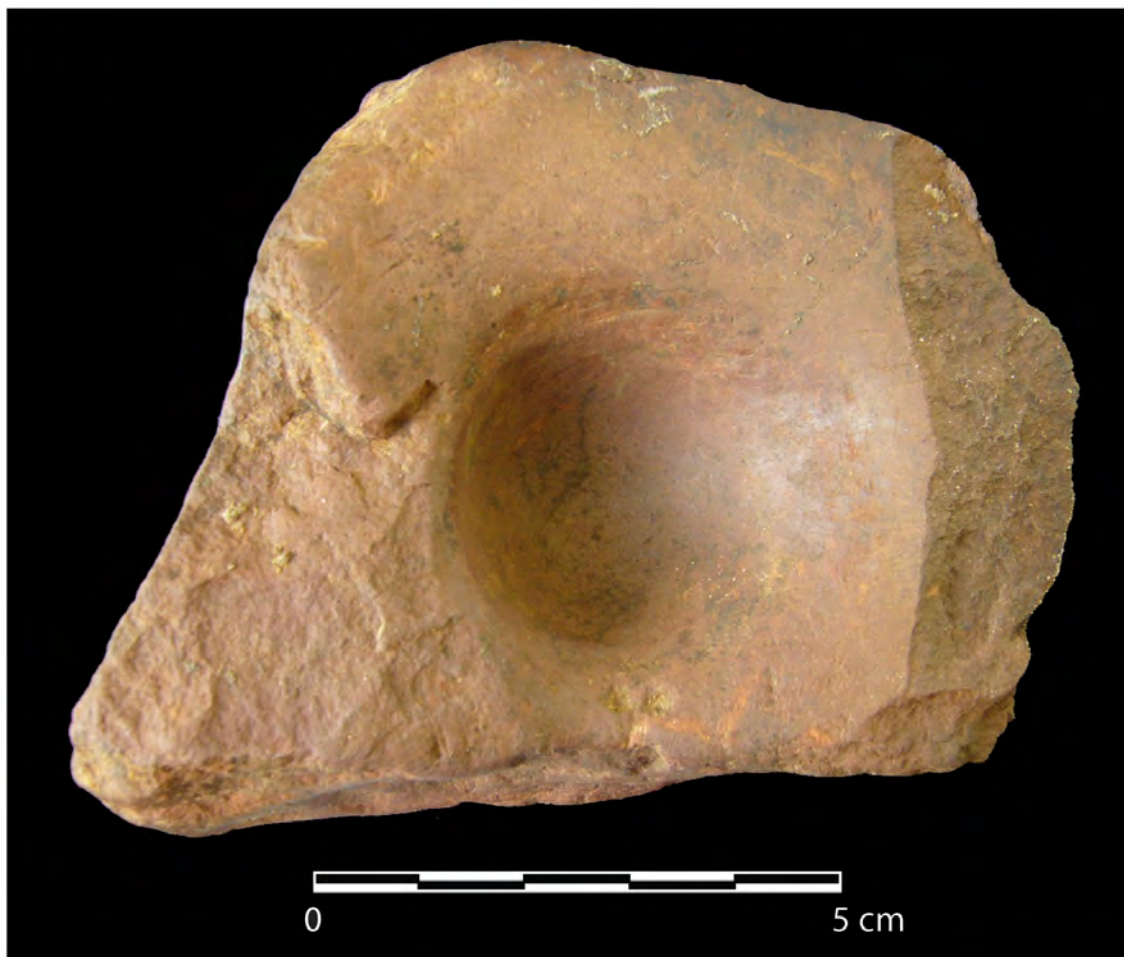


Figure 4.67. Possible stone for lighting fires, Trench 2, layer 3, C5.

Source: Photos, C. Sarjeant.

Burials

The material culture found amongst the 2009 An Sơn burials was quite limited. Complete ceramic vessels were the most common mortuary offering, while additional items included shell beads, stone adzes, and ceramic sherd sheets covering the body (Figure 4.68, Figure 4.69, Figure 4.70, Figure 4.71, Figure 4.72, Figure 4.73, Table 4.5). Infants were very rarely interred with grave goods apart from a single ceramic vessel. The ceramic vessels in the burials are discussed further in Chapter 5. Offerings were more likely to be present in the burials for individuals who were over the age of 10, or adolescents. Two male interments included a higher number of ceramic vessels, although one female individual was interred with the greatest number, nine ceramic vessels. The buried individuals and the mortuary analysis for An Sơn have been studied by Anna Willis, PhD candidate, The Australian National University.



Figure 4.68. Trench 1, burial 1.

Source: Burial photo, A. Willis.

Table 4.5. Identification and mortuary offerings of burials from all excavation seasons at An Son.

Excavation year	Burial	Sex	Age range	Orientation	Complete pots	Stone adze	Stone tool	Stone	Shell	Clay pellet	Shell beads	Bangle fragment	Burnishing stone	Turtle carapace	Dog mandible	Ceramic sherd sheet
2004	Trench 1 M1a	Subadult	1–4	North-East/ South-West	0											
	Trench 2 M1a	Subadult	<1	South-West/ North-East	0											
	Trench 3 M1a	Male	30+	North-East/ South-West	8	1					1000					
	Trench 3 M2a	Female	Indeterminate		0									1		
	Trench 3 M3a	Male	30+	North-East/ South-West	0	1									1	
	Trench 3 M4a	Subadult	10–14	North-South	1											
	Trench 3 M5a	Female	30+	North-East/ South-West	1										1	
	Trench 3 M6a	Subadult	5–9	East-West	0										1?	
	Trench 3 M7a	Female	Indeterminate	North-East/ South-West	3											
	Trench 3 M8a	Male	15–29	North-East/ South-West	1							1			1	
	Trench 3 M10a	Indeterminate	15–29	North-West/ South-East	3											
	Trench 3 M13a	Male	30+	North-South	5	1									1	
	Trench 3 M14a	Indeterminate	15–29	North-East/ South-West	1											
	Trench 3 M16a	Subadult	1–4	North-East/ South-West	0										1?	
2007	Trench 3 M17a	Female	15–29	North-East/ South-West	2											
	Trench 1 M1a	Subadult	1–4	North-South	0											
	Trench 1 M2a	Subadult	1–4	North-South	0											
	Trench 1 M3a	Female	15–29	North-East/ South-West	1					1	7					1?
	Trench 1 M3b	Subadult	<1		0											
	Trench 1 M4a	Subadult	1–4		0											

Excavation year	Burial	Sex	Age range	Orientation	Complete pots	Stone adze	Stone tool	Stone	Shell	Clay pellet	Shell beads	Bangle fragment	Burnishing stone	Turtle carapace	Dog mandible	Ceramic sherd sheet
	Trench 1 M1a	Female	30+		0										1?	1
	Trench 1 M2a	Female	15–29	North-East/ South-West	9	2?			1?				1?			
	Trench 1 M3a	Male	30+	North-East/ South-West	2	1?										1
2009	Trench 1 M4a	Subadult	1–4	North-East/ South-West	1											1
	Trench 2 M1a	Subadult	<1	South-East- North-West	0											
	Trench 2 M2a	Subadult	<1	North-East/ South-West	1						2					
	Trench 2 M3a	Subadult	10–14	North-East/ South-West	3	1	1?	2	2		13					

Source: Compiled by A. Willis.



Figure 4.69. Trench 1, burial 2.

Source: Burial photos, A. Willis; artefact photos, C. Sarjeant.

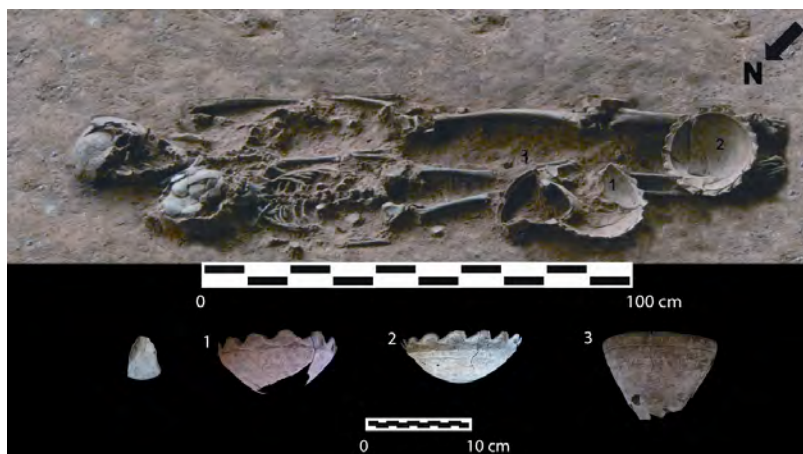


Figure 4.70. Trench 1, burials 3 and 4.

Source: Burial photos, A. Willis; artefact photos, C. Sarjeant.



Figure 4.71. Trench 2, burial 1.

Source: Burial photo, A. Willis.



Figure 4.72. Trench 2, burial 2.

Source: Burial photos, A. Willis; artefact photos, C. Sarjeant.



Figure 4.73. Trench 2, burial 3.

Source: Burial photos, A. Willis; artefact photos, C. Sarjeant.

Flora

Melissa Tan of University College London has analysed phytolith samples from lower deposits in Trenches 2 and 3 and the Test Square at An Sôn. The preliminary findings indicate a presence of diatoms and sponge spicules, which suggest a high frequency of riverine flooding, and silica aggregate which suggests a burnt environment. The burning probably took place mainly as the site was initially settled, since the basal deposits of the Test Square at 2.25 and 2.95 m depth had the most evidence for this (P. Bellwood, pers. comm.). Associate Professor Tetsuro Udatsu of Miyazaki University in Kyushu, Japan also conducted a phytolith analysis and identified *Oryza* in Trench 2 and at a depth of 2.3 m in the Test Square. Tan's results, with the additional analysis by Udatsu, identified other plant remains including grasses, *Cyperaceae* (sedges), *Palmae* (palms), *Panicoideae* (grass), *Chloridoideae* (grass), *Phragmites* (wetland grass), *Andropogonea* (grass), *Commelinaceae* (flowering plants), *Bambusoideae* (bamboo), millet-type grasses, and probably *Oryza* (rice) (P. Bellwood, pers. comm.). The complete archaeobotanical reports for An Sôn are yet to be published.

While it is possible that the fibre temper identified in the ceramics at An Sôn may have included grasses of some kind, the presence of the double peaked glumes in most sherds observed in SEM backscatter images specifically suggest that *Oryza* rice husk was used as temper (see Chapter 6, Part I). Katsunori Tanaka of the Research Institute of Humanity and Nature, Japan identified *Oryza sativa japonica* as temper inclusions in a ceramic sherd. The term 'fibre temper' is used in this monograph to accommodate a variety of organic inclusions, including rice husks, in the ceramics at An Sôn (explained further in Chapter 6, Part I).

Fauna

The fauna from An Sơn has been analysed by Philip Piper and colleagues (Piper *et al.* 2012). The excavation of Trench 2 involved wet sieving midden samples through a 2 mm mesh, and this resulted in the recovery of large and small vertebrates and very small fish bones. Pig and dog were the most frequent mammals, and the earliest evidence of dog was at a depth of 190–200 cm in the Test Square, corresponding to just after the initial occupation of the site. Most, if not all, of the canid remains belonged to domestic dogs (*Canis*), rather than the only native Southeast Asian canids, the golden jackal (*Canis aureus*) or the Asiatic wild dog (*Cuon alpinus*). Cut marks were identified on the dog bones and the evidence suggests the dogs were penned, butchered and eaten (Piper *et al.* 2012).

The oldest pig remains were identified at a depth of 230–240 cm in the Test Square, the earliest phase of occupation. None of the excavated remains exceeded two years old at death. Although there may be other reasons for such a young kill-off population, domestic animal management is a likely scenario at An Sơn. While the dentition of the suids at An Sơn is similar in size to that of modern Eurasian wild pigs (*Sus scrofa*), this does not eliminate the possibility of domestication since managed pig populations show no size reduction in dental remains in relation to known domestication events in the northern Philippines, where pigs are known to have been introduced (Piper *et al.* 2012; Piper *et al.* 2009).

Other mammalian remains included either the Asian house rat (*Rattus tanezumi*) or rice field rat (*Rattus argentiventer*). The most common wild animals were pond, box and water turtles (Geomydidae). In addition, Deer (*Rusa unicolor*, *Cervus eldi*), monitor lizard (*Varanus* sp.), mouse deer (*Tragulus napu*), crocodile (*Crocodylus*), and monkey (Cercopithecidae) were all identified. These wild animals were a small component and probably did not provide a major contribution to the diet (Piper *et al.* 2012). The most abundant archaeozoological remains were of fish, including snakehead (Channidae), swamp eel (Synbranchidae) and climbing perch (*Anabus testudineus*), river catfish (Clariidae), Barramundi (Centropomidae), tire track eels (Mastacembelidae), and glassy perchlets (Chandidae) (Piper *et al.* 2012).

Summary

This chapter has aimed to provide an overview of the 2009 excavation at An Sơn, in order to present a context for further discussion of the ceramic assemblage. The stratigraphy and material contents of each of the excavated trenches in the 2009 excavation revealed variable contexts, suggesting different areas of the site had different functions in the past. An Sơn has been dated from 2009 excavation material at 2500–2200 cal. BC to 1500–1200 cal. BC.

Trench 1 in the 2009 excavation yielded the majority of the ceramic material culture, including the highest quantity of ceramic sherds. The greatest density of these sherds was identified in the middle layers. An equal amount of clay pellets were excavated from Trenches 1 and 2, while ceramic roundels were more frequently identified in Trench 1 in the middle to later phases of occupation. Most of the lithic artefacts were polished flakes, identified as debitage from reworking adzes, and were predominantly found in Trench 1. Unshouldered lithic adzes were more common than shouldered adzes, and unshouldered adzes were characteristic of the upper layers, while shouldered adzes were more often in the lower layers.

Shell artefacts at An Sơn were most commonly identified as small beads, although a greater range of sizes and shapes of beads were excavated in 2004. Bone and ivory items were also recovered. Although only one bone fishhook was found in 2009, others have been identified in earlier excavations.

Mortuary offerings were usually only interred with individuals over the age of 10 or adolescence, with few infants interred with grave goods. The floral evidence suggested An Sơn had been burnt for occupation, and the presence of *Oryza sativa japonica*, rice, has been confirmed at the site. In terms of faunal evidence, pig and dog were the most frequently identified mammals, and the presence of domesticates has important implications for characterising neolithic occupation at the time of settlement at An Sơn.

The aspects of neolithic occupation presented in this chapter—the stratigraphy, chronology, material culture, burials, flora and fauna—are re-introduced in the discussion of the socio-technical organisation of ceramic manufacture and the neolithic settlement at An Sơn (Chapters 10 and 11).

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