The Second Season of Excavations at Tepe Rahmat Abad, Southern Iran: The Absolute and Relative Chronology

Hossein Azizi Kharanaghi, Hassan Fazeli Nashli, Yoshihiro Nishiaki

Abstract

Fars province has full potential for those wishing to study the long term cultural developments from the Neolithic to the Chalcolithic in the land of Iran. Recent extensive excavations and surveys in the region have provided key information as to when such cultural transformation occurred, although much of the detail remains to be further elucidated. The second season of archaeological excavation at Rahmat Abad was carried out in 2009 with the main objective of refining the absolute and relative chronological sequence of the Neolithic and Chalcolithic occupations. As a result, Tepe Rahmat Abad yielded the first evidence for Pre-Pottery Neolithic occupations in the Fars province and therefore provided critical new insights into the spread of the Neolithic across the southern Zagros. In addition, the excavations revealed a long cultural sequence within the 9 m-deep cultural deposits, ranging from 1) the Islamic Qajar period (nineteenth century AD), 2) Achaemenian (fifth century BC), 3) Early-Middle Bakun (early to mid-fifth millennium BC), and 4) Pottery Neolithic (late seventh millennium BC) to 5) Pre-Pottery Neolithic (late eighth to early seventh millennium BC).*

Introduction

Tepe Rahmat Abad (E 053° 3'27.89", N 30° 6'43.50"; 1774 m asl) is located next to the village of the same name. It covers an area of just 0.5 ha and rises 5 m above the surrounding plain (Fig. 1). The mound sits at the edge of the fertile Kamin plain (Sadat Shahr) at the southerly end of the Bolaghi gorge. The Pulvar River runs 500 m to the east, and its bed cuts through the Bolaghi gorge, at the upper end of which lies Pasargadae, the royal capital of the founder of the Persian Empire, Cyrus the Great. The modern Esfahan-Shiraz highway runs to the south of the mound and major parts of the southern and western parts of the mound have been destroyed by road construction activities. Rural houses have encroached on the north and northeastern parts of the mound (Figs 2, 3).*

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1 Azizi Kharanaghi 2009.
Fig. 1. Location of Tepe Rahmat Abad

Fig. 2. Tepe Rahmat Abad topographical map, showing the location of trenches
The first season of excavation at Rahmat Abad was carried out in the summer of 2005, at the same time as the Sivand Dam salvage excavation project. A joint team from the Institute of Archaeology, University of Tehran (Hassan Fazeli Nashli) and Binghamton University, New York (Susan Pollock and Reinhard Bernbeck) conducted the excavation. In the first season three $10 \times 10$ m trenches (A, B and C) were opened in the southern part of the mound, close to the Esfahan-Shiraz highway. Three smaller $2 \times 2$ m trenches were also opened in the south (D), west (E) and north (F) of the mound, with the aim of clarifying the stratigraphy of the site (Fig. 2). In Trenches A, B and C, rich cultural layers primarily dating to the Middle Bakun sub-phase (contemporary with Tall-e Gap) were discovered. The $1 \times 1$ m test pit in the northeastern corner of these trenches revealed some evidence of pre-pottery occupations. In Trenches D and F, only Middle Bakun material was found and in Trench E historic (Achaemenian) and Middle Bakun layers were uncovered.

Despite the large-scale excavations, the first season unfortunately did not reveal a coherent stratigraphic sequence for the site. Therefore, the main objective of the second season at Tepe Rahmat Abad was to establish the site’s relative and absolute chronology. It is also important to note that radiocarbon dates from the first season attested the Pre-Pottery Neolithic of the site, which encouraged us to excavate the site in two seasons. The second phase of excavation successfully yielded new results related to the Neolithic and Chalcolithic periods, making it possible to update the chronology of the Fars region. The important results were obtained from a new trench; that is, Trench G, opened at the highest point of the mound (Fig. 4). This trench yielded the longest sequence of the site within the 9 m of cultural deposits, from the Late Islamic period to the Pre-Pottery Neolithic phase.

Methodology

The excavation was carried out using a single-context recording system and a Harris Matrix was constructed to determine the relationships between the different contexts (Fig. 5). The texture, size, thickness and dimensions of each context were recorded. In Trench G, 43 contexts were documented, numbering 7000 to 7042. A registry number (RN) system was also used to precisely record cultural data. In order to establish the exact location of any given find, the northeast corner of the trench was selected as a fixed point, and each find’s horizontal position (X and Y) was measured from that point. The depth (Z) was recorded using a Dumpy level. Trench G was oriented east-west and located on the eastern slope close to the top of the mound. In order to obtain the maximum information with the minimum damage, this trench was excavated as a step trench (Figs 4, 6). Once each cultural period had been identified, excavation proceeded to a lower

Fig. 5. The Trench G Harris Matrix and relative and absolute chronology
step. In all, 8 m of the trench’s 10 m length was excavated in this way. The remaining 2 × 5 m area was stratigraphically excavated downwards with the aim of understanding the earlier cultural layers. Overall, a total of 8.7 m of deposits were excavated on virgin soil, in which four cultural periods and 43 different contexts were identified (Table 1). Context numbers 7000 to 7009 date to the late Islamic period (Qajar graveyard); contexts 7010 to 7018 to the Achaemenid period (a mud brick structure); contexts 7019 to 7028 to the Bakun period; and contexts 7029 to 7040 to the Neolithic. The Neolithic period can be further divided into two different phases: Pottery Neolithic (contexts 7029 to 7031) and Pre-Pottery Neolithic (contexts 7032 to 7040). The last two contexts (7041 and 7042) represent virgin soil. The virgin soil was comprised of a mixture of large and small stones and it appears that the settlement at Tepe Rahmat Abad was first established on bedrock approximately 4 m below the present level of the plain.
### Context

<table>
<thead>
<tr>
<th>Context No.</th>
<th>Description of Context</th>
<th>Period</th>
<th>Relative chronology</th>
<th>Absolute Dating</th>
<th>Cultural Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>7000</td>
<td>Surface layer, 20 cm thick</td>
<td></td>
<td>Late Islamic</td>
<td>Nineteenth century AD</td>
<td>Qajar</td>
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<tr>
<td>7001</td>
<td>Compact clay layer, 50 cm thick</td>
<td></td>
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<tr>
<td>7003</td>
<td>Cumulative of the rubble, South wall of trench</td>
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<td>545–367 BC</td>
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</tr>
<tr>
<td>7004</td>
<td>Cumulative of the rubble, NW wall of trench</td>
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<td>4909–4688 BC</td>
<td>Gap Phase</td>
<td></td>
</tr>
<tr>
<td>7005</td>
<td>A big stone, NW wall of trench</td>
<td>Bakun</td>
<td>4909–4688 BC</td>
<td>Gap Phase</td>
<td></td>
</tr>
<tr>
<td>7006</td>
<td>Paving of burial</td>
<td></td>
<td></td>
<td></td>
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<td>7007</td>
<td>Burial</td>
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<td></td>
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<td>Qajar</td>
</tr>
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<td>7010</td>
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<tr>
<td>7011</td>
<td>Clay layer, 60 cm thick</td>
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</tr>
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<td>Mud-brick wall</td>
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<td>7013</td>
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<td>Clay layer, 20 cm thick</td>
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</tr>
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<td>7021</td>
<td>Small oven</td>
<td>Bakun</td>
<td>6218–6028 BC</td>
<td>Mushki Phase</td>
<td></td>
</tr>
<tr>
<td>7022</td>
<td>Small stones</td>
<td>Bakun</td>
<td>6218–6028 BC</td>
<td>Mushki Phase</td>
<td></td>
</tr>
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<td>7023</td>
<td>Ash layer, 16 cm thick</td>
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<td>6218–6028 BC</td>
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<td>7024</td>
<td>Mud-brick structure</td>
<td>Bakun</td>
<td>6218–6028 BC</td>
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<td>7025</td>
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<td>6218–6028 BC</td>
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<tr>
<td>7026</td>
<td>Compact ash layer, 30 cm thick</td>
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<td>6218–6028 BC</td>
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<tr>
<td>7027</td>
<td>Ash layer, 10 cm thick</td>
<td>Bakun</td>
<td>6218–6028 BC</td>
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<td>7028</td>
<td>Clay layer, 65 cm thick</td>
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<td>Bakun</td>
<td>6218–6028 BC</td>
<td>Mushki Phase</td>
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</table>
Islamic Period: Qajar Graveyard

The excavation indicated that there was a late-Islamic graveyard on top of Tepe Rahmat Abad. Our surveys and field visits to other prehistoric mounds within the region revealed that during the late-Islamic period, especially the Qajar era, the surfaces of such sites were favoured for human burials, probably because of their high elevation. In Trench G, three burials belonging to the Qajar era were identified (Fig. 7). They were simple pits without any structures, oriented towards Mecca and covered with rocks and large pieces of pottery. A larger rock was placed at each end of the grave to mark its location. One of the graves was fully excavated and there was one male skeleton lying on his right side with stone beds in front of the pelvis (Fig. 8). The Qajar graves also badly damaged the Achaemenian contexts of the site.

Achaemenian Period

Underneath the Islamic graves, part of a massive mud brick structure/platform was identified (Figs 9, 10). The limited ceramic data from this phase indicates that it was established during the Achaemenian period. The Achaemenian layers were more than 3 m in thickness (contexts 7015 to 7018). The later part of this phase yielded a radiocarbon date for a charcoal sample, TKA-15307, found in context 7015 (the context between the two circular structures): 545–367 cal. BC (2415 ± 35 uncal. BP) with 89.6% accuracy (Figs 11, 12; Table 4). Owing to the limitation of excavation it is difficult to determine the function of the building; however, it is important to note its location at the entrance of Darre-ye Bolagh, in counterpoint to Pasargadae, the capital of Cyrus the Great. A total of nine contexts (numbers 7010 to 7018) were identified as belonging

Table 1. The cultural sequence of Trench G. Summary of context descriptions and the relative and absolute chronology.

<table>
<thead>
<tr>
<th>Context No.</th>
<th>Description of Context</th>
<th>Period</th>
<th>Relative chronology</th>
<th>Absolute Dating</th>
<th>Cultural Phase</th>
</tr>
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<td>7032</td>
<td>Clay layer, 35 cm thick</td>
<td>Pre-Pottery Neolithic</td>
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<td>7033</td>
<td>Ash layer, 35 cm thick</td>
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<td>Late eighth millennium BC</td>
<td>7047–6744 BC</td>
<td></td>
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<tr>
<td>7034</td>
<td>Ash layer, 6 cm thick</td>
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<td>7035</td>
<td>Burnt clay layer, 8 cm thick</td>
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<td>7036</td>
<td>Burnt clay layer, 5 cm thick</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>7037</td>
<td>Burnt clay layer, soft and white colour</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7038</td>
<td>Black ash layer, 8 cm thick</td>
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<td>7039</td>
<td>Ash layer, 7 cm thick</td>
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</tr>
<tr>
<td>7040</td>
<td>Clay layer, 64 cm thick</td>
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<tr>
<td>7041</td>
<td>Hard clay layer, 27 cm thick</td>
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<tr>
<td>7042</td>
<td>Hard layer of river rocks and soil with lime deposits</td>
<td>Virgin Soil</td>
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</table>
Fig. 7. Qajar burials

Fig. 8. One of the Islamic skeletons
Fig. 9. Achaemenian curvilinear mud brick structures (Trench G)

Fig. 10. Achaemenian mud brick structure of Trench G
Fig. 11. New radiocarbon dates from second seasons of Tepe Rahmat Abad excavation

Fig. 12. Calibrated radiocarbon dates for Trench G
to the Achaemenian period, including compact soil layers and a mud brick structure (Table 1). The surface consisted of seven rows of mud bricks, each with the dimensions of $40 \times 40 \times 10$ cm. Based on the direction of the mud bricks, the structure must have extended towards the outer part of the trench. In order to preserve the mud bricks, we made a step, 2 m in width, and continued digging on the lower step. In this step another mud brick structure was discovered, 2 m below the surface and 0.7 m below the first. It consisted of two curvilinear structures with 15 rows of mud bricks (Figs 9, 10). These two structures were symmetrically located in the northern and southern parts of Trench G (contexts 7014 and 7016). Two types of mud bricks were identified. Most were $40 \times 40 \times 10$ cm but the mud bricks used at the edges of the structures were $40 \times 20 \times 10$ cm.

Plenty of prehistoric pottery sherds were recovered among the mud bricks. This was perhaps due to the levelling of the prehistoric site's surface to make way for the new Achaemenid structure, which damaged the upper Bakun layers. It is quite likely that Rahmat Abad functioned as a strategic location at the entrance to the Bolaghi valley, allowing control or supervision of the king’s road between Pasargadae and Persepolis, used by its new Achaemenid occupants. Many Achaemenian sites were also discovered in Darre-ye Bolaghi,\(^5\) attesting to the importance of this route. The limited extent of the excavation and the huge size of the mud brick structures preclude us to ascertain the specific function(s) of those rooms. Identification was further hindered by the disturbance caused by the later Islamic graves. The wheel-made Achaemenian pottery included simple red ware, well fired and in good condition (Fig. 13).

\(^5\) Attayi 2005; Attayi and Boucherlat 2006.
Bakun Period

In the Fars region, the Chalcolithic period started around the late sixth to the early fifth millennium BC. "Bakun society" represents the Chalcolithic period of the highland culture of Fars, which maintained close relations with societies in lowland southwestern Iran. The Bakun period consists of three phases, each represented by different sites; that is, Bakun B (early), Tall-e Gap (middle) and Bakun A (late), and each phase is distinguished by characteristic ceramic styles. The economy was mainly based on agro-pastoral life, supplemented by hunting. The settlements were generally small (< 1 ha) but a few of them were as large as 6 to 7 or 8 ha, indicating a two-tiered site hierarchy. Excavations thus far conducted at the Bakun sites have not yielded any evidence of the presence of religious centres but attest to craft production, long distance trade, and the earliest examples of administration and sophisticated pastoralist life in the Fars highlands.

The first season of excavation at Rahmat Abad exposed ceramic workshops dating back to the first half of the fifth millennium BC. The workshops are contemporary with those known at Tepe Pardis, dating from 4909–4688 cal. BC. The discovery of round kilns and their remains, such as waste materials and slag, indicates direct evidence of ceramic production. Close to Rahmat Abad, the sites recorded as numbers 73, 91 and 131 in the Darre-ye Bolaghi survey demonstrate a dense distribution of ceramic production sites, in which kilns and artefacts related to ceramic production have been identified. Those three sites are quite comparable to Rahmat Abad in terms of the large scale of production. At Rahmat Abad, cultural materials of 1.8 m thickness belonged to the Bakun period (Figs 5, 6). As suggested above, however, building activities during the Achaemenian period probably removed the upper portions of the Bakun levels in this part of the mound.

Stratigraphy

Eleven contexts, 7018 to 7028, belonging to the Bakun period were identified from Trench G (Fig. 6; Table 1). These can tentatively be grouped into three main phases. Phase 1 contained the disturbed layers (latest) and consisted of two adjacent contexts, 7018 and 7019, located in the western part of the trench and stratified above context 7017. They covered an area of 90 × 120 cm with a maximum depth of 25 cm. Context 7019 consisted of collapsed, burnt mud bricks with dimensions of 8 × 15 cm, while the adjacent context 7018 was very ashy with charcoal remains. Phase 2 was distinguished by an oven and ash and included contexts 7020, 7021 and 7022. Context 7020 extended across the entirety of the trench and had a depth of 160 cm, but contexts 7022 and 7021 were located in the eastern part of the trench only. Context 7022 represented a small circular oven, measuring 30 cm in diameter and 8 cm in depth. It had a reddish colour from heat
and was covered by a 20 cm-thick layer of ash (context 7021). The fill was composed of compact clay and stones that were blackened from being exposed to heat. Contexts 7021 and 7022 yielded no ceramics.

Phase 3 deposits were stratified below the oven discussed above and so have been defined as a separate occupation phase. Contexts 7023 to 7028 belong to this phase, which had a maximum depth of 90 cm. Context 7020 is also included in this phase since it directly overlays 7026 and 7023, and is partly adjacent to 7024 and 7025. A mud brick wall (context 7025) 85 cm in length was identified in the eastern section of the trench. A total of nine courses of mud bricks were defined, each \(7 \times 25 \times 25\) cm in dimensions. Associated with this wall were layers of soft ash (context 7024), around 15 cm in depth and covering an area of roughly \(70 \times 50\) cm. Close to this eastern section, five stones were found, varying in size and covering an area of roughly \(80 \times 30\) cm. They do not appear to have been structural and their function is unclear. In the south and southeastern part of the trench, contexts 7026 to 7028 were excavated. These had a maximum depth of 35 cm and extended over an area of roughly \(60 \times 200\) cm. Context 7027 was about 30 cm thick, consisting of compact soil. This was stratified below context 7026 and above context 7028, both of which were characterised by ashy sediments. Context 7026 also had inclusions of charcoal and small stones. Very little cultural material was found in contexts 7026 and 7027. Context 7028 contained principally Bakun sherds but with some, probably intrusive, Neolithic sherds, as well as lithics and some animal bones. Stratified directly below the Bakun deposits, without any sterile layer, were Neolithic layers, although occupation was clearly not continuous (see below).

**Relative chronology**

The pottery from these phases is typical of the Bakun period. It is fine and primarily handmade, with signs of the occasional use of a slow wheel. The surface is painted (black on buff or red on buff) with geometric and simple animal designs, sometimes on both sides. The finer vessels have mineral temper, whereas larger vessels have mineral and vegetable temper (Figs 14, 15). In some cases, the pottery is deformed and has melted as a result of the kiln temperature becoming too high. In these instances the black paint has turned dark green. Most of the ceramics consist of bowls, beakers, small cups and small jars.\(^{12}\) For the purposes of the following analysis, Early Bakun is thought to be represented at Bakun B and Tall-e Gap I; the Middle Bakun at Tall-e Gap II; and the Late Bakun at Tall-e Bakun A and Tall-e Nokhodi.\(^{13}\)

The pottery from the disturbed layers, in Phase 1, has typical motifs of the Middle Bakun phase such as rectangles filled with dashes, vertical zigzags, and diamonds with a strip across the middle.\(^{14}\) Nearly all of the remaining pottery came from context 7020, which extended over Phases 2 and 3. Accordingly, the dates of these two phases will be discussed together. In contrast to Phase 1, none of the typical Middle Bakun motifs such as dotted backgrounds and the designs described above were found in Phases 2 and 3. The occasional motif from 7020 can be compared with Tall-e Gap II;\(^{15}\) however, the best parallels are found with early Bakun ceramics (e.g.,


\(^{13}\) Sami 1971.

\(^{14}\) Egami and Sono 1962, fig. 13: 5, 6 and 7 (dashes), fig. 15: 5 (vertical zigzags), pl. XXXA: 9 and 10 (diamonds).

\(^{15}\) Egami and Sono 1962, fig. 20: 7.
Fig. 14. Representative Bakun pottery sherds from Trench G
Fig. 15. Middle Bakun pottery samples of Trench G

Fig. 16. Diagnostic painted clay spindle whorls from the Middle Bakun (Gap) layers of Trench G
context 7020/ RN.7128, 7204). Although the lack of data makes any chronological attribution tentative, it seems most probable, based on the available evidence, that Phases 2 and 3 span the Early to the early Middle Bakun periods.

Two painted pottery spindle whorls with fabric directly comparable to the associated pottery were found in Trench G. They are conical in shape, handmade with fine mineral temper and are buff in colour with black geometric designs (Fig. 16). Similar conical-shaped spindle whorls with painted decoration were found at Tall-e Gap, primarily in the earliest levels, Tall-e Gap Phase I (Levels 14b, 15, 16 and 17), but also in Phase II (Levels 5b and 10).16 Cone-shaped painted and unpainted spindle whorls were also found during the excavations of Tall-e Bakun B.17 Spindle whorls have been found at Tall-e Bakun A as well, although Alizadeh remarks that in sharp contrast to the earlier specimens, those from Tall-e Bakun A tended to be unpainted and simpler in form.18 This evidence further supports the dating of these phases of Rahmat Abad to the earlier part of the Bakun period.

**Absolute chronology**

Although several Bakun-period sites have been excavated within the region, most of them have been dated only by relative chronology. The radiocarbon dates from Rahmat Abad are therefore important to refining the Bakun chronology. The second season’s excavation in Trench G yielded two new radiocarbon determinations. The first was from a charcoal sample, TKa-15309, found in context 7020 and gave a calibrated date of 4945–4763 BC (5965 ±40 uncal. BP). The second was from charcoal found in an ashy layer, context 7026, and gave a calibrated date of 4852–4702 BC (5910 ±40 uncal. BP; Figs 11, 12; Table 4). These dates are in accord with the suggestion that Rahmat Abad Phases 2–3 correspond to the Early/early Middle Bakun period. Based on dates for the Shamsabad period from Tall-e Jari A and Tall-e Bakun B, a date of around 5000 BC can be postulated for the beginning of the Early Bakun period.19 For the subsequent Middle Bakun sub-phase, we have one date from Toll-e Nurabad,20 whose pottery assemblage is comparable with that of Gap II. The dates, a range of 4745 to 4502 cal. BC,21 fall fairly neatly in between these two parameters.

**The Pottery Neolithic Period**

Recent archaeological campaigns in the Fars region have yielded a number of Epipalaeolithic and subsequent sites in the Arsanjan and Darre-eye Bolaghi (Tang-e Bolaghi) valleys, dating back to ca. 18,000–8000 cal. BC. The cave site of TB-75 (Haji Bahrami Cave) yielded evidence of “Proto-Neolithic and/or aceramic Neolithic” occupation in Layers 4–3, dated from the late tenth

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16 Egami and Sono 1962, p. 34, pl. XL.
17 Alizadeh 2006, p. 40; Egami and Sono 1962, pl. 4.
19 See Alizadeh 2006, p. 120, table 9.
20 Potts and Roustaei 2006.
21 Weeks et al. 2006, p. 68, table 3.2.
to the mid-eighth millennia cal. BC, above the Epipalaeolithic layers. This information is valuable in dating the beginning of the Neolithic period in the Fars region, although the cultural remains of the “Proto-Neolithic and/or aceramic Neolithic” occupation have been poorly documented. On the other hand, the end of the Neolithic period in Fars is relatively well defined. As with ending of the Neolithic period in other parts of central Iran, it is dated from around 5200 cal. BC, the Shamsabad phase. The Neolithic period of Fars in these millennia is divided into Pre-Pottery and Pottery Neolithic; Tepe Rahmat Abad is the first Neolithic site in the region at which both of these phases were documented in secure stratigraphic contexts. The Pre-Pottery and Pottery Neolithic phases comprise cultural deposits of 3.5 m thickness in Trench G (Figs 5, 6).

Among these, 1.5 m belongs to the Pottery Neolithic layers (Contexts 7029–7031), situated directly beneath the Bakun layers. Compact soil, ash and burnt layers with Neolithic materials were recovered, but no structural evidence was found.

Eight clay objects found in Trench G (Fig. 17) belong to the Pottery Neolithic. They are neatly made and were fired well. They are cylindrical in shape but tapered to a blunt point at one end. Such objects have also been found at other Neolithic sites in Fars, including Tall-e Mushki.

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22 Tsuneki and Zeidi 2008.
23 Pollard et al. 2012.
24 Fukai et al. 1973, pls. XIV: 2, XV: 25, XXXVIII and XXXIX.
Tol-e Bashi\textsuperscript{25} and Tol-e Nurabad.\textsuperscript{26} The excavators of Mushki suggest that such objects were used as ornaments for earrings,\textsuperscript{27} while others have suggested that they may have served as labrets, gaming pieces, mullers, cosmetic mortars, or memorial objects.\textsuperscript{28} The function of these objects therefore remains unclear.

**Pottery assemblages**

In total 75 pottery sherds were found in the Pottery Neolithic layers of Trench G (Figs 18, 19). The ceramics are all handmade and fired at low temperatures. Red or reddish ware shows organic temper, while coarse wares show chaff. Most of the Neolithic sherds are unpainted but some of them are painted with very simple black lines. The vessels had simple rims with flat bases and carinated bodies. No complete vessels were recovered but the majority of sherds belonged to bowls. The red slipped bowls, with painted motifs such as geometric lines and dots, parallel lines, ladder lines and simple cross lines and oblique and vertical ladder motifs (Fig. 19: 4, 8, 9, 22, 24–32, 34, 35, 37, 42, 51 and 53), resemble those of Tall-e Mushki.\textsuperscript{29} However, some motifs are simpler than those of the classic Mushki and others are comparable with the Bashi motifs.\textsuperscript{30} Further, motifs unknown at either Mushki or Bashi (Fig. 19: 2, 5, 10, 13, 33, 38, 46, and 48) are also present. Interestingly, all of the sherds from the lowest Pottery Neolithic layers are just simple ones without any decoration. They are fragile and made of a coarse, almost reddish ware with chalk tempers. Unfortunately, no complete vessels were found. Yet there were some simple rims and the most common form was simple bowls (Fig. 19: 16, 20, 65–73). The future study of these sherds may lead to subdivision of the Neolithic pottery sequence in this trench.

**Chronology**

The relative chronology of the Pottery Neolithic in Fars is far from clear. It was Vanden Berghe who initially identified distinct ceramic wares at Tal-e Mushki and Tal-e Jari, carried out a series of test excavations, and proposed a sequence of Jari followed by Mushki.\textsuperscript{31} Full-scale excavations were conducted between 1959 and 1971 by the Tokyo University Iraq-Iran Expedition at Tal-e Jari A and B\textsuperscript{32} and at Tal-e Mushki.\textsuperscript{33} Based on their more extensive investigation, they proposed a new sequence of Mushki followed by Jari.\textsuperscript{34} Unfortunately, the two phases were never found clearly stratified in relation to one another in one site, so the dispute regarding the order of their succession continued until recently. Studies of the ceramic decorative motifs, regional

\textsuperscript{25} Pollock et al. 2010, p 184.
\textsuperscript{26} Weeks et al. 2010, p. 252–254, fig. 3: 189.
\textsuperscript{27} Fukai et al. 1973, fig. 99, table 49.
\textsuperscript{29} Nishiaki 2003; Herzfeld 1929.
\textsuperscript{30} Pollock et al. 2010, pp. 148–151, fig. 24: 23, 41, 45.
\textsuperscript{31} Vanden Berghe 1952, pp. 212–214, figs 28 and 29; 1954, pp. 41–42, 394.
\textsuperscript{32} Egami and Sono 1962; Egami et al. 1977.
\textsuperscript{33} Fukai et al. 1973.
\textsuperscript{34} Fukai et al. 1973, p. 77.
Fig. 18. Pottery sherds of the Pottery Neolithic phase
parallels, settlement data, and, more recently, new radiocarbon dates\textsuperscript{35} all, however, support the sequence proposed by the University of Tokyo team.

More recently, this sequence has been further refined by the excavators of Toll-e Bashi, who identified a “Bashi” transitional phase between Mushki and Jari.\textsuperscript{36} The lowest layer of this

\textsuperscript{35} Maeda 1986 (ceramic decorative motifs); Voigt and Dyson 1992, pp. 135–137 (regional parallels); Sumner 1990, 1994 (settlement data); Nishiaki 2010a (radiocarbon dates).

\textsuperscript{36} Bernbeck \textit{et al.} 2003; Pollock \textit{et al.} 2010.
sub-phase, Level VI, appears to correspond partly to Mushki’s TMB pit.\textsuperscript{37} Table 2 below provides a tentative summary of the chronological positions and the dates of the related Neolithic sites. More recently discovered sites such as those at Mian Rud\textsuperscript{38} and the Qasr-e Ahmad survey\textsuperscript{39} have been omitted because of the unavailability of detailed published data. The dating of Kushke Hezar\textsuperscript{40} and Kutaht\textsuperscript{41} is likewise uncertain and so they have not been included in the table for the time being. The Pottery Neolithic layers of Rahmat Abad did yield one new radiocarbon date. A charcoal sample, TKa-15311 from Context 7029, one of the latest Pottery Neolithic layers in Trench G, provided a radiocarbon determination of 6217–6028 cal. BC (7245 +/- 45 uncal. BP, 95.4% accuracy) (Figs 11, 12; Table 4). This falls within a time range comparable to the latest layer, Level I, at Mushki.\textsuperscript{42}

<table>
<thead>
<tr>
<th>Date</th>
<th>Archaeological Phase</th>
<th>Rahmat Abad</th>
<th>Mushki</th>
<th>Bashi</th>
<th>Jari B</th>
<th>Jari A</th>
<th>Nurabad Trench A</th>
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Table 2. The chronological sequence of related Neolithic sites in Fars (all dates are in cal. BC).

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<th>Date</th>
<th>Archaeological Phase</th>
<th>Rahmat Abad</th>
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<th>Bashi</th>
<th>Jari B</th>
<th>Jari A</th>
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Pre-Pottery Neolithic: Rahmat Abad Phase

Stratigraphy

This phase represents the first reliable evidence of Pre-Pottery Neolithic occupations in Fars, for which we propose a term, the "Rahmat Abad phase", in this paper (Table 1; Fig. 6). The Pre-Pottery Neolithic layers were found stratified directly below the Pottery Neolithic deposits, although they are considerably earlier in date. A total of nine contexts were defined (7032 to 7040) for the 2 m-thick Pre-Pottery Neolithic deposits. Again, no structural features were identified, only layers of soil and ashy/burnt layers. The cultural materials found in this phase were lithics (Fig. 20), animal bones and some charcoal samples.
Chronology

Three radiocarbon dates were obtained from the Pre-Pottery Neolithic layers in Trench A during the first season of excavation at Rahmat Abad. All of them indicate a date of the late eighth to the early seventh millennium BC (Table 3).

<table>
<thead>
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<th>Lab number</th>
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<th>Material</th>
<th>Lab date bp</th>
<th>Calibrated date BC (2 sigma range)</th>
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<td>Unit A Loc 62, Level A VII</td>
<td>charcoal</td>
<td>7925 ± 75</td>
<td>7050–6640</td>
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</table>

Table 3. Radiocarbon dates for the Pre-Pottery Neolithic layers of Trench A

In the second season, we sampled a charcoal deposit, TKa-15313, from context 7032 of Trench G (Table 1), which corresponds to the latest layer of the Pre-Pottery Neolithic (Figs 5, 6). This provided a date of 7047–6743 cal. BC (7970 ± 45 uncal. BP, 90.4% accuracy) (Figs 5–13; Table 4), which is virtually indistinguishable from the dates from the Trench A sounding. Thus we now have good evidence to suggest that the latest Pre-Pottery Neolithic at Rahmat Abad can be dated from the late eighth to the early seventh millennium BC. However, we should note that Pre-Pottery Neolithic deposits continue 2 m downwards from this level. It is hoped that radiocarbon dates can be obtained for these layers in the future. Potentially, dating of the earlier layers may help to investigate the transitions from the Epipalaeolithic, as known at the Haji Bahrame Cave, to the Pre-Pottery Neolithic.

Subsistence economy

Recently, Weeks synthesised the long-term development of subsistence economy in the Fars region from the Epipalaeolithic to the Neolithic, indicating that farming communities emerged in the region during the eighth millennium BC. The early Neolithic economy of the Fars region included a combination of cultivation of two-row and six-row barley, emmer and einkorn wheat, and bread wheat, and herding of domesticated sheep, goats and cattle. At the same time, the communities exploited wild plant and animal resources, by means such as hunting, to supplement their food resources. Further to the south, in the Kerman district at Tepe Yahya and Daulatabad there is early evidence of cultivation of einkorn, emmer wheat, barley and grapes, and of the keeping of domestic animals such as cattle, sheep and goats. It seems that even during the sixth millennium BC, the suitable environment of the region also allowed communities to exploit wild resources such as gazelles, wild boar, onager, birds and land tortoises.

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45 Weeks 2013.
46 Miller and Kimiaie 2006.
47 Mashkour et al. 2006.
48 Maeda 1986.
Evidence on plant cultivation is available at Rahmat Abad, while that of the animal exploitation is as yet under study. Tenberg (personal communication) reveals the presence of crop plants, consisting of hulled and free-threshing barley (*Hordeum vulgare*), emmer wheat (*Triticum dicocorum*) and free-threshing wheat (*Triticum cf aestivum*). The latter is noted only in small amounts in samples from the Neolithic and Chalcolithic levels, and seems thus far to be absent in the Pre-Pottery Neolithic levels. The cereal remains analysed to date all correspond to domesticated species and there has been no indication of the gathering of wild cereals at the site. Remains of what seem to be cultivated pulses of pea-type (*Vicia/ Pisum*) are also attested (two seeds) from Chalcolithic contexts. Besides these traditional crops (wheat, barley and pulses), the plant assemblage at the site consists of pistachio nuts, without doubt gathered from the surroundings, and seeds/fruits from a series of wild herbaceous plants (grasses, mustard family, wild pulses, etc.) that are likely to correspond to weeds cleaned out from crops.

**Lithic industry**

Trench G yielded 239 flaked stone artefacts from the Pre-Pottery Neolithic layers (Fig. 20). The vast majority of them are made of local chert (N = 201), while a far smaller number of limestone (N = 36) and obsidian artefacts (N = 2) are also present. The limestone assemblage consists of only unretouched flakes, probably corresponding to waste pieces from ground stone manufacture.

Fig. 20. Selected flaked stone artefacts from the Pre-Pottery Neolithic phase of Trench G
The obsidian pieces are regular bladelets (Fig. 20: 8, 9), most likely to have been imported from the Anatolian obsidian sources.

The local chert assemblage represents a distinct bladelet industry, characterised by the predominant use of pressure debitage. The cores are bullet-shaped with a single platform, displaying regular bladelet removal scars at the body’s periphery (Fig. 20: 1). The retouched tools are also dominated by bladelets, but include some blades as well. The most common tools are sickle elements (Fig. 20: 3, 4). These are regular blades and bladelets that retain glossed edges and snapped ends. Rare but distinct tool types worthy of mention are backed and/or obliquely truncated bladelets (Fig. 20: 7). The occurrence of a microburin suggests use of the microburin technique for manufacturing these bladelet tools (Fig. 20: 6). The remaining retouched tools include diverse retouched, denticulated and notched blades/bladelets, as well as a few burins (Fig. 20: 5).

The features described above show that the Rahmat Abad industry is most comparable to the Early M’lefatian, defined by Kozlowski after the Pre-Pottery Neolithic assemblages of Tell M’lefaat in northern Iraq. The occurrence of a M’lefatian assemblage at Rahmat Abad attests that the Pre-Pottery Neolithic communities of the Fars region shared the tradition that was geographically distributed from the northern part of the Zagros Mountains to the southwest. It is important to note that the Rahmat Abad assemblage (Fig. 20) differs from the lithic assemblages recovered from “Proto-Neolithic and/or Pre-Pottery Neolithic” layers of Haji Bahrame Cave. The latter assemblages, some of which date from as late as the early eighth millennium BC, reportedly contain numerous end-scrapers but no sickle elements. These artefacts are rather reminiscent of the earlier tradition. Accordingly, the Rahmat Abad material provides us with a valuable benchmark for the presence of an indisputable Pre-Pottery Neolithic lithic industry in Fars by the end of the eighth millennium BC. At the same time, the distinction between the Pre-Pottery Neolithic and the Pottery Neolithic assemblages at Rahmat Abad (Fig. 21) is also notable. The

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Fig. 21. Flaked stone artefacts from the Pottery Neolithic phase of Trench G. Left: blade and bladelet tools, Right: Geometrics and bladelet tools

49 Kozlowski 1999.
50 Tsuneki and Zeidi 2008.
latter assemblage, with its best parallels seen at Tall-e Mushki,\(^{51}\) is characterised by the more common production of wider blades and flakes, and the predominant use of geometric arrowheads. The absence of these elements in the Pre-Pottery Neolithic phase of Rahmat Abad should certainly reflect a chronological gap of several centuries between them. The transitional processes from the Pre-Pottery to the Pottery Neolithic in Fars await investigation in the future.

**Conclusion**

The cultural sequence revealed at Tepe Rahmat Abad is unique amongst the excavated sites of the Fars region. Of particular significance are the repeated human occupations at this small mound over the millennia since the early Neolithic period. The geographical location of the site, its easy access to the different environmental resources such as rivers, fertile soil, mountains and forests, and its strategic location, especially during the historical periods, attracted human groups to this mound at several points in time.

The oldest Pre-Pottery Neolithic layers are the first of their kind identified in the whole region of Fars. Our preliminary analysis of the associated materials and radiocarbon dates demonstrates that the Neolithic economy existed in the region by the end of the eighth millennium BC. Comparable settlements appear to have been common in the region, as suggested by our recent soundings at Gasr-e Ahmad in Qar-e Aghaj river basin, Kavar plain.\(^{52}\) Although the origin of the first Neolithic community in Fars has not been clarified yet, close ties with communities in other parts of the Zagros Mountains are attested by the lithic industry. In order to facilitate further comparative analyses of the Rahmat Abad material with data from the preceding sites and other regions, we provisionally call the Pre-Pottery Neolithic of Fars the “Rahmat Abad phase”.

The next occupations at Rahmat Abad are dated from the Mushki phase of the early Pottery Neolithic, with a radiocarbon date of the seventh millennium BC for the uppermost level. The combination of the radiocarbon dates for the Rahmat Abad and the Mushki phases at Rahmat Abad indicates that the transition from the Pre-Pottery to the Pottery Neolithic took place sometime between 7047–6744 cal. BC and 6218–6028 cal. BC. Based on our excavations of Trench G, there was no structural evidence in either the Pre-Pottery or the Pottery Neolithic layers, but what were recovered were fireplaces, small pits and ashy deposits. Whether or not this observation implies a rather ephemeral or seasonal occupation during the earlier Neolithic periods at Tepe Rahmat Abad is yet unknown, given the relatively small excavation areas. However, it is interesting to recall relatively poor structures at the contemporaneous site of Tall-e Mushki,\(^ {53}\) and the far more substantial mud-brick architecture known in the next Pottery Neolithic phase (Jari).\(^ {54}\)

The results of the first two seasons’ excavations show that Rahmat Abad was abandoned at the end of the seventh millennium BC for around 1000 years. This Neolithic mound was then reoccupied at some point during the Early Bakun phase and continued to be occupied in the

\(^ {52}\) Azizi Kharanaghi 2012.
\(^ {53}\) Nishiaki 2010a, p. 6.
\(^ {54}\) Nishiaki 2010b, pp. 116–118.
Middle Bakun phase. One of the important activities performed at Rahmat Abad during the Middle Bakun phase was pottery production. Abundant evidence related to industrial activity, including pottery kilns, thick ash deposits, kiln wasters and thousands of pottery sherds was identified. Tepe Rahmat Abad was abandoned once again after the Middle Bakun phase and not reoccupied until the Achaemenid period. The appeal of Rahmat Abad probably lay in its strategic location on the king’s road between Pasargadae and Persepolis. The Achaemenid mud-brick structure with a curvilinear plan found in Trench G was probably an official building with a function related to control and monitoring of this route. Evidence related to the most recent occupation at Rahmat Abad belongs to the Islamic Qajar period. In the Qajar period, nomads used the top of the mound as a cemetery. Despite its small size, Rahmat Abad contains rich evidence of a long history of human occupations dating back to the Neolithic times. It should certainly serve as one of the important reference sites by which our understanding of the prehistoric and early historic cultural developments of the region would be greatly improved.

<table>
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Table 4. Radiocarbon dates for different phases of Trench G

Biblography


Bernbeck, R., Pollock, S. and Abdi, K.  

Bernbeck, R., Fazeli Nashli, H. and Pollock, S.  

Bernbeck, R., Abdi, K. and Gregg, M.  

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