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LARGEST ANCIENT FORTRESS OF SOUTH-WEST ASIA AND THE WESTERN WORLD?

RECENT FIELDWORK AT SASANIAN QALEH IRAJ AT PISHVA, IRAN

By Mohammadreza Nemati, Mehdi Mousavinia and Eberhard W. Sauer, with a contribution by
Carlo G. Cereti

Abstract

Protected by a massive wall, but devoid of permanent buildings in its vast c. 175 ha interior, the rectangular compound of Qaleh Iraj near Tehran must be a military base – and as such, it is arguably the largest fortress in the ancient world to the west of modern Afghanistan. Investigations carried out previously have been based on surface finds and architecture and there had been no agreement on the date and purpose of this monument. Excavation, survey, in-depth studies of its architecture, satellite images and historical sources and the application of scientific dating have now enabled us to precision-date the earliest activity in the south-eastern gateway and the likely construction date of the fortress and to place it in its proper historical context. Sasanian Qaleh Iraj may have played a pivotal role in the northern defensive network of one the Ancient World's most powerful empires and the fortress sheds significant new light on its military capabilities.

Keywords

Late Antique Warfare; Qaleh Gabri; Qaleh Iraj; Rayy; Sasanian Empire

I. INTRODUCTION

In spite of its central importance for the history of Iran, the Tehran Plain, at the heart of the Sasanian province of Rayy,¹ has so far received little archaeological attention. Its crossroad location, on the major ancient lines of communication between west, east, north and south, explains why the vast fortress of Qaleh Iraj was built here – not far from the ancient and medieval city of Rayy and near Tehran, the modern capital of Iran – and why the region flourished throughout the historic era. Qaleh Iraj (at Pishva), 3-4 km north-east of the centre of Varamin and next to the village of Asgarabad (Figs 1-2), covers an area of as much as c. 175 ha (excluding its wall and ditch). It is remarkable not only for its extraordinary size, but boasts also unusually tall and wide walls, incorporating numerous guard-chambers, all interlinked via a sophisticated corridor network.

Few studies have been devoted to Qaleh Iraj previously. Relying on surface materials and extant architecture, a wide range of hypotheses have been proposed as to the monument's function and construction date. Some identify it with the four-cornered city of Varena cited in the *Vendidad*,² and others believe its ruins are those of pre-Islamic Rayy.³ It has been dated to the Parthian, Sasanian and Islamic eras, and there is no agreement if it was a city or a fortress.

Through an appraisal of new evidence from surveys and excavations, satellite imagery and scientific dating, a thorough investigation of its defensive perimeter, a systematic survey of its intramural space and a re-examination of historical sources on Rayy, the present work seeks to provide answers to the following crucial questions: when was the site first constructed and used,

¹ The precise extent of the province is unknown: Gyselen, *La Géographie administrative*, 57, 73-74.

² *Vendidad* 1.17; Etemad al-Saltaneh = ed. Navaei, *Etemad al-Saltaneh*, 179-81.

³ Etemad al-Saltaneh, *Tatbiq-e Logat-e Jografiae*, 34; Pirnia, *Tarikh-e Iran-e Bastan* 3, 2217.

and when was it ultimately abandoned? What function did this vast and extraordinary monument serve?

II. HISTORY OF RESEARCH

Qaleh Iraj ('the Castle of Iraj') has attracted moderate scholarly interest only, despite its archaeological prominence. To the best of our knowledge, Edward B. Eastwick was the first to explicitly refer to the site ('*Kalah i Iraj*'). Visiting it on 22 February 1861, he describes it as a parallelogram of 1,800 x 1,500 yards (i.e. c. 1,646 x 1,372 m) with walls surviving to an estimated height of 50 feet (c. 15 m). Eastwick believed that '*Kalah i Iraj*' was the predecessor of Rayy, whose ancient name '*Rhages*' he thought derived from '*Iraj*'. Whilst implying it was a very ancient town abandoned before its population moved to Rayy, he also describes it as a 'fort'.⁴ Etemad al-Saltaneh (1843–1896), a politician under the reign of Nasser al-Din Shah (1848–1896), labels it '*Qaleh Gabri*' – i.e. 'Zoroastrian Castle' (a name it shares with other fortifications thought to date back to pre-Islamic times⁵). Describing the remains of its walls as well as other vestiges, he equates it with the four-cornered Varena, mentioned in the Vendidad,⁶ and concludes that it was over 2,000 years old.⁷ In a separate publication, he tentatively identifies Qaleh Iraj with pre-Islamic Rayy,⁸ a

⁴ Eastwick, *Journal*, 285, cf. 273-74.

⁵ Sauer et al., *Persia's Imperial Power*, 309, 364-68, 372, 637-38; Rante "Ray"; *Rayy*, 28, 31, 49, 126, 128.

⁶ Vendidad 1.17.

⁷ Etemad al-Saltaneh = ed. Navaei, *Etemad al-Saltaneh*, 179–181, originally published in 1877.

⁸ Etemad al-Saltaneh, *Tatbiq-e Logat-e Jografiae*, 34, first published in the 1890s.

view repeated thereafter by Pirnia in the 1920s, who informs us that ‘Rayy City is located at the place of the present-day ruins of Qaleh Iraj and its environs’.⁹

A vast rectangular compound, with defensive towers spaced 30 m apart, visited by Jane Dieulafoy (1851–1916) and her husband, Marcel-Auguste Dieulafoy (1844–1920), on 16 June 1881, and described and depicted in her travel accounts, was unquestionably Qaleh Iraj.¹⁰ Quoting her husband, she describes the monument as an ancient entrenched camp (‘un ancien camp retranché’),¹¹ i.e. a military rather than an urban site, aptly observing that there were no walls or mounds in the interior. She thought that the monument and other fortifications in the area formed a formidable defensive system directed against invasions from Khorasan. On the basis of the architecture of its mudbrick walls, she concludes that it was undoubtedly a Sasanian monument.

The Dieulafoys’ astute observations were not taken on board by later scholars. George N. Curzon (1859–1925) visited Qaleh Iraj and provided a general description, yet was unsure as to its chronology, if not hesitating in assigning the compound to ‘a remote antiquity’.¹² In their short report on their 1909 survey of the Tehran Plain, G. Pézard and G. Bondoux published a general plan of the site, discuss its architecture, and suggest it was a castle or a town, but fail to comment on its date, except for noting that it must have been abandoned in very ancient times.¹³ Silvia Anne Matheson makes a passing reference to Qaleh Iraj (‘Qal’eh-Gabr’). Offering no opinion of her own as to the monument’s date and function, she cites Heinz Luschey’s view that it was an early Islamic

⁹ Pirnia, *Tarikh-e Iran-e Bastan* 3, 2217.

¹⁰ Dieulafoy, *La Perse*, 142-45.

¹¹ Dieulafoy, *La Perse*, 142.

¹² Curzon, *Persia*, 352-53.

¹³ Pézard and Bondoux, “Mission de Tehran”, 61-63.

fortification – as well as unspecified sources preferring an interpretation as (surprisingly heavily defended) royal hunting grounds of the Sasanian era¹⁴ – a hypothesis rightly questioned by Wolfram Kleiss.¹⁵

Wolfram Kleiss's visit to the site on three separate days and the resulting publications represent an important study, offering a meticulous description of surface finds and the monument's architectural characteristics. Kleiss discusses the monument in more detail than any previous scholar and was the first to produce a series of reconstruction drawings (Fig. 3). Based on ceramics collected in the interior, he assigns the complex to the Partho-Sasanian era – the architecture in his view pointing to Parthian rather than Sasanian origins. Dating the last major rebuilding phase to early Islamic times, he postulates the fortification continued to be used until the Mongol invasions.¹⁶

As part of his survey of Varamin District in 2001, Mohammadreza Khalatbari visited Qaleh Iraj and provides a general description of the site.¹⁷ Further work was carried out in 2002, as part of the Qaleh Iraj Documentation Project by the Technical Office for Conservation and Restoration, Vice Presidency of the Iranian Cultural Heritage Organization. Directed by Afshin Farzin, the project resulted in the inscription of the site on the Iranian National Cultural Heritage List in

¹⁴ Matheson, *Persia*, 25.

¹⁵ Kleiss, "Qal'eh Gabri", 300; *Geschichte der Architektur Irans*, 119. See also Kleiss, "Die sasanidische Brücke" on the non-defensive compound crossed by a river at Bisotun, plausibly interpreted as hunting grounds.

¹⁶ Kleiss, "Qal'eh Gabri"; "Parthische Militärarchitektur"; *Geschichte der Architektur Irans*, 119-20.

¹⁷ Khalatbari, *Report*, 397-99.

2003.¹⁸ The report, detailing the surface material recorded and illustrating the upstanding walls (Fig. 4), classifies the site as a Partho-Sasanian city.¹⁹

Excavations by Dr. Mohammadreza Nemati of the Tehran Cultural Heritage Directorate in 2008, 2012 and 2015 represent a turning point in the investigations of the monument. Whilst all previous studies had been based on surface survey, the new phase of exploration involved opening 12 soundings within the site, 18 test trenches in the extramural area and excavations within the south-eastern gateway.²⁰ Documentation of the remains of the walls and a survey of the area surrounding the monument, within a radius of c. 1 km, complemented the excavations.²¹ The archaeological findings presented here are based on his fieldwork.

III. THE ARCHAEOLOGY OF QALEH IRAJ

Including its walls, the rectangular compound measures 1,278-1,285 x 1,455-1,460 m and covers c. 187 ha (or c. 175 ha, excluding the, at the base, 22 m wide walls). Whether intentional or coincidence, the corners of the massive fortification are oriented, more or less, towards the cardinal directions. Surveys by the first two authors inside and around the wall circuit yielded sherds of Chalcolithic, Iron Age, Sasanian, Seljuk, and Ilkhanid date. The assemblage of surface finds from within the compound was identical, in terms of the periods represented, to that from outside.

¹⁸ Farzin, *Documentation Project*.

¹⁹ Farzin, *Documentation Project*, 1-67; Eskandari, "Formal Re-appraisal", 83-90.

²⁰ It has not been possible to discuss in detail further excavations since 2015, and the number of trenches refers to those excavated until then. The key results of our work in 2016 and 2017, shedding significant new light on chronology and architecture, have however been included where appropriate.

²¹ Nemati, *Report*.

Fragments of fired bricks and mudbricks, as well as two fragments of stucco decorations, were, however, found only in the intramural space and exclusively near the western and southern corners.²²

III.1. The Intramural Area

Dr Nemati's surveys and excavations have not solely focused on the formidable fortifications, but also explored the space enclosed by the defensive wall. In the first season of excavations, 12 test trenches were opened in the interior of the fortress, to ascertain whether or not any architectural remains exist therein (Fig. 5). In the western quadrant, the team encountered a compacted clay floor, on a cobblestone bedding, with Sasanian sherds lying on top (Figs 6-7). It is worth stressing that this is the only trace of architecture found so far in the vast intramural area. Examination of satellite imagery and further sondages also failed to reveal any further traces of structures (Fig. 8).²³ The mound and localised scatters of fired brick debris, observed by Kleiss,²⁴ are not of ancient origins and may be the remains of old farm buildings. We may conclude that there is no evidence whatever for extensive architecture in the interior of Qaleh Iraj. This observation and the design of its massive walls provide decisive clues as to the function of the site, as further explored below.

III.2. The Architecture of the Wall

The defensive wall, enclosing a vast empty space, is a massive monument, enforced with projecting semicircular towers (Fig. 9). Between the towers, there are large arches on the outside

²² Kleiss, "Qal'eh Gabri", 298, 304 fig. 17; Farzin, *Documentation Project*, 44; Nemati, *Report*.

²³ Mousavinia, *Archaeological Survey*, 63-70.

²⁴ Kleiss, "Qal'eh Gabri", 290-91 with fig. 2.

of the wall, all connected via a corridor, almost certainly running along the full wall circuit. This corridor, accessible via stairs, provided access to the towers and to a row of rooms within the wall.

III.2.1. The Defensive Wall

Although in part destroyed, in particular in the north-east and west, the wall survives prominently (to a height of up to 14.97 m) elsewhere, especially in south and south-east and parts of the north-eastern side. Its lower and upper sections employ distinctly different architecture. Its stepped lower portion is made of *chineh* (rammed earth), its vertical upper portion is built of mudbrick (Figs 10-11). The wall's width amounts to as much as 22 m at the base and 15 m in the upper (mudbrick) section. The *chineh* section of the wall accounts for about 6 m of the total height on average. The founders of Qaleh Iraj probably built the lower section directly on the surface, without any foundations. On top of the *chineh* section, the wall is vertical, made of mudbricks and rises for a further 9 m (at the highest preserved points), with an average thickness of 15 m (equivalent to the total height of the wall).

III.2.2. Towers

Projecting from the wall on all four sides, we find total of 136 semi-circular towers (36 each per long side and 32 each per short side), as well as four round corner towers, plus two towers each flanking the four gates, making a total of 148 towers. Except for those flanking the gates, they are placed at c. 28 m intervals, edge to edge, or c. 37.50 m, centre to centre (Figs 12 and 17).

The same bipartite, *chineh* overlain by mudbrick, architecture of the wall was replicated in the construction of the projecting towers. Here the *chineh* section is composed of sloping, circular steps and averages between 9.50-14 m in diameter, being c. 6 m high, just as the *chineh* section of

the wall. The mudbrick section of the towers averages c. 9.50 m in diameter and survives up to c. 9 m in height (Fig. 12). In the reconstruction by Kleiss, towers rise slightly above the top of the wall (Fig. 3).²⁵

The towers, as well as the arches between and parts of the corridors, were intentionally filled in with mudbricks (Fig. 13) in the last phase of occupation – but, based on the results of excavations, the rooms continued to be used beyond and were evidently still accessible (perhaps via ladders or ramps from the interior). In some sections, however, passages are preserved that connected the towers to the rooms embedded in the fortification wall (Fig. 14), an observation indicating that towers initially presumably had accessible hollow shafts. The towers are architecturally similar to those at Takht-e Soleiman²⁶ and Bishapur,²⁷ notably in the upper section.

III.2.3. Inner Corridor

Within the wall, there is a corridor, probably running all along the perimeter; sections of this corridor certainly survive on all four sides (Fig. 15). It is readily detectable, due to the severe damage the wall suffered, in particular on its southern, south-eastern, and eastern sides. It was initially 6 m wide (reduced to 2 m in a later phase and completely blocked in a third phase), but its height is unknown, and we do not know how it was roofed. The arched entrances from the corridor to the rooms reached a height of 3.15 m (reduced to 2.37m in a later phase). The floor of the corridor was above the *chineh* section of the wall and at the same level as the lowest courses of the mudbrick wall, almost 6 m above the contemporary surface. As with the towers at this level,

²⁵ Kleiss, “Qal’eh Gabri”, 293 fig. 5.

²⁶ Osten and Naumann, *Takht-i Suleiman*; Naumann, *Die Ruinen*.

²⁷ Sarfaraz et al., *The Ancient City of Bishapur*, 155.

the corridor walls were built of mudbrick. The corridor provided access to the rooms within the wall and to the defensive towers.

III.2.4. Rooms

The row of rooms within the wall, accessible via the corridor, is of particular interest. They are mostly of similar size, and their remains can be seen particularly clearly on the north-west, south-west and south-east sides (Figs 16-18). The rooms are embedded within the wall and face the interior of the fortress. Based on some relatively well-preserved rooms, it appears that they were square or rectangular in plan, the smallest measuring c. 3 x 3 m, the largest, c. 4.90 x 3.60 m. We have no means of estimating their exact height, unless and until future research should detect a room preserved to roof-level. Although few have been examined in detail as yet, their dimensions, arrangement and spacing allows us to make an estimate. The average length of its walls was c. 1,281.50 m by 1,457.50 m. Deducting 6 m for the main corridor and 1.50 m for the parapet on each side, plus a gap of c. 28 m at each gate opening, the length of the row of rooms and connecting corridors would have been c. 1,238.50 and 1,414.50 m. The four symmetrical halves of the long sides would have reached a length of c. 707.25 m each. The two asymmetrical north-western sections of the short sides would have measured c. 657 m, their south-eastern sections, c. 581.50 m. An average room may have been 3.40 m long and 3.60 m wide, an average connecting corridor, 2.95 m long and 1.20 m wide (Fig. 17). Dividing the length of these eight wall segments by these dimensions suggests there were 110 rooms on each of the four halves of the long sides and 90 rooms on each of the two south-eastern sections of the short sides and 102 rooms on their north-western counterparts, plus four corner rooms, a total of 828 rooms. As rooms and connecting corridors were not of uniform dimension and only a few have been examined, the real number of

rooms could be a little higher or lower than our estimate. If the interim, gate and corner towers were initially occupied too, there would have been an additional 148 large rooms, adding up to a total of nearly 1,000 rooms.

Based on the slightly better-preserved rooms, especially in the south and west, it appears that some of the rooms were accessible via passages connecting them with the main corridor, but the majority could only be entered via doorways from neighbouring rooms (Fig. 17). In the west of the compound, parts of division walls survive. Here, partition walls between each pair of rooms are substantially shorter than the width of the rooms. Internal partition walls survive to 1.20 m height, but are only c. 1.00 m long, suggesting that there was probably a doorway between each pair of rooms.

III.2.5. Platforms

In the fourth season of excavations at Qaleh Iraj, we discovered a mudbrick platform, abutting the south-eastern defensive wall on the inside (Figs 9 and 19). It is 29 m long and 4.10 m wide and survives to a height of 2 m. Since the top part of the platform has vanished, we neither know its original height, nor how it relates to the structures within the wall nor its function. In the light of the military function of Qaleh Iraj, which will be discussed in detail below, it may well be related to the military character of the site. Perhaps it served as a podium used by commanders to address their troops or observe them during military drills. Platforms thought to serve a similar function are also known from Roman military establishments.²⁸ Alternatively, as the walls themselves would have provided a perfect observation platform, could it have been a ramp providing access to the wall? Another similar platform, also abutting the south-eastern side of the defensive wall, is

²⁸ Petrikovits, *Die Innenbauten*, 73, 141, 172-73 no. 71; Johnson, *Roman Forts*, 30, 111, 126, 217.

visible at a distance of 245 m south-west of the former, perhaps adding strength to an interpretation of these features as ramps. Yet, no stairs were observed on either platform. The purpose of the platforms remains a matter of speculation, notably until more extensive excavations will cover a greater proportion of the site.

III.2.6. Arches

A further important component of the wall's architecture are the arches within the wall's mudbrick section. It is impossible to determine the exact number of arches that once existed between each pair of towers, as they were walled up and damaged later. Based on better-preserved sections of the wall, however, in particular on the north-eastern, south-eastern and south-western sides, there were four arches between each pair of towers. Next to some towers, two extra arches existed at a lower level (Fig. 12). The third season of excavations at the site revealed that the lower arches form narrow entrances to (or exit routes from) the main inner corridor from (or to) the exterior area. Maybe these served as postern gates for sorties. One further arched doorway each provided access, from the main corridor, to each tower (Figs 11-18). On many of the structures within the wall, such as the arches, between two and 12 layers of clay plaster are discernible, probably indicating that they had been in use for a long time.

The monumental size of the outer arches, which could be reached via the main corridor, is reminiscent of royal architecture. They were all blocked later with walls, on the side of the main corridor (Fig. 13). Sometimes, there were arrow-slots within the arch-blocking walls (Fig. 20). These major architectural modifications must have been made on the grounds of security, to prevent enemies from potentially gaining access to the interior via these upper-storey arches (Fig. 21).

There are two types of arches at Qaleh Iraj, rounded and pointed. The former was in common use in the Parthian and Sasanian periods, and similar arches are found at a number of sites, such as Qumis,²⁹ Kuh-e Khwaja,³⁰ Hatra,³¹ Qaleh Dokhtar near Firuzabad,³² Bishapur³³ and Taq-e Kisra³⁴ (as well as at Sarvestan,³⁵ now dated to the early post-Sasanian era³⁶). Whilst the latter tend to occur in Islamic architecture,³⁷ there are also pre-Islamic examples, such as the rear blind arcades of the Taq-e Kisra,³⁸ the secondary rooms at Qasr-e Shirin³⁹ as well as on decorations on bronze⁴⁰ and a silver plates.⁴¹

III.2.7. Gates

Even though large parts of the defensive wall are heavily damaged or completely destroyed, it is clear that there were four gates in the middle of each of the two long sides and close to the centre (if slightly asymmetrical, in terms of unequal number of towers and length of wall on each side)

²⁹ Hansman and Stronach, "Excavation at Shahr-i Qūmis", 44 fig. 7.

³⁰ Ghanimati, "New Perspectives", 139, pl. XXIV.

³¹ Safar and Mustafa, *Hatra*, 374-85.

³² Huff, "Qal'a-ye Dukhtar", 148-49 figs 8-9.

³³ Sarfaraz et al., *The Ancient City of Bishapur*, fig. 4.47.

³⁴ Bruno, "The preservation and restoration", pl. 22.

³⁵ Bier, *Sarvistan*, figs 7-22.

³⁶ Djamali et al., "On the chronology", 137-38.

³⁷ Pope, "A Sasanian Garden Palace", 79-83; Huff, "Architecture", 329.

³⁸ Reuther, "Sasanian Architecture", 513.

³⁹ Mohammadifar et al., "A Typological Analysis", 96.

⁴⁰ Reuther, "Sasanian Architecture", 511.

⁴¹ Reuther, "Sasanian Architecture", 513.

in each of the two short sides (Fig. 9). Of these four gates, only the south-east gate is in a fairly good state of preservation, whilst the others are heavily damaged. Gate towers projected further beyond the face of the wall than interim towers. Qaleh Iraj's projecting monumental gates, with gate tower spacing being much narrower than that between all other towers, closely resemble those of the Sasanian campaign base of Qaleh Kharabeh.⁴² The narrow gateway through Qaleh Iraj's south-east gate followed a zigzag alignment (Fig. 24), slowing down enemies in case of a successful assault. Trapped in the narrow passage, enemy trespassers would have been an easy prey for archers stationed on the tall towers, as would have been reinforcements approaching the projecting gates. Whilst undoubtedly also built to impress, the monumental gates were not designed for easy access – let alone orderly processions, their primary purpose was clearly defensive.

III.2.8. Staircases of the South-east Gate

In the second season of excavations, two staircases were discovered on either side of the south-east gate, near the entrance to the fortress (Figs 22-24). Perhaps, they provided access to the rooms within, and towers along, the defensive wall, via the main corridor. Both staircases lie exactly in line with the main corridor and probably belong to the earliest construction phase. How precisely they connected the main corridor with the gateway remains uncertain. Multiple layers of plaster on the stairs in both staircases indicate that they were refurbished repeatedly and used over an extended period of time.

IV. DATING EVIDENCE

⁴² Sauer et al., *Persia's Imperial Power*, 321-24, 372.

Crucial for historical significance of Qaleh Iraj is, of course, the chronology of its original construction and eventual abandonment. Earlier dating proposals have been outlined above and, as already pointed out, all hinge on surface finds from the interior and the architecture of the wall. Through excavation and scientific dating, we have been able to refine the chronology substantially and date the construction of the monument securely.

As already stated, surveys in the area confined within the defensive wall have produced sherds from the Chalcolithic, Iron Age, and the Sasanian, Seljuk, and Ilkhanid eras. Pottery of the same periods also make up the surface assemblages from the immediate surroundings of the compound. The discovery of Chalcolithic sherds in the sondages excavated on the outside of the fortress, west and south of the compound, and the presence of a Seljuk-Ilkhanid site, also on the outside and to the west side of it,⁴³ bear testimony to the existence of prehistoric and Islamic sites in the surroundings of our monument. We may conclude that most of the prehistoric and Islamic sherds from the interior of Qaleh Iraj derive from these sites and found their way into the interior of the fortress in the course of farmers' endeavours to enhance the agricultural potential of the fields within the compound by bringing in soil from the surroundings. The hypothesis gains in strength by the total absence of sherds of prehistoric or Islamic date from the excavated assemblages from the interior of the fortress. We were informed by a peasant that he alone had brought 180 truck-loads of soil as fertiliser from the area just outside into the interior of the fortress.

In 2016 two sondages (Trenches h and i) were excavated in the south-eastern gateway.⁴⁴ Trench h (4.8 m²) was within the gateway and abutted its southern mudbrick walls; Trench i (2 m²) was

⁴³ Mousavinia, *Archaeological Survey*, 49-51.

⁴⁴ There is space here only for the main results; a full excavation report will be published in Sauer et al., *Ancient Arms Race*.

within a side chamber on the north side of the gate. We were able to obtain a total of eleven radiocarbon dates (Figs 25-26, Tables 1-2). Ten of these fall within the Sasanian era. One sample (39h.011) of the early first millennium BC from a, probably construction-related, deposit (h.011) full of broken bricks must be re-deposited and is likely to attest Iron Age activity in the area, perhaps not otherwise represented in excavated assemblages as buried too deeply within the fortress or confined to selected areas. The second-earliest sample (27h.006) dates to c. AD 250-381, but also appears to be re-deposited, embedded in a deposit with broken mudbricks under a cobblestone paving, perhaps a bone embedded in the soil from which the bricks were made. We cannot be sure if it attests settlement or agricultural activity or perhaps that the site was used as a gathering place already before the massive fortifications were built. The remaining nine samples are all a little later. The lowest stratified sample in Trench h (51h.014) dates to c. AD 382-425. It was from a deposit (h.014) containing mudbrick fragments, probably a construction-related levelling deposit, but as it was found c. 36 cm below the base of the gate walls and 2.40 m from their edge, we cannot exclude that it might be earlier than the gate. The deepest stratified sample from a layer abutting the lowest courses of the gate (43h.011) dates to c. AD 394-427. At a similar level, we also found the deepest stratified sample in Trench i (95i.028), dating with almost 90% probability to AD 386-439. None of the samples (all from animal bones) are, of course, directly related to construction, but it seems exceedingly improbable that the sudden burst in bone deposition is all re-deposited material from an earlier unrelated site. We may be confident that we are dealing with the remains of animals consumed, or mounts or beasts of burden used, by those building the fortress and its garrison. The likely construction may thus be dated to between the AD 380s and 420s. It is best not to speculate under which of the kings, in power during this half century, the fortress was built. Qaleh Iraj is likely to be earlier than the advance of the Turks,

maybe Kidarite Huns, onto Rayy under Bahram V (c. AD 420-438),⁴⁵ signifying major strategic significance already then. It is undoubtedly earlier than Peroz's (AD 457-484) urban foundation of Ram Fayruz near Rayy,⁴⁶ not to mention that Qaleh Iraj, largely devoid of permanent structures in the interior, is clearly not a town. The remaining six samples all date to within the fifth and/or first half of the sixth century. This does not necessarily prove site abandonment a century or more before the end of the Sasanian era, merely that no later layers survive within our two small sondages. We hope that future fieldwork will refine the chronology of the fortress's final period of occupation.

We may conclude, that despite the presence of earlier material and the wide chronological range of the surface finds, Qaleh Iraj was probably built, occupied and abandoned in the Sasanian era. Our attribution of the monument to the Sasanian period is corroborated by the artefacts unearthed in the course of our excavations within the fortress, which were of Sasanian date,⁴⁷ and include a number of diagnostic pottery sherds (Figs 27-28), ostraka (Fig. 29) and six bullae, one of them featuring an elephant and one, a pheasant.

V. THE OSTRAKA

By Carlo G. Cereti

⁴⁵ Al-Mas'udi 24 = trans. Barbier de Meynard and Pavet de Courteille, *Maçoudi*, 190; Potts, "Sasanian Iran", 290-91.

⁴⁶ Al-Tabari 1.874 = trans. Bosworth, *The History* V, 112-13.

⁴⁷ Mousavinia, *Archaeological Survey*, 50-56; Mousavinia and Nemati, "Archaeological Survey", 195-99.

The excavations carried out by the team led by Mohammadreza Nemati in the area of the south-eastern gate of Qaleh Iraj (or Qaleh Gabr/ Gabri) brought to light Sasanian bullae and a number of late Sasanian or possibly early Islamic ostraka (Fig. 29) written in Middle Persian.⁴⁸ The ostraka, most probably all of commercial content, are written in a late variant of the Middle Persian cursive script not attested as far as we know, earlier than the late fifth or early sixth century AD.⁴⁹ The ostraka (Qaleh Iraj 1, 2, 3, 4, 7, 8, 9, 10, 11, 12, 13, 14) are written on one or, more rarely, two sides of the pottery sherds and range from ten full lines, all clearly readable, to fragments of barely readable words and will be fully published soon.⁵⁰

VI. A SASANIAN MEGA-FORTRESS ON THE CROSSROADS: PURPOSE, GARRISON SIZE AND HISTORY OF QALEH IRAJ

⁴⁸ On Middle Persian ostraka see among many others, Weber, “Kalligraphie und Kursive” “Pahlavi Papyri und Ostraca” and *Pahlavi Papyri*; for a relatively recent survey of Middle Persian inscriptional literature see Huyse, “Inscriptional Literature”.

⁴⁹ See further Cereti, “Pahlavi cursive script”.

⁵⁰ Cereti, “Ostraka”.

As noted above, a variety of functions have been proposed for the site: a city,⁵¹ a military fortress⁵² or a game park for the royal hunt.⁵³ Our new findings from archaeological excavation, examination of satellite imagery and a re-examination of the historical sources shed significant new light on the monument's function in the Sasanian period. We should re-emphasise that Qaleh Iraj was protected by a massive wall, 15-22 m wide and still surviving to a height of c. 15 m, enforced with 148 densely spaced towers and a row of hundreds of rooms of similar dimensions all around the perimeter. The fortress was also protected by a defensive ditch around the wall. In surface surveys of the interior of the compound, we found a few fired brick and mudbrick fragments as well as two fragmentary stucco decorations. Excavations in this area produced only limited amounts of material from a single occupation horizon in the western quadrant. Satellite images similarly suggest that there were virtually no permanent buildings in the interior. By contrast, the massive wall contained a wealth of interior structures. Not only was there a strong focus on the outer walls, the architects of Qaleh Iraj designed four monumental gates and hundreds of monumental arches evoking royal architecture. Already Kleiss had postulated that the compound had served originally not a purely military, but also a prestige function.⁵⁴ Such features suggest that the monument was built to impress and was erected at a time when the Sasanian army was confident in its military

⁵¹ Farzin, *Documentation Project*, 24-26, 51; Eskandari, "Formal Re-appraisal", 80-81; Pézard and Bondoux, "Mission de Tehran", 61-63 (undecided).

⁵² Dieulafoy, *La Perse*, 142-45; Eastwick, *Journal*, 273-74, 285 (if also implying it was urban); Etemad al-Saltaneh = ed. Navaei, *Etemad al-Saltaneh*, 179-81; Etemad al-Saltaneh, *Tatbiq-e Logat-e Jografiae*, 34; Pirnia, *Tarikh-e Iran-e Bastan* 3, 2217; Matheson, *Persia*, 25; Kleiss, "Qal'eh Gabri"; "Parthische Militärarchitektur"; *Geschichte der Architektur Irans*, 119; Pézard and Bondoux, "Mission de Tehran", 61-63 (undecided).

⁵³ Matheson, *Persia*, 25.

⁵⁴ Kleiss, "Qal'eh Gabri", 292; "Parthische Militärarchitektur", 326.

superiority, perhaps a time of peace in the region when one could afford to include open arches into the walls. Yet, it would be a mistake to conclude that the monument was not defensive. The base of the arches was still six metres above ground level, higher than the crest of many fort walls in antiquity. The massive walls, towers, narrow projecting gates and outer ditch meant that the fortress, hundreds of kilometres behind frontier lines, if well-guarded, would still have been very difficult to storm.

The combined floor space of the c. 828 rooms, of c. 12 m² average size, would probably have added up to c. 10,000 m². If the 148 towers, each of c. 17 m² interior area, were occupied too, another 2,500 m² can be added. Assuming space per occupant was 2-5 m², as has also been estimated for late Roman forts,⁵⁵ the fortress could have accommodated a population of 2,000-5,000 within the rooms embedded in the wall alone, not counting any potential permanent garrison of the towers (perhaps an additional 500-1,250). There is no evidence for a second storey above the rooms, but neither can we exclude the possibility that there was one, potentially doubling floor space and the number of possible occupants.

Why was the vast interior left empty and what function did it serve? Perhaps the numerous rooms within the defensive wall housed a permanent garrison, whilst the open space within was occupied only temporarily. Revealing is a comparison with Sasanian campaign bases in the Gorgan Plain. Magnetometer survey at Qaleh Kharabeh detected neatly aligned double rows of rectangular enclosures, almost certainly for rows of tents. Wide corridors between these rows may have been used to tether horses and provide access.⁵⁶ Whilst tents are hard or impossible to trace

⁵⁵ Gascoü et al., “Deux voyages archéologiques”, 16-19; Gichon, “Estimating the strength”; Priestman et al., *Sasanian Military Investment*; Sauer et al., *Persia's Imperial Power*, 199, with sources.

⁵⁶ Sauer et al., *Persia's Imperial Power*, 312-18, 341-49.

archaeologically, Qaleh Kharabeh may be unusual only in us having been able to find such evidence, whilst the empty interior of Sasanian campaign bases may generally have been filled with tents – as persuasively suggested, for Qaleh Iraj specifically, by Kleiss.⁵⁷ The Armenian historian Elishē attests that the Sasanian army in the fifth century built compounds fortified like cities when on campaign.⁵⁸ Qaleh Iraj was probably the largest of these fortified tent cities. The Persian field army of the north may have gathered here in advance of military missions to the northern frontiers, notably the Gorgan Plain and Transcaucasia, and it may have occupied it in a state of readiness perhaps also in peacetimes. In addition to several compounds of c. 20 ha and 40 ha in size, there is one giant base each west and east of the Caspian Sea: Qaleh Pol Gonbad in the Gorgan Plain and Torpakh Kala south-east of Derbent – both surrounded by massive fortifications around an empty interior of c. 125 ha each. One would not be surprised if their temporary garrisons consisted of, or included, units dispatched from Qaleh Iraj at times of crisis.

Qaleh Iraj and some other Sasanian campaign bases (notably those with corner citadels) are architecturally similar to much earlier squarish fortified compounds in Chorasmia, such as the c. late third-century BC Kazakl'i-Yatkan/Akchakhan-Kala, so much so that there is little doubt that they were modelled after them.⁵⁹ Michelle Negus Cleary has pointed out that these Chorasmian compounds and their Sasanian counterparts have also much in common in the use of space. The large enclosures were designed for temporary tented accommodation, whereas permanent

⁵⁷ Kleiss, *Geschichte der Architektur Irans*, 119.

⁵⁸ Elishē 105 = trans. Thomson, *Elishē*, 157; cf. Sauer et al., *Persia's Imperial Power*, 304, 321.

⁵⁹ Negus Cleary, "Enclosure Sites", 280-88 and Sauer et al., *Persia's Imperial Power*, 372-73 with further references.

buildings and occupation were largely confined to the citadels.⁶⁰ Qaleh Iraj has, of course, no citadel, but the rooms within the massive defensive wall would have provided ample space for a permanent garrison. And, as for the Sasanian campaign bases with corner citadels, there are also prototypes for this type of fortress in Chorasmia, where we find massive fortifications with housing embedded in wide outer walls around a vast and largely empty space in the interior as early as the sixth-fifth/fourth centuries BC. The empty interior is thought to be intended for livestock⁶¹ or, following Henri Paul Francfort's attractive suggestion, for people, troops and provisions in case of a siege.⁶² As other successful empires, the Sasanian state was willing to adopt earlier innovations, and much inspiration for Sasanian defensive architecture came evidently from Central Asia.

The spacing of tents in Qaleh Kharabeh may suggest that 10,000 mounted soldiers could have been comfortably accommodated in 40 ha-compounds, perhaps 30,000 each in Qaleh Pol Gonbad and Torpakh Kala⁶³ and 45,000 at Qaleh Iraj – or perhaps 50,000 if the estimated (permanent?)

⁶⁰ Negus Cleary, "Khorezmian Walled Sites", especially 94; cf. "Walls in the Desert"; "Enclosure Sites", especially 287-88, 301.

⁶¹ Khozhaniyazov, *The Military Architecture*, 21 with no. 45, 71-72, 82, 196-99 figs 4-7, 208 fig. 19; Leriche, "Problèmes de la guerre", 303, 309; Negus Cleary, "Enclosure Sites", 292, 301; Tolstov, *Auf den Spuren*, 102-11, with fig. 21 = Tolstov, *По следам*, 92-101 with fig. 21; Tolstov, *Древний Хорезм*, 79-82; Vogelsang, *The Rise and Organisation*, 290-91. Francfort (*Les fortifications*, 78 no. 114, cf. fig. 5) and Frumkin (*Archaeology*, 89) are more sceptical about permanent occupation within the walls and the emptiness of the interior, but the parallels to Sasanian campaign bases are in any case strikingly close.

⁶² Francfort, *Les fortifications*, 21.

⁶³ Sauer et al., *Persia's Imperial Power*, 347-49, 353-74; "Innovation and Stagnation", 256-58; Lawrence and Wilkinson, "The Northern and Western Borderlands", 110-12; Gadzhiev and Magomedov, "Торпак-Кала". Camps

garrison occupying the rooms within the wall is added. This estimate is similar to the estimated holding capacity of 46,000 men for the inner 184-ha enclosure of the, probably early Sasanian, Hatra siege camp.⁶⁴ An empty interior and heavy fortification is characteristic of all Sasanian campaign bases. Like probably Qaleh Iraj, they may also have held much smaller permanent garrisons. It is possible that in some campaign bases corner citadels, rather than rooms embedded in the outer walls, were intended to house soldiers on permanent guard duty.

Such Sasanian campaign bases may have served multiple purposes that might have included guaranteeing regional security and discouraging or suppressing insurgency. Yet, this is unlikely to be their main purpose, as in the interior and on the southern borders of the Sasanian Empire military compounds were of much smaller size,⁶⁵ and there is nothing to suggest that large fortresses were required to safeguard internal security. More probably, the main function of Qaleh Iraj was to supply military forces for large-scale extra-regional military operations, notably to send them to warzones at the empire's northern frontiers.⁶⁶ The vast compound may conceivably also have been used to train the armed forces or for military assemblies. Worth noting here is Rayy's central strategic significance, lying on one of the major crossroads of northern Persia⁶⁷ – and it is surely

of similar size explored by Simon James at Dura-Europos may also be Sasanian (Sauer et al., “Innovation and Stagnation”, 250-51, with references) and there is a c. 105 ha rectangular walled compound c. 12 km north-east of Bisotun (Kleiss, “Beobachtungen”, 128; “Qal‘eh Gabri”, 301, 306 fig. 20).

⁶⁴ Hauser and Tucker, “The Final Onslaught”, 129.

⁶⁵ Al-Jahwari et al., “Fulayj” and Priestman et al., *Sasanian Military Investment*, with references.

⁶⁶ Sauer et al., “Innovation and Stagnation”, 257-58.

⁶⁷ See also Rante, “The Iranian City of Rayy”; “Ray”; *Rayy*; “The Topography of Rayy”; Minorsky and Bosworth, “Al-Rayy”.

no coincidence that the modern capital of Iran, Tehran, occupies a similar position. Qaleh Iraj was in an ideal position for the headquarters of northern Persia.

And it also may have been a central base for military operations elsewhere. When alluding to the political events under Khosrau II (AD 590-628) and Bahram Chobin, Ferdowsi in his *Shahnama*, insinuates that Rayy had long desired to seize the Iranian throne:

نخست از ری آمد سپاه اندکی که شد با سپاه سکندر یکی
میان را بیستند با رومیان گرفتند ناگاه تخت کیان

First came a small army from Rayy,
And joined that of Iskandar (Alexander).
They prepared themselves along with the Romans,
And suddenly captured the Kiyani throne.⁶⁸

In his discussion of the battle fought between Ardashir I and Aradawan (Artabanus) IV in the Rayy region, Hamdallah Mustawfi remarks that Aradawan (Artabanus) IV staged his last campaign against Ardashir I by raising an army from Rayy.⁶⁹ And when reporting that Kavād I, with the help of Ispahbad Shapur of the House of Mihran, captured and assassinated Sukhra,⁷⁰ the

⁶⁸ Ferdowsi = ed. Gharib, *Ferdowsi*, 1051 = trans. Mohl. *Le livre des rois* VII, 24.

⁶⁹ Mustawfi = ed. Le Strange, *Mustawfi Qazvini*, 104.

⁷⁰ Al-Tabari 1.885 = trans. Bosworth, *The History* V, 131-32 and Payandeh, *Tabari*, 639.

author probably means an army affiliated to this House under the command of Ispahbad Shapur, who was personally involved in the action. We know from historical sources that the House of Mihran was based at Rayy during the Sasanian period, notably under Bahram VI Chobin.⁷¹ Bahram VI Chobin was the marzban at Rayy and a highly successful general from the early 570s⁷² until eventually gaining the throne in AD 590-591 – suggesting that pivotal military forces were stationed near Rayy. Vistham’s power base was also at Rayy.⁷³ The exceptionally long duration of his rebellion, from AD 594/595-600/601,⁷⁴ indicates that he was in control of major military assets. In c. AD 614, a Turkish raid reached Rayy and even Esfahan.⁷⁵ Soon after, in Yazdegerd III’s reign (AD 632–651), al-Tabari alludes to Rayy’s crucial military significance: having been defeated in the Jalula battle, Yazdegerd III retreated to Rayy in the late AD 630s, where he began to recruit an

⁷¹ Dinawari 86-89 = trans. Mahdavi Damghani, *Dinawari*, 113 and Jackson Bonner (<http://www.mrjb.ca/current-projects/abu-hanifah-ahmad-ibn-dawud-al-dinawari>, accessed on June 4, 2018); al-Tabari 1.885 = trans. Bosworth, *The History* V, 131-32 and Payandeh, *Tabari*, 639; Gardizi = ed. Habibi, *Gardizi*, 208; Yaqubi = trans. Ayati, *Yaqubi*, 205-09; Ibn Khaldun = trans. Ayati, *Ibn Khaldun*, 314; Bal’ami, *Tarikh-e Bal’ami*, 675, 1016; Gyselen, *Sasanian Seals*, 38-40; Pourshariati, *Decline and Fall*, 68, 80, 124-30, 189, 206, 248-53, 263-65; 304-05, 409, 438-45.

⁷² Al-Mas’udi 24 = trans. Barbier de Meynard and Pavet de Courteille, *Maçoudi*, 213 and Payandeh, *Al Mas’udi*, 268-69; cf. al-Tabari 1.992 = trans. Bosworth, *The History* V, 301; cf. Jackson Bonner, *Al-Dīnawarī’s Kitāb*, 112-24; Shahbazi, “Bahrām VI Čōbīn”.

⁷³ Sebeos 22 = trans. Thomson, *The Armenian History*, 41-42; *Chronicle of Seert* 65 = trans. Scher, *Histoire nestorienne*, 481-82; Pourshariati, *Decline and Fall*, 132-36.

⁷⁴ Tyler-Smith, *The Coinage Reforms*, 97-98; Jackson Bonner, *Al-Dīnawarī’s Kitāb*, 124-28; Howard-Johnston, *The Armenian History*, 179-81.

⁷⁵ Sebeos 28 = trans. Thomson, *The Armenian History*, 50-51; cf. Howard-Johnston, *The Armenian History*, 184-88.

army to confront the Arabs, who conquered Rayy in the first half of the 640s.⁷⁶ It is in the province of Rayy that the command centre of the whole northern division of the Sasanian army has to be sought.⁷⁷

The sources clearly attest that there were strong military forces in the region in the later Sasanian period, employed in major conflicts. Units based in the Rayy region, at the heart of Greater Iran and on a central communication hub, were ideally positioned for dispatch to major theatres of war, notably in the north-eastern and north-western frontier zones of the kingdom. The garrison stationed here must have been part of the army of the House of Mihran, who backed by such forces even sometimes endeavoured to capture the Sasanian capital. The rebellion of Bahram VI. Chobin of the House of Mihran against Khosrau II and his seizure of Ctesiphon is a telling example of the military power of the House and the troops under its command, who for the most part were probably stationed in the House's home territory – i.e. the Rayy region.

VII. SIZE COMPARISON WITH OTHER MILITARY FORTIFICATIONS

Not only is Qaleh Iraj the largest known walled site across the Tehran Plain, there is, to our knowledge, not a single non-urban ancient or medieval permanent fortification across the entirety of the South-west Asia, Europe or Africa that reaches or exceeds its dimensions. Even the largest

⁷⁶ Al-Tabari 1.2470-71, 1.2473, 1.2634, 1.2647, 1.2650, 1.2653-57, 1.2680-82, 1.2875 = trans. Juynboll, *The History* XIII, 50, 53, Smith, *The History* XIV, 1, 17, 21, 24-27, 51-52 and Humphreys, *The History* XV, 82; cf. Payandeh, *Tabari*, 1748-827; Yaqubi = trans. Wiet, *Ya 'kūbī*, 79; Baladhuri 302, 317-20 = trans. Hitti, *The Origins*, 471 and Murgotten, *The Origins*, 3-8; Minorsky and Bosworth, "Al-Rayy"; Rante "The Topography of Rayy", 164; *Rayy*, 13-14.

⁷⁷ Howard-Johnston, "The Late Sasanian Army", 126, cf. 88 fig. 1, 97 fig. 2; Pourshariati, *Decline and Fall*, 296-97.

camps and fortresses in the Roman Empire, famous for its military, do not much exceed c. 70 or 80 ha in size, whilst most are much smaller (and those built after the third century are almost always well under 10 ha).⁷⁸

And whilst within the Sasanian realm there are other vast military fortifications, the largest we know are c. 125 ha.⁷⁹ We are only aware of one permanent ancient military compound on the globe that is much larger than Qaleh Iraj: a walled compound, c. 4.08 km across (1,665 ha) at Zadiyan c. 32 km north of Balkh in modern Afghanistan. Surrounded by 7 m high mudbrick walls and with a citadel in the centre, it has been argued persuasively that it is military, if dense occupation of this vast area seems unlikely. A radiocarbon sample of straw, from the upper section of the defensive wall, dates to c. AD 222-394, compatible with Sasanian construction (if Kushan origins have been postulated), whilst a wood sample (not certain to be young) from a mudbrick of c. 92 BC-AD 76 from the lower section of the wall could be out of the soil used in making the brick and need not prove that it is earlier.⁸⁰ Leaving this unusual giant fortress at Zadiyan aside, we know of only one military compound of similar size to Qaleh Iraj: the cited, probably early Sasanian, siege camp at

⁷⁸ Bishop, *Handbook*, e.g. 89; Jones, *Roman Camps*, 117-18; see also Kennedy and Riley, *Rome's Desert Frontier* for Roman military installations in the Near East, all of them of significantly smaller dimension.

⁷⁹ Sauer et al., "Innovation and Stagnation", 250-51, 256-58, with sources.

⁸⁰ See La Vaissière et al., "A Kushan military camp" and "Военный лагерь" for this highly important site, arguing that there may also have been agriculture in the interior. (An occupation as dense as postulated for other compounds above would suggest a garrison of over 400,000, which seems highly improbable.) The adjoining oasis wall yielded a date from straw of AD 134-344, perhaps contemporary to the fortress wall, whilst there was still building activity in the central citadel in c. AD 892-1031. We are grateful to Warwick Ball for having drawn our attention to La Vaissière et al., "A Kushan military camp" after we had found and discussed La Vaissière et al., "Военный лагерь" before.

Hatra. Its outer wall enclosed 285 ha, its inner wall, 184 ha. The 101 ha between the two walls were more probably a safety cordon than actually occupied, whilst the inner camp of 184 ha was of similar dimensions to Qaleh Iraj.⁸¹ The Hatra enclosure is less heavily defended and served as a temporary camp rather than as a fortress. Except for the Zadiyan compound, Qaleh Iraj is thus the largest fortress in the premodern world known to us.

VIII. CONCLUSION

With a total area of approximately 175 hectares, Qaleh Iraj is not just one of the major historic sites in the Tehran Plain, but arguably the largest non-urban fortress of the ancient world west of modern Afghanistan. Surrounded by a wall with hundreds of rooms, it may have housed a permanent garrison of 2,000-6,000, whilst the vast interior would have comfortably accommodated 40-50,000 soldiers, their horses and baggage.

It was built probably in the final decades of the fourth century or the first quarter of the fifth century. Recent research suggests that also the 36 ha-campaign at Gabri Qaleh near Gonbad-e Kavus was built between the fourth century the AD 420s.⁸² Both, Qaleh Iraj and Gabri Qaleh, are thus clearly earlier than the Gorgan Wall. At least some Sasanian campaign bases (probably for the mobile field army) were evidently built before the northern frontiers were protected by linear barriers. Perhaps this was a forward-looking security measure, and Qaleh Iraj's open arches, if at an upper level of the wall, certainly suggest that the architects did not anticipate an immediate threat. The Qaleh was nonetheless probably erected in response to northern invaders occasionally penetrating deep into Persian territory. Certainly, further east Hunnic groups increasingly made

⁸¹ Hauser and Tucker, "The Final Onslaught".

⁸² See Sauer et al., *Ancient Arms Race*.

inroads into the Sasanian dominion from the later fourth century onwards⁸³ – perhaps a stimulus for Persia to build up on its northern frontiers, bit by bit, the most massive military infrastructure in the premodern world to the west of China and Central Asia. And it may have been this interlinked network of major fortifications, plus subsequently long walls, with Qaleh Iraj probably forming one of the key hubs, that helped the Empire to contain the north-eastern threat and prosper for another two-and-a half centuries. Pottery, ostraka and bullae provide further evidence that the fortress was occupied, exclusively, in Sasanian times. The wide arches bear the hall-marks of a monumental royal architecture – fitting to the monument’s likely function as a central base and gathering ground for the Sasanian field army of the north.

The radiocarbon samples from our two sondages have failed to produce evidence for occupation in the final hundred years of Sasanian rule. Was the Qaleh already abandoned when Rayy features more prominently than ever before in the sources, in the late sixth to mid-seventh centuries? Yet our sondages were tiny and potential later occupation horizons did perhaps not survive here. Evidence for repeated refurbishment and re-plastering of walls and the discovery of potentially late ostraka make it tempting to think that Qaleh Iraj was occupied for generations or centuries and perhaps into the turbulent final decades of Sasanian rule, even if the vast interior was probably only temporarily and intermittently filled with soldiers’ tents. The ostraka were found within the latest layer of occupation in the centre of the south-eastern gateway. They may well belong to a period after that covered by our series of radiocarbon dates. Was it when the House of Mihran took on the might of the central government in the late sixth century, when the Turkish army invaded in the early seventh century or when Arab forces approached in the 640s that the

⁸³ See, for example recently, Payne, “The Making of Turan” and Alram, *Das Antlitz des Fremden*, 18-77, with sources.

defences were reinforced by filling the interior of the towers, walling-up the arches and inserting arrow-slots? Or did this occur on an earlier occasion, e.g. in the aftermath of the Hephthalite victory of AD 484? It certainly would have made sense for any army under threat, large enough to guard the 5.5 km perimeter, to seek the safety of the tall walls at some of the recorded cataclysmic events to affect the Rayy region, notably once the arches had been walled up and the fortress prepared for siege. Qaleh Iraj may have played a key role in major turning points in history, and it may hold the clues to Sasanian military strategy, employing a network of heavily defended geometric fortifications to keep the north secure. Unquestionably, Qaleh Iraj, more than twice the estimated size of all forts on the Gorgan Wall combined, demonstrates the Sasanian Empire's military capabilities. Its dimensions – covering six times the area of all forts on Hadrian's Wall combined,⁸⁴ more than twice the area of any single Roman fortress and more than ten times that of any late Roman non-urban military base – dwarf its Roman counterparts.

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Mohammadreza Nemati

Iranian Center for Archaeological Research (ICAR)

⁸⁴ Sauer et al., *Persia's Imperial Power*, 231-32 tables 6:7-6:8, with sources.

mohamadreza1973@gmail.com

Mehdi Mousavinia

University of Neyshabur, Department of Archaeology

m.mousavinia@neyshabur.ac.ir

Eberhard W. Sauer

University of Edinburgh, School of History, Classics and Archaeology

eberhard.sauer@ed.ac.uk

Carlo G. Cereti

Sapienza Università di Roma, Dipartimento di Scienze dell'Antichità

carlogiovanni.cereti@uniroma1.it

Table 1: Radiocarbon dates from Trench h⁸⁵

Find & context no.	Sample no.	Sample description	Date	Calibrated date at 95.4% confidence (→ modelled date, taking into account stratigraphy and Bayesian statistics)
24h.003	SUERC-71992	Caprini, left maxilla	1610±18	AD 396-535 → modelled 411-534
27h.003	SUERC-71993	Small ruminant, medial rib	1710±18	AD 250-381 (outlier, re-deposited)

⁸⁵ Trench excavated by Koba Koberidze and Ali Nankali; bones listed in this and the following table were identified by Dr Marjan Mashkour, Homa Fathi and Roya Khazaeli, samples were dated at SUERC, the Bayesian models were compiled using the OxCal programme.

39h.011	SUERC-75254	Large mammal, rib	2765±20	976-838, 85.7%: 945-838 BC (outlier, re-deposited)
43h.011	SUERC-71994	Equidae, right metacarpal	1652±18	AD 345-424 → modelled 394-427
23h.008	SUERC-74174	Small ruminant, long bone	1594±19	AD 414-537 → modelled 407-516
25h.009	SUERC-74175	Small ruminant, long bone	1585±19	AD 420-537 → modelled 401-497, 93.2%: 401-477
51h.014	SUERC-71995	Small ruminant, long bone:	1640±18	AD 348-526, 88.6%: 379-430 → modelled 382-425

Table 2: Radiocarbon dates from Trench i⁸⁶

Find & context no.	Sample no.	Sample description	Date	Calibrated date at 95.4% confidence (→ modelled date, taking into account stratigraphy and Bayesian statistics)
14i.005	SUERC-71996	Caprini, proximal medial rib	1571±18	AD 425-540 → modelled 436-542
19i.005	SUERC-73306	Caprini, rib	1530±18	AD 430-593 → modelled 428-543, 90.3%: 428-495
60i.016	SUERC-72002	Capra, tooth (P4 Inf.)	1565±18	AD 427-542 → modelled 418-535, 94.2%: 418-488
95i.028	SUERC-72003	Caprini, right femur	1628±18	AD 384-533, 79.3%: 384-433 → modelled 386-530, 89.6%: 386-439

Fig. 1. Location of Qaleh Iraj near Varamin (Google Earth).

⁸⁶ Trench excavated by Mehdi Jahed and Przemek Polakiewicz.

Fig. 2. Qaleh Iraj: drone photo, view from the west.

Fig. 3. Qaleh Iraj: Kleiss's plan and reconstruction of the defensive wall (Kleiss 1989: 293 fig. 5), reproduced with the kind permission of the German Archaeological Institute (Dr Judith Thomalsky).

Fig. 4. Qaleh Iraj: reconstruction of the wall (Eskandari 2006: 48).

Fig. 5. Qaleh Iraj: location of the test trenches within the fortress.

Fig. 6. Qaleh Iraj: ceramics from the test trenches within the interior of the fortress.

Fig. 7. Qaleh Iraj: drawings of sherds from the test trenches within the fortress.

Fig. 8. Qaleh Iraj: potential architectural remains in the north-western parts of fortress (ASTER satellite imagery).

Fig. 9. Qaleh Iraj: reconstructed plan.

Fig. 10. Qaleh Iraj: architecture of the defensive wall, consisting of a lower *chineh* and an upper mudbrick section.

Fig. 11. Qaleh Iraj: views of segments of the outer defensive wall (Farzin 2002).

Fig. 12. Qaleh Iraj: reconstruction of the outer façade of the defensive wall.

Fig. 13. Qaleh Iraj: blocked arches in the defensive wall.

Fig. 14. Qaleh Iraj: view and reconstruction of the corridor within the defensive wall.

Fig. 15. Qaleh Iraj: different segments of the defensive wall, view from the interior (Farzin 2002).

Fig. 16. Qaleh Iraj: remains of the rooms within the defensive wall.

Fig. 17. Qaleh Iraj: plan of the defensive wall, including the towers, passageways and rooms, based on excavations in 2017.

Fig. 18. Qaleh Iraj: reconstruction of the defensive wall, including the towers, arches, passageway and rooms.

Fig. 19. remains of a brick platform, abutting the inside of the eastern defensive wall.

Fig. 20. Qaleh Iraj: remains of an arrow-slot of the latest phase.

Fig. 21. The wall in the latest phase.

Fig. 22. Qaleh Iraj: the south-western staircase in the south-east gate, leading up to the main corridor and the rooms within the defensive wall.

Fig. 23. Qaleh Iraj: the north-eastern staircase of the south-east gate, leading up to the main corridor within the defensive wall, on the opposite side.

Fig. 24. Qaleh Iraj: reconstruction of the south-eastern gateway with the two staircases.

Fig. 25. Bayesian model of radiocarbon samples from Trench h.

Fig. 26. Bayesian model of radiocarbon samples from Trench i.

Fig. 27. Qaleh Iraj: ceramics from excavations in the south-eastern gate area.

Fig. 28. Qaleh Iraj: drawings of the ceramics from excavations in the south-eastern gate area.

Fig. 29. Ostraka from the south-eastern gate area.

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