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Evolution of the Sasanian defences of the Gorgan Plain¹

Eberhard W. Sauer, Jebrael Nokandeh and Hamid Omrani Rekavandi

Évolution des défenses sassanides de la plaine de Gorgan

Il n'y a aucune région dans le monde antique qui possède une concentration similaire de fortifications militaires comme la plaine de Gorgan, et c'est aussi ici que nous trouvons la plus longue barrière linéaire renforcée de forts du monde de l'Antiquité tardive. Laissant de côté les forteresses urbaines, l'infrastructure militaire sassanide éclipse celle de l'état romain tardif. Cet article retrace l'évolution de la construction des infrastructures militaires depuis l'émergence soudaine des fortifications géométriques à la fin du IV^e ou au début du V^e siècle jusqu'à leur abandon dans la première moitié du VII^e siècle. La poussée initiale peut avoir été le résultat d'une pression hostile croissante, dans le nord et le nord-est de l'empire, à partir de la fin du IV^e siècle. La construction de fortifications a atteint son apogée au V^e siècle, mais c'est au VI^e siècle que les forts du mur de Gorgan du V^e siècle ont selon toute apparence été occupés le plus densément. Le système a été maintenu jusqu'au VII^e siècle, mais un certain nombre de fortifications dans l'arrière-pays ont vraisemblablement été abandonnées auparavant, et il n'y a pas encore de preuves de la construction de nouvelles installations dans les dernières décennies de la domination sassanide. L'investissement massif a non seulement protégé la plaine de Gorgan, mais a formé l'épine dorsale des défenses sassanides, vitales pour protéger le cœur de l'empire et il a permis à l'empire de lancer des opérations militaires à d'autres frontières.

The densest cluster of fortifications in the ancient world

If one adds up the size of non-urban fortifications in any region of the ancient or late antique world (leaving aside thinly occupied hilltop refuges), there is none to our knowledge that surpasses that of the Gorgan Plain (Fig. 1). The largest of them, Qal'eh Pol Gonbad-e Kavus (Fig. 2), is at 125 ha on its own larger than any fortress designed for a mainly or exclusively military garrison in the Roman world we are aware of. To this we need to add Qal'eh Kharabeh (41 ha) and Gabri Qal'eh (36 ha) dated to the Sasanian era via radiocarbon samples. Qal'eh Gug A (45 ha), Qal'eh Yasaqi (19 ha) and GWS-55 (63 ha) have yielded Sasanian surface finds and share some architectural traits with other Sasanian fortresses. Qal'eh Daland (43 ha) and GWS-92 (63 ha) have not produced any Sasanian finds as yet, but

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their defences bear a striking resemblance to those of certain Sasanian military bases. Several additional geometric bases are known, and there is a high likelihood that some of them are Sasanian as well, but as there is no firm dating evidence and as there are fewer typological parallels to the certain bases, they are excluded to err on the side of caution.² The combined size of the known forts on the Gorgan Wall is c. 80 ha intramural space. Even if one excludes the Tammisheh Wall, at the western edge of the plain and perhaps at the provincial boundary at the time, and all geometric fortifications of unknown date, the size of certain or likely Sasanian fortifications adds up to c. 515 ha, a figure which does not include the walls and substantial moats enclosing them.

We have admittedly made no attempt to compile and add up the size of forts in other parts of the ancient and late antique world – a task that could take a very long time. If we consider, however, that in the late Roman state few military installations exceed a size of 5 ha, and the vast majority were no larger than a fraction of a hectare,³ there is little doubt that the combined size of military bases in no late antique Roman province comes anywhere near this figure. Even in the early to high imperial era, a typical legionary fortress covered 15-25 ha,⁴ and there were not normally more than a maximum of four legions in any one province; auxiliary forces roughly matched legionaries in numbers and, whilst the size of forts for units of similar strength could vary substantially, the average space required per auxiliary soldier will not have differed greatly from legionaries. Within the Sasanian Empire, we find geometric fortresses also elsewhere, notably in Upper Mesopotamia and Transcaucasia, but in smaller numbers, perhaps as more troops sheltered within the walls of urban fortresses. Future survey may reveal many more Sasanian fortresses across the vast empire. It is possible that cultivation and more recent settlement may have erased or obscured a higher proportion of fortresses in the fertile landscapes in Mesopotamia than at the edge of the steppe, but it is also worth noting that much of the Gorgan Plain is fertile and densely occupied. In more arid marginal lands, furthermore, there were no towns available to provide safe shelters to field armies, so a higher concentration of geometric fortresses may not just reflect modern preservation and detectability but an ancient reality. All in all, it seems likely to us that future survey will increase the number of known Sasanian fortresses in various frontier territories of this vast empire, but that the Gorgan Plain will maintain its lead. Admittedly, only the forts on the Gorgan Wall contain barracks, whereas the large fortresses in the hinterland were largely empty and designed to house giant tent cities. The permanent garrison on the Gorgan Plain may have been no greater than that of some of the most vulnerable frontiers zones elsewhere in the Sasanian and Roman worlds, but the efforts in creating from scratch safe bases for the deployment of large troop numbers exceeded those in any other region. Why was there such a concentration of entrenchment efforts focused on a plain of no more than c. 150 km west-east extent?

The sudden emergence of geometric fortifications

² Hopper *et alii* 2022; Sauer *et alii* 2013, pp. 303-381; 2022, pp. 287-355; Wilkinson *et alii* 2013, pp. 81-98.

³ E.g. Gregory 1997; Johnson 1983.

⁴ E.g. Bishop 2012.

Just as intriguing as the dimensions of the defences is their chronology. Based on our excavations and the radiocarbon dates from two forts on the Gorgan Wall (2 and 4), the canal next to Fort 9, one fort near the Tammisheh Wall (the Bansaran Fort), two kilns on the former and one on latter wall, three large fortresses in the hinterland (Qal'eh Pol Gonbad-e Kavus, Qal'eh Kharabeh and Gabri Qal'eh) and one smaller fort (Buraq Tappeh), none appears to have been constructed before the mid-fourth century at the very earliest, and it is possible that none is earlier than the early fifth century. And it is likely that the construction of none postdates the sixth century. It is even possible that all forts dated so far were constructed in the fifth century, although it seems more probable that the building programme extended into, or was resumed in, the sixth century.

Irrespective of the date of construction, there is evidence for heavy occupation of the partially excavated forts (2 and 4) on the Gorgan Wall in the sixth century. Fort 4 was certainly still occupied in the first half of the seventh century, and the same is likely to be true for other forts on the wall. Whilst the number of relevant scientifically dated sites on the Gorgan Plain is small, architectural similarities with undated sites suggests that their chronology is likely to be representative for the majority of geometric fortifications in the area. We certainly know of no secure evidence to attribute any of the geometric fortifications in the area to the Parthian or early Sasanian era. Some older radiocarbon dates are, however, also available for the small hinterland bastion of Tureng Tappeh. They do not permit precision-dating, but the excavators have tentatively assigned the construction of the fort to the second half of the third century, and it certainly remained occupied into the late Sasanian era and beyond.⁵ Tureng Tappeh was a small non-geometric fort on a hilltop. It need not be a precursor of the larger lowland forts, which only appear to have emerged in the later fourth or early fifth century. What triggered the sudden surge in defensive efforts a century and a half after the Sasanian dynasty had risen to power?

This article complements our other recent work on the Sasanian defences of the Gorgan Plain.⁶ There is no space to present the evidence in similar detail, and there is inevitably some overlap. We hope that it will bring the Sasanian fortifications on the Gorgan Plain, as a case study for the military capabilities of Sasanian Persia, to the attention of scholars specialising in the late antique world more broadly. In contrast to our cited monographs, whose structure is typological, we do not focus in this paper on the classification of sites into different categories of fortifications and other monuments. Instead, we attempt to present the evolution of the Sasanian defences of the Gorgan Plain over time, in so far as our often not very precise dates allow us to present monuments in a chronological sequence. Our focus on the relative and absolute chronology of the building programme sheds new light on the historical context of the massive investment in military infrastructure, unparalleled in the late antique world.

Table: dated Sasanian installations on the Gorgan Plain, including the Tammisheh Wall at its western edge. Dates in regular font are unmodelled and calibrated via the 2020 OxCal

⁵ Boucharlat, Lecomte 1987, especially pp. 44, 194.

⁶ Sauer *et alii* 2013; 2022.

programme. The earliest date is defined as that with the earliest *terminus post quem* (at 95.4% probability), and the latest date is defined as that with the latest *terminus ante quem* (at 95.4% probability), irrespective of their position in the stratigraphy and the BP ('before present') date. At Gabri Qal'eh where the two samples are of almost identical age, the one deeper in the stratigraphy and with the higher BP age is listed first. **Where available, modelled dates are added (in bold font). These are the earliest and latest dates, taking into account stratigraphy and Bayesian statistics (and are not always from the same samples as the earliest and latest unmodelled dates). They are likely to be more accurate.** *Where there is a high probability of a date falling into a narrower bracket, this is indicated too in italics (for the unmodelled date, where no modelled date is available, and for the modelled date, if both are available).* Only unmodelled dates at 95.4% probability are listed for post-Sasanian occupation.

Site	No. of Sasanian-era radiocarbon dates	Earliest date (95.4% probability plus most likely date range where applicable)	Latest date (95.4% probability plus most likely date range where applicable)	Evidence for post-Sasanian occupation
Military				
Gabri Qal'eh	2	AD 261-528 (1663±22 BP) AD 261-529 <i>88.9%:</i> AD 337-440	AD 258-535 (1662±30 BP) AD 261-528 <i>94.0%:</i> AD 347-433	3 dates: AD 1264-1387 (707±30 BP) - AD 1292-1398 (631±30 BP)
Qal'eh Kharabeh	4	AD 417-544 (1599±29 BP) AD 416-527	AD 419-545 (1593±28 BP) AD 434-547	n/a
Buraq Tappeh	6	AD 405-542 (or later; not certain to be young material) (1623±29 BP) AD 409-538 (or later; not certain to be young material)	AD 440-597 (1533±18 BP) AD 441-586 <i>80.0%:</i> AD 531-586	n/a
Tammisheh Wall kiln	1	AD 416-541 (1608±27 BP)		n/a
Gorgan Wall kiln W of Fort 30	2	AD 376-539 (1637±27 BP) AD 394-540	AD 430-573 (1558±27 BP) AD 427-565	n/a
Gorgan Wall kiln E of Fort -4	2	AD 420-550 (1585±29 BP) AD 424-555	AD 433-591 (1545±26 BP) AD 433-577	n/a
Alluvial deposit next to the Gorgan Wall	1	AD 426-567 (1566±29 BP)		n/a

bridge across the Sari Su Valley W of Fort 2				
Gorgan Wall Fort 2	19	AD 423-539 (1597±18 BP) AD 430-535	AD 578-646 (1456±21 BP) AD 561-636	n/a
Gorgan Wall Fort 4	12	AD 424-550 (1579±25 BP)	AD 605-671 (1384±25 BP)	n/a
Gorgan Wall canal at Fort 9	1	AD 439-636 (1517±27 BP) 86.0%: <i>AD 533-607</i>		n/a
Bansaran Fort near Tammisheh Wall	3	AD 433-588 (1547±26 BP) AD 437-574 87.3%: AD 474-576	AD 444-641 (1507±28 BP) AD 485-632 94.6%: AD 536-609	n/a
Qal'eh Pol Gonbad-e Kavus	1	AD 435-605 (1525±29 BP) 75.7%: <i>AD 528-605</i>		2 dates: AD 893-1027 (1069±31 BP) & AD 1161-1266 (843±29 BP)
Alluvial deposits that are probably associated with a Sasanian reservoir/watery barrier in the Sari Su Valley W of Fort 2	4	AD 439-639 (1513±29 BP) 84.2%: <i>AD 533-610</i>	AD 562-648 (1465±30 BP) AD 561-640	n/a
Urban, perhaps with a smaller military garrison guarding the walls				
Dasht Qal'eh	5	AD 418-540 (1602±22 BP) AD 433-543	AD 541-641 (1499±27 BP) AD 537-607	n/a

Late fourth/fifth-century campaign bases

The site that has yielded the earliest radiocarbon dates so far is Gabri Qal'eh, a heavily defended fortress of 36 ha interior area (Fig. 3). Two bones, both from within the access causeway across the moat, have produced almost identical dates. Whilst in theory they could be as early as the later third or as late as the early sixth century, modelling suggests a date between the 340s and 430s. The causeway also contained Sasanian pottery and appears to have been created using redeposited material from an earlier phase of occupation. As there was also Sasanian pottery from the surface within the Qal'eh and as its plan boasts some striking similarities to other campaign bases, we may be certain that the Sasanian material belongs to an early occupation of the site. It would be an extraordinary coincidence if the fortress overlay Sasanian rural settlement of such vast extent to account for the presence of Sasanian material in the causeway and the fortress itself. Both radiocarbon dates are earlier (both in terms of BP/before present dates and the earliest like *termini post quos*) than any of the 34 samples from the forts associated with the Gorgan and Tammishe Walls. It seems

likely that it was built before the Gorgan Wall, and it is certain that its earliest occupation dates to a time before that of the forts on these massive linear barriers.

Qal'eh Gabri is of strikingly similar plan to three other fortresses on the Gorgan Plain: Qal'eh Gug A, Qal'eh Kharabeh (Fig. 4) and Qal'eh Daland. All four were, more or less, square, measured c. 600-665 m across and were surrounded by walls with regularly-spaced towers. They were probably also all provided with a moat, although there are only faint traces at Qal'eh Gug A. Qal'eh Kharabeh and Qal'eh Daland were divided into four quadrants via central causeways between their four gates. Qal'eh Gabri was divided into two symmetrical halves by a prominent central causeway and, quite possibly, these two halves had once also been subdivided; there is in any case a central gate on the north-east side, though there are no traces of any gate on the south-west side. Little is known about the internal division of poorly preserved Qal'eh Gug A. All, except for Qal'eh Daland, have a corner citadel, perhaps intended for a permanent garrison and/or as the command centre. These parallels are striking and suggest that there was central planning and coordination of defensive matters. That there were some variations should not come as a surprise. Topography and settlement mounds could influence the layout. At Qal'eh Gug A, an existing mound was reused as a corner citadel. This not only saved labour, but also ensured that no high ground was located just outside the walls or in the interior; the former would have weakened the defences, the latter would have meant that fewer tents could have been pitched in uneven terrain.

Whilst these four massive fortresses probably all belong to a similar era and architectural tradition (inspired by earlier Central Asian compounds⁷), they do not appear to be all of identical date. The four radiocarbon samples from Qal'eh Kharabeh, whilst overlapping with those of Gabri Qal'eh and those from the Gorgan Wall forts, are on average consistently later than the former and mostly earlier than the latter. We may assume that they represent a sequence: Gabri Qal'eh may have been built first, perhaps in the later fourth or at the beginning of the fifth century, followed by Qal'eh Kharabeh maybe at some stage in the first half of the fifth century and the fort-lined Gorgan Wall a little later still within the fifth century. It is also possible that Qal'eh Kharabeh was occupied whilst the Gorgan Wall was under construction and that its garrison may have helped to oversee and secure this venture in the west of the Gorgan Plain. Interestingly, Qal'eh Kharabeh differs from Gabri Qal'eh not only in its likely date of construction, but also in architecture. It boasts strongly projecting gates, flanked by narrowly spaced gate towers. By contrast, Gabri Qal'eh's gate towers do not appear to be of greater dimensions than its interval towers, and they are spaced just as far apart. The towers of the Gorgan Wall forts have more in common with those of Qal'eh Kharabeh. It seems that gate design was improved over time, with the aim of facilitating effective defence of these vulnerable entrance points.

At Qal'eh Kharabeh, geophysical and aerial surveys have established that there were numerous rectangular enclosures in parallel double-rows. They almost certainly marked the

⁷ Nemati *et alii* 2020, pp. 214-215.

position of tents. The wide straight access corridors would have facilitated rapid troop movement when required and would have provided space to tether horses near the soldiers' tents. These enclosures have been detected only in the compound's eastern half. It is unknown why they were dug: perhaps to facilitate drainage, perhaps to make the tents more wind-resistant by covering the canvass with soil or perhaps to ensure that each group of soldiers pitched their communal tent at precisely the right spot. It is odd that there were none in the western half. But it is perhaps even more peculiar that they were dug at all, as we are not aware of any parallels for tent enclosure ditches, neither from the little-known Sasanian campaign bases, nor from the much more extensively studied Roman marching camps.⁸ Traditions could, of course, have differed between the Roman army of the early to high imperial era and the later Sasanian military, but it is safe to conclude that tents did not normally require enclosure ditches. There are, however, also no other obvious functions that can explain the neatly aligned geometric enclosure ditches. They did not surround any tree holes, nor could the steppe climate have sustained a tree plantation, and whilst there are canals, there is no evidence that water was channelled to the enclosures. No strong defences furthermore would have been needed for a park, and Qal'eh Kharabeh's remote position in marginal land rule out an interpretation as a royal leisure facility. We may be confident that the heavily defended compound, with nothing other than numerous enclosures of similar shape and size, plus small mud-brick supply facilities lined up along the causeways, was a military fortification designed for temporary occupation only, but capable to withstand an assault by a major army. Even though there is no evidence for enclosure ditches in the western half, it also makes no sense to assume that Qal'eh Kharabeh's strong defences were designed for a half-empty interior. Perhaps the enclosure ditches date to a time when the compound was reoccupied by a unit of half the strength it had been designed for.

Qal'eh Kharabeh is unique in having yielded likely evidence for the arrangement of tents, but almost certainly far from unique in being a giant tent city. All the compounds under discussion boast heavy defences around an entirely or largely empty interior. They are no towns, as there are no traces of permanent housing or public buildings in the interior. Such traces cannot have vanished, as all permanent structures would have employed mud-brick or rammed earth. Once abandoned, the ubiquitous material would not have been worth robbing. The absence of collapse mounds or substantial occupation deposits in the interior of these Sasanian fortresses, with the exception of Gabri Qal'eh which was transformed into a town later, suggests that they all served as well-defended campaign bases where most occupants dwelled in temporary accommodation.

There are a number of other fortresses that are almost certainly also Sasanian, but they differ more in plan and/or size: above-cited Qal'eh Yasaqi is only half the size and more irregular in plan; Tammisheh, a town with a corner citadel that may have been of military origins, is also only half the size of the above sites. GWS-92, discovered by Kristen Hopper and the landscape team, is oblong in plan, but boasts the typical moat and towered walls, as well as possible causeways. It is also much larger (c. one-and-a-half times the size of any one of the four listed square compounds), and it has no citadel. GWS-55 is of broadly similar size, but

⁸ Jones 2012.

differed in plan (it was a parallelogram) and the position and size of its citadels (three, two large ones in opposite corners and one of similar size to that at Qal'eh Kharabeh near the centre). It is worth noting that amongst unexcavated compounds with well-documented towered walls (Qal'eh Daland, Qal'eh Gug A and GWS-92), none appears to have the strongly projecting narrow gates similar to those of Qal'eh Kharabeh, perhaps suggesting that they are of similar architecture (and potentially date) to Gabri Qal'eh, although this is far from certain.⁹

It is not hard to establish the reason why the earliest geometric fortresses are earlier than the Gorgan Wall. Building the moat-enclosed fortress of Gabri Qal'eh with walls of some two-and-a-half kilometres length and an estimated volume of over 180 m³ per metre, reinforced with 91 towers and a citadel, was no mean task, but arguably much more manageable than erecting a border wall of over 170 km length and with more than 30 associated forts and the barracks inside, not to mention the long canals and thousands of brick kilns needed. The most probable reason for the construction of Gabri Qal'eh and other fortresses of similar design was a substantial external threat, and it coincides with increasing enemy pressure on the empire's northern and north-eastern frontiers.¹⁰ The troops deployed to the Gorgan Plain required safe bases that enabled them to resist attack, keep provisions secure and launch counter-offensives.

A fifth-century chain of forts along the Old Gorgan River

Wide moats and tall towered walls would have made it very difficult for a hostile force, notably if unfamiliar with siege warfare, to storm any of these fortresses and especially so when fully occupied by members of the Sasanian field army. Yet a small number of strong bases would have been less effective in protecting a large area against low-level threats, such as small mounted raiding parties, than a much wider network of strongholds. Furthermore, if we are right in thinking that the giant tent cities were occupied by mobile units of the field army at times of crisis only, with no more than a caretaker garrison left behind otherwise, campaign bases would have been of little use in ensuring the safety and security of the population and economic assets of the Gorgan Plain on a permanent basis. It is therefore no surprise that, probably around the same time as more and more large campaigns were built in preparation for defence against large-scale invasion, we also see the emergence of small forts. These were designed to be small enough for permanent occupation. For this reason, they contained mud-brick housing. As the contingents occupying them were much smaller, defensibility was paramount, and it is unsurprising that they are also protected by strong towered walls and substantial moats or, in the case of the hilltop fort of Tureng Tappeh, by steep slopes on all sides. In contrast to the massive campaign bases, most of which cluster in fertile lands that could have provided their large garrisons with food (and not all of them will have been occupied at once), the small forts were furthermore easier to maintain in marginal

⁹ Bivar, Fehérvári 1966; Hopper *et alii* 2022; Kiani 1982; Sauer *et alii* 2013, pp. 303-381; 2022, pp. 287-355; Wilkinson *et alii* 2013, pp. 81-98.

¹⁰ E.g. Rezakhani 2017, pp. 85-103.

land than giant fortresses. Only a chain of small forts could secure the northern approaches to the plain.

Small strongholds are, however, also more difficult to detect and date and more likely to have been erased by later development. It is likely therefore that we know a lower proportion of them than of the much larger campaign bases. There is no doubt that there will be substantial gaps in our knowledge of Sasanian forts, but even the few we know seem to form a clear network. Several of them are lined up along the Old Gorgan River. They include Ahmad Khan and Musa Khan as well as the fort of Buraq Tappeh (Fig. 5). The meandering river would not have formed an easy line to control, but was reportedly dangerous to cross in the past,¹¹ and the cited forts may have guarded bridges or fords. Some of those we know are less than a day's march apart, may have potentially offered safe night-shelter for officials and their garrisons could have patrolled the hinterland. Buraq Tappeh boasted a large caravanserai-style courtyard where there would have been space for accommodating camels and horses. The depression in the centre of Ahmad Khan suggests that here too there were accommodation units lining the fort walls and a courtyard in the centre.¹² Tureng Tappeh in the hinterland suggests that the system was multi-layered and not confined to a string of forts along the Old Gorgan River.

The radiocarbon dates from Buraq Tappeh, as is typical for the era, overlap with those of Gabri Qal'eh as well as with those of the Gorgan Wall forts. The average dates of those from the lower levels, however, are later than those from Gabri Qal'eh and probably earlier than those from the Gorgan Wall forts. Maria Daghmehchi's research suggests that some of the pottery is also earlier than that from the forts on the wall.¹³ We may thus propose that Buraq Tappeh was built some time between the early and mid-fifth century, probably a few decades before the Gorgan Wall – and perhaps this applies to the other forts of the riverine control line as well.

The fifth-century Gorgan Wall

Yet, the interval between the establishment of the chain of forts along the river bank and its replacement by a linear barrier was probably not very long, perhaps a generation or two. And Buraq Tappeh does not appear to have been instantly abandoned once the Great Wall was completed, but appears to have been occupied for some time beyond. Occupation density, however, fluctuated greatly and unsurprisingly so, bearing in mind that it was now in a hinterland position. The Gorgan Wall formed a much more formidable and impermeable barrier than the network of forts had done before. There were no prototypes for linear barriers on the Gorgan Plain, although it is possible that the extensive Iron Age canals¹⁴ could also have been used as defensive barriers. James Howard-Johnston has made a persuasive case

¹¹ Mustawfi 18, trans. Le Strange 1919, p. 206.

¹² Abbasi 2016, pp. 189-195; Sauer *et alii* 2022, pp. 249-286.

¹³ Daghmehchi *et alii* 2022, pp. 534-539.

¹⁴ Wilkinson *et alii* 2013, pp. 43-58.

that rivers and canals were used as effective defences for Mesopotamia,¹⁵ and whilst the canals on the Gorgan Plain and the Gorgan River would not have matched their counterparts in Mesopotamia in width or water flow, they could have been used as defensive barriers to slow down hostile forces, if mobile forces were available to man their banks once there was news of impending danger.

It is even possible that a section of an earlier (Iron Age?) canal may have been cleared out and reused as canal along a section of the Gorgan Wall. Excavations of the canal at Fort 9 (Fig. 6) yielded a piece of Iron Age pottery from below the base of the canal, potentially suggesting that there had been an earlier and deeper canal here in the Iron Age.¹⁶ More research, however, is needed to prove or disprove this hypothesis. If a section of an Iron Age canal was reused in the Fort 9 area – and the case is far from proven – this would have speeded up construction works. And it might add strength to the hypothesis that, in addition to long walls further afield – local Iron Age canals, useful for irrigation of marginal land and as watery barriers, may have inspired the Gorgan Wall.

Whether all of the canals leading to and along the Gorgan Wall were dug from scratch in the fifth century or whether sections follow earlier Iron Age canals, the efforts involved in building the Great Wall were immense. Brick kilns were found all along the wall (Fig. 7), spaced as little as c. 37 m apart near Fort 30,¹⁷ but at somewhat greater distances (of at least up to 86 m) elsewhere.¹⁸ If we assume an average of 37 m, there would have been at least c. 5,000 on the Gorgan and Tammisheh Walls combined, but even if the average should have been 86 m, there would have been at least 2,000. Where it crosses the Sari Su River, the Gorgan Wall survives to a height of c. 7.50 m (Fig. 8), despite its upper section having been destroyed through collapse and brick robbing.¹⁹ It would have been much higher at this point in antiquity. Of course, a bridged crossing of a valley may have exceeded the wall elsewhere in height, but it demonstrates the extraordinary efforts to plug a weak point in the system. It is inconceivable that so much effort would have been invested in securing a river crossing, if the wall elsewhere would have been easy to overcome. Furthermore, the lowland section of the broadly contemporary Ghilghilchay Wall, made of mud-bricks not worth robbing, survives to a height of seven metres in places (Fig. 9), one of the towers even to a height of ten metres,²⁰ and it is hard to imagine that its height would not have been well in excess of the height of its modern ruined remains prior to disintegration of the mud-bricks. The Gorgan Wall, built of more durable fired bricks and supported by a substantial soil bank, could have risen to a similar height.

Upgrading the defences in the sixth century

¹⁵ Howard-Johnston 1995, pp. 188-191.

¹⁶ Sauer *et alii* 2013, pp. 163-173.

¹⁷ Sauer *et alii* 2013, pp. 143-149.

¹⁸ Sauer *et alii* 2013, pp. 149-154, cf. 244-250; 2022, pp. 27-33.

¹⁹ Sauer *et alii* 2022, pp. 27-74.

²⁰ Aliev *et alii* 2006.

By far the largest fortress on the Gorgan Plain (excluding urban fortifications) is Qal'eh Pol Gonbad-e Kavus, which covers some 125 ha and could comfortably have sheltered some 30,000 horsemen.²¹ There is an over 3 in 4 probability that it was erected at some stage between the late AD 520s and the very beginning of the seventh century, judged by charcoal sealed under its wall. It is possible that it formed the main base of the field army operating on the Gorgan Plain under Khusro I or his successors and perhaps replaced some of the earlier campaign bases. Its interior area was similar to that of three of the c. 40 ha large bases described above. Perhaps these were no longer in a good state of repair or perhaps there were strategic or psychological reasons to keep such a large force in a single base. We should emphasise that our single radiocarbon date (not counting those from medieval deposits within the, repeatedly cleaned-out, moat surrounding the base) could also be as early as the last two thirds of the fifth or the early sixth century. An attribution to the mid or late sixth century, however, seems more likely, not only as there is a higher probability that the sample belongs to this era, but also as it is hard to imagine that all campaign bases on the Gorgan Plain, with a holding capacity of over 100,000 men combined (not counting the numerous undated fortifications), would have been required simultaneously.

Whilst Qal'eh Pol Gonbad's tentative attribution to the 520s-600s seems likely, we are on firmer ground in dating a further installation to the sixth century. Four samples from a deep alluvial sequence in the Sari Su River Valley are probably no earlier than the middle third of the sixth century. They suggest that around this time the river was dammed. The large reservoir could have served multiple purposes, but one of them was probably to create a deep water pool at the point where the Gorgan Wall crossed the river. This would have made it very difficult for hostile forces to approach or cross the barrier at this point and would furthermore have protected the bridged river crossing from erosion.

The two forts on the Gorgan Wall we excavated, Forts 2 and 4, were both heavily occupied in the sixth century, to judge by the finds we unearthed as well as the multiple ovens, storage pits and provisions in large storage jars available to the garrison. The two c. 90 m long (double-storey?) barracks in Fort 2 had at this stage been widened to almost 30 m through (single-storey) annexes on both sides (Fig. 10). No coins were found, and the garrison does not appear to have received monetary stipends. In the sixth century fort occupants produced their own textiles and may have been largely self-sufficient and not expensive for the state to maintain.

Final defensive efforts in the seventh century and the afterlife of the Gorgan Wall

There is as yet no fort or fortress whose construction can be assigned to the seventh century. Few, of course, have been dated, and it is perfectly possible that future fieldwork may reveal that the system continued to be upgraded. The evidence available so far, however, suggests that the systematic build-up of military infrastructure on the Gorgan Plain started in the later fourth or at the very beginning of the fifth century, probably as a result of increasing hostile

²¹ Sauer *et alii* 2013, pp. 358-360, 369-371; 2022, pp. 287-325.

pressure from the north and north-east. The entrenchment efforts reached their apogee in the fifth century and continued probably at least until the mid-sixth century. The hinterland fort of Buraq Tappeh does not appear to have been occupied beyond the mid or late sixth century, and it seems possible that some other forts in the hinterland of the Gorgan Wall were abandoned too. It is more difficult to tell how often and how intensively the campaign bases were occupied. The remarkable similarity of our four samples from Qal‘eh Kharabeh suggests perhaps that the main activity can be assigned to around the (early to mid?) fifth century with no clear evidence for much later reoccupation. Gabri Qal‘eh in more fertile surroundings, by contrast, was transformed into a town and occupied for about a millennium. It is possible that it was occupied more intensively. At least parts of the Gorgan Wall were maintained into the first half of the seventh century, and large storage pits in Fort 4 remained in use until this time. We do not know the exact date when the Gorgan Wall forts were abandoned, nor do we know if they were all evacuated at once or successively. We have firm evidence for seventh-century occupation from Fort 4 (Fig. 11), but none so far from smaller Fort 2, where the last traceable activity could be as early as the AD 560s or 570s or as late as the 630s or 640s. It seems likely that at least some forts on all sections of the wall remained partially or fully occupied until the last decades of Sasanian rule, as the wall would have served no purpose unless there were guardians on duty on all sections. Furthermore, without keeping the north secure, it is hard to imagine that the Sasanian Empire, confronted with a powerful Romano-Turkish alliance, would have succeeded in conquering the Levant in the AD 610s-620s.

The heavy investment in the Gorgan Plain probably served a number of purposes:

- To protect the prosperous lands to the south of the wall, which in turn produced the food that enabled the empire to station a sizeable garrison of soldiers here plus large field armies whenever required.
- To prevent enemies from crossing the Alborz and from reaching the empire’s heartlands.
- To make it difficult or impossible to make permanent inroads. Lengthy siege operations would have been required to enable even a strong hostile force to capture the numerous strongholds, whilst any advance into the empire’s inner territories with unconquered fortresses in the rear would have been very risky.

The defences of the Gorgan Plain were a pivotal part of a much more extensive fortification belt that extended much further to the east and west – the backbone of Sasanian defences that kept the north as well as the interior secure in the fifth, sixth and early seventh century. It skilfully plugged the gaps in natural mountain chains, large bodies of water and arid lands with linear long walls, gorge-blocking barriers, canals, chains and networks of fortifications and fortified oases. Stretching from Central Asia to the Central Caucasus and temporarily perhaps even to the Black Sea,²² it may have inspired a report in the *Shahrestaniha-ye*

²² Azarnouche 2022; Sauer *et alii* 2013, pp. 14-15; 2020, pp. 883-892.

Eranshahr of a wall 180 farsangs, i.e. about a thousand kilometres long,²³ and of a legendary great wall in Ferdowsi's *Shahnama*.²⁴

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Illustrations

[Please reproduce Fig. 2 at the same size as the image, i.e. c. 216.6 x 154.6 mm; the 1000 m scale should be 100 mm long; it will need to be rotated. For Fig. 10, we also recommend reproduction at image size; the 100 m scale should ideally be 50 mm long. For all other images, we recommend publication at page width. All images may be reproduced black and white, but feel free to publish some in colour.]

Fig. 1 – Map of the Gorgan Plain with Sasanian-era military installations and those of unknown date (based on the results of our joint project, including those of the landscape team, led by Kristen Hopper, Hamid Omrani Rekavandi and the late Tony Wilkinson).

Fig. 2 – Selection of Sasanian-era geometric forts and fortresses on the Gorgan Plain in arbitrary orientation, but all on the same scale. All sites were surrounded by substantial moats which have not been plotted here. The plan of Buraq Tappeh is based on geophysical survey and one small trench and the exact extent of buildings is approximate only. The reconstructed plan of Qal'eh Kharabeh shows the enclosures (probably marking the position of tents) in the interior. Tented accommodation is likely to have once covered all of the interior, but is only proven for the eastern half and hence only plotted here in the east (on the right). Note that it is likely that there were annexes to the original barracks not only in Fort 2, but also in Fort 4 and that the buildings in Fort 4 were thus probably of similar width to those in Fort 2; the proportion of the intramural area in Fort 4 covered with buildings was probably even substantially larger than the plan implies. It is as yet unknown whether or not there were also rooms lining the inside of the fort walls in the Gorgan Wall forts. If so, the forts were even more densely occupied. Excavations will be required to prove or disprove their existence. Qal'eh Pol Gonbad-e Kavus probably once had four gates, but only those securely identified have been plotted. The towers on its walls are not plotted, as they probably belong to a medieval restoration.

²³ Azarnouche 2015, p. 237; Canepa 2018, p. 358; Sauer *et alii* 2022, pp. 768-770; *Shahrestaniha-ye Eranshahr* 20, trans. Azarnouche 2015, p. 249; Daryaei 2002, pp. 18, 41.

²⁴ Ferdowsi, *Shahnama* C.1630, ed. and trans. Mohl 1868, pp. 186-187; Warner and Warner 1912, pp. 163-165; cf. Jackson Bonner 2011, p. 38.

Fig. 3 – Drone image of Gabri Qal‘eh, with its western corner in the foreground and the Alborz Mountains in the background, by Davit Naskidashvili and the joint project.

Fig. 4 – Drone image of Qal‘eh Kharabeh, with its strongly projecting north gate in the foreground, by Davit Naskidashvili and the joint project.

Fig. 5 – Buraq Tappeh, a small Sasanian fort on a now dried-up old course of the Gorgan River. The car is parked to the south of the fort platform.

Fig. 6 – Drone image of Fort 9 (left) on the canal-lined Gorgan Wall (right) by Davit Naskidashvili and the joint project.

Fig. 7 – A brick kiln (middle ground, right) near the Gorgan Wall (foreground, left) to the east of Fort -4, not far from the wall’s mountainous terminal in the east.

Fig. 8 – The Gorgan Wall crossing the Sari Su River on a now only partially preserved bridge.

Fig. 9 – The lowland section of the Ghilghilchay Wall west of the Caspian Sea (looking east towards the sea). Even the decayed remains of the mud-brick barrier show that Sasanian walls could reach substantial height.

Fig. 10 – Plan of Fort 2 with its two barracks.

Fig. 11 – Drone image of Fort 4 (middle ground) on the canal-lined Gorgan Wall (foreground, left to centre) by Davit Naskidashvili and the joint project. Excavations have proven that it remained occupied into the seventh century.

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