Sasanian Archaeology

Settlements, Environment and Material Culture

Edited by

St John Simpson

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Cover: Archaeological excavations and environmental sampling underway in Erk-Kala, the Sasanian citadel of ancient Merv, modern Turkmenistan (photograph: St J. Simpson, 1992).
The first sherd of Sasanian pottery to be published is from Layard's 19th century excavations on the mound of Kuyunjik at Nineveh (British Museum, N.1806)

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PART THREE: Material Culture

General Introduction

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> 'Our knowledge of the pre-Islamic past of Iran can be advanced only by new discoveries, and archaeology is far more important in this land with few written sources than in more favoured regions of the Mediterranean'.
>
> Frye 1976: 93.

The Sasanian empire was one of the great powers of Late Antiquity (Figure 1). Founded in AD 224 by Ardashir I (AD 224–242), an Iranian noble whose family came from the city of Istakhr in Fars province of southern Iran, he adopted the previous Parthian capital of Ctesiphon in southern Iraq as his own. He established a powerful family dynasty and an empire which thrived for four centuries. Political continuity was strengthened by closer integration of the administration of the provinces of Iran, Mesopotamia, and adjacent territories. Rapid military successes by his successor Shapur I (AD 242–272) triggered crisis in the Roman empire, followed by drastic economic reforms and re-organisation of the Roman army to recreate a temporary status quo until a century later when Shapur II (AD 309–379) aggressively expanded his empire westwards into upper Mesopotamia. The Sasanian threat remained constant and, under Khusrau II (AD 590–628), armies surged across the eastern Roman empire again but now holding onto, and consolidating, their gains for up to a generation. However, brilliant counter-offensives by Heraclius, political implosion in Ctesiphon, and increasingly bold Arab probes along the southern frontiers of both great powers finally led to the collapse of the Sasanian empire during the second quarter of the 7th century.

Sasanian studies have been traditionally dominated by Iranologists, art historians, numismatists and/or scholars most familiar with Classical, Armenian, Jewish

Figure 1. Map showing the extent of the Sasanian empire at its height (drawing: P. Goodhead)

Figure 2. Monumental Sasanian relief at Naqsh-i Rustam showing Hormizd II (photograph: author, 2000)

or later Arab sources. Academic research began as an antiquarian numismatic pursuit with correlations of coin portraits with well known rulers, and thence to create a typology which could be adapted to the identification of individuals on rock reliefs or silver vessels. In the absence of many surviving primary historical sources, numismatic, glyptic, art-historical and architectural studies have defined the field, and discussions of rock reliefs, stuccoes, silver and silks, cut glass, coins, glyptic and bullae have shaped opinions on the development and impact of Sasanian art and material culture.[1]

These studies have in turn created the picture of a rich courtly culture with a strong Iranian character moderated in part by Western artistic influences. However, the archaeological evidence 'points to a considerable regional heterogeneity of material culture within the Sasanian empire, although the historical sources indicate a tendency towards political centralism right from the beginning of the state'.[2] The corresponding consumable culture of the masses is much less understood, as is the economy which not only sustained and supported the Sasanian empire for four centuries but also underpinned its consistent military superiority over its western rivals and effective defence against successive powerful threats along its eastern frontier. Moreover, the glamorous concept of 'Silk Roads' trade in luxury commodities and studies of Sasanian silver coinage have clouded appreciation of the importance of internal trade and everyday transactions. There is increasing interest in these topics, how the empire really functioned and the need for serious historiographic analyses has been reiterated by several scholars.

This collection of essays builds on some of these questions and offers an approach which is based almost entirely on archaeological sources. These have attracted much less attention among non-archaeologists and syntheses of the data, either by region or category, are rare.[3] The first attempts to identify archaeological data of this period began with antiquarian travellers passing through the region in the early 19th century. Several observed the eroded remains of the Gorgan wall and its interval forts, the large fortress at Gomish Tappeh and remains of old canals, but most concurred in the opinion that these were built by Alexander, referred to locally as Iskander.[4] Many others drew attention to Sasanian rock reliefs at Bishapur, Naqsh-i Rustam, Naqsh-i Rajab and another, subsequently erased, at Rayy and speculated on their identifications (Figure 2). A distinctive class of decorated pottery typical of northern Iraq was first recognised as being Sasanian by Claudius James Rich when he found sherds of it on the surface of the important yet never re-investigated site of Eski Kifri

[1] Harper *et al.* 1978; Kröger 1982; Gyselen 1989; Overlaet (ed.) 1993; Whitehouse 2005; Demange (ed.) 2006; Harper 2006.
[2] Huff 1987: 302.
[3] Huff 1987; Mousavi and Daryaee 2012.
[4] Sauer *et al.* 2013: 4–14, 630–47.

Figure 3. The first sherd of Sasanian pottery to be published is from Layard's 19th century excavations on the mound of Kuyunjik at Nineveh (British Museum, N.1806)

in 1820.[5] Further fragments were recognised by almost all of the subsequent 19th century excavators of the Assyrian palaces on the mound of Kuyunjik at Nineveh and retained with other diagnostic sherds, glassware, metalwork and coins recovered from the extensive and deeply stratified late period occupation at the site (Figure 3).[6] Throughout the 19th century, many British political agents, envoys and soldiers also commented on and/or made their own investigations of evidence for Zoroastrian funerary practices found in the form of reused jar or carved stone ossuaries across the Bushehr peninsula (Figure 4).[7] During the 1920s and early 1930s scholars were presented with a steadily increasing body of archaeological data from this period, firstly from Iraq as excavations there revealed elaborate stuccoes and distinctive types of pottery and glass at Kish,[8] Ctesiphon,[9] Nineveh[10] and Nuzi[11] (Figure 5).

The abolition of the French monopoly in October 1927 and the ratification of a new Antiquities Law on 3rd November 1930 were followed by a scramble of archaeological activity across Iran. In the following

Figure 4. Re-used Sasanian torpedo jar containing excarnated human remains and found at Bushehr in the 19th century (British Museum, 91952)

year further stuccoes were found decorating a pillared building south of Damghan, investigated as part of the University Museum Philadelphia / Pennsylvania Museum of Art joint project at nearby Tepe Hissar (Figure 6),[12] and during the extensive clearance of the late Sasanian citadel of a small town, possibly that of old Shiraz, at Qasr-i Abu Nasr (Figure 7).[13] The long-term French excavations at Susa revealed an area of housing in Level IV which the excavator dated to the mid-4th century on the grounds that this equated to the

[5] Rich 1836: vol. I, 20; see Simpson 2013*a*.
[6] Simpson 1996*a*; 2005*a*; 2005*b*.
[7] Simpson 2007*a*; Simpson and Molleson 2014; Simpson 2019*c*.
[8] Langdon 1931*a*; 1931*b*; 1932; Langdon and Harden 1934; see Moorey 1978: 122–46.
[9] Reuther 1929; Kühnel 1933; Schmidt 1934; see Kröger 1982.
[10] Thompson and Mallowan 1933; see Simpson 1996*a*; 2005*a*.
[11] Ehrich 1939; see Potts 1996.
[12] Pope 1932; Kimball 1937.
[13] Frye (ed.) 1973; Whitcomb 1985.

Figure 5. Sasanian stuccoes shortly after their discovery at Kish (after Langdon 1931*b*: fig. 3)

Figure 6. The remains of the columned hall of a small residence near Tepe Hissar with *in situ* stuccoes (after Pope 1932: fig. 6)

occupation destroyed by Shapur II in AD 341, and the city went into decline thereafter until the late Sasanian period;[14] however, many of the early reports of Sasanian structures, tombs and pottery are incorrectly dated and most of the recovered finds poorly stratified.[15] Between 1935 and 1941, the French expedition also excavated at Bishapur where they created the first plans of the remains and cleared part of the palace complex at the eastern end, revealing mosaics and part of an enigmatic partly sunken structure commented on by many European travellers since 1809 and interpreted by the excavator as a fire-temple (Figure 8).[16]

During the late 1950s a trickle, rising to a flood, of Sasanian antiquities and modern imitations began to

[14] Ghirshman 1952.

[15] e.g., de Mecquenem 1931; see Boucharlat 1987; Boucharlat and Haerinck 2011.

[16] Ghirshman *et al.* 1956; 1971; see Frye 1976.

Figure 7. View looking across the summit of the citadel of Qasr-i Abu Nasr with the bastion overlooking the entrance at the rear and modern Shiraz behind (photograph: author, 2000)

Figure 8. View of the so-called fire temple or temple of Anahita at Bishapur (photograph: author, 2000)

enter the art market following a combination of large-scale licensed commercial and illegal excavations in Iran. Most notably, these included large numbers of silverwares and a small number of rock crystal objects (Figure 9).[17] There were also hundreds of Sasanian cut glass bowls and a much smaller number of closed forms, and most major public and private collections with Iranian interests – from America to Japan – soon acquired examples of these (Figure 10).[18] The Gilan region of north-west Iran was said to be the source

[17] e.g., Grabar *et al.* 1967; Muscarella 2000: 203–205.

[18] e.g., Fukai 1973; 1977; Whitehouse 2005; Goldstein *et al.* 2005.

of these and earlier objects, although this is unlikely to be the only provenance and many silverwares are of dubious authenticity. A small number of helmets, long swords in highly decorated scabbards (Figure 11), and plain or fluted vessels cast from high-tin bronze also appeared on the market,[19] and were reported to come from the Dailaman district of Gilan where one Iranian claimed to have seen children playing with ancient swords during his visit 'to inspect my timber business' in 1951.[20] There were strong vested interests in the commercial value of such discoveries and those archaeologists who ventured into this region faced tough challenges. An Iranian archaeological expedition excavating at Marlik in 1961/62 not only witnessed illegal digging around the site before, during and after their work, but on one occasion had their tent slashed at night,[21] and the Japanese expedition to Dailaman also regularly encountered systematic looting at sites through the region.[22] However, both made discoveries that support reports that this region was one of the sources for Sasanian objects circulating on the art market, and several Sasanian dipper jugs found in the disturbed upper layers at Marlik reflect its proximity to a Sasanian fortress.[23] In the meantime, the Japanese mission investigated reports of numerous cemeteries having been recently commercially excavated in the Halimehjan valley: the reported finds included iron swords, glassware, stamp seals, silver plates, gold ornaments and carnelian beads which are consistent with a Sasanian date,[24] and a more recent evaluation of these looted sites confirms a large number date to the Partho-Sasanian period (Figure 12).[25]

Throughout the 1960s and 1970s, archaeological fieldwork projects not only had a research agenda but also served as part of a larger package of national promotion alongside the government's ambitious redevelopment and restoration programmes. Large-scale irrigation projects in south-west Iran were accompanied by extensive archaeological surveys, notably of Khuzestan in 1960/61,[26] the Deh Luran plain in 1968/69,[27] and the Susiana plain in 1973.[28] Moreover, research into the Sasanian period was given a high public profile within Iran as it marked one of the high points, alongside that of the Achaemenids, in

Figure 9. Late Sasanian silver bowl, said to have been found in Iran (British Museum 133033)

Figure 10. Late Sasanian cut glass vase, said to have been found near Amlash (British Museum 135712)

[19] e.g., Grancsay 1963; Overlaet 1982; 2004; Melikian-Chirvani 1974; Moorey 1976; Mahboubian 1997: 275, cats 354a–b; see Lang and Simpson, this volume.
[20] Mahboubian 1997: 27.
[21] Negahban 1996: vol. I, 5–11, vol. II, col. pl. VIIIA.
[22] Fukai 1968: 4; Ohtsu, Nokandeh, Yamauchi and Adachi (eds) 2006: fig. 22.
[23] Negahban 1996: vol. I, 227–28, vol. II, fig. 22, pls 106–107, nos 542–46; see Simpson, this volume 316, fig. 63.
[24] Fukai and Matsutani 1977; 1980.
[25] Simpson 2015*a*.
[26] Adams 1962*a*.
[27] Neely 1970; 1974.
[28] Wenke 1975; 1975/76.

Figure 11. Late Sasanian crucible steel sword with decorated silver scabbard, said to have been found in Gilan (British Museum 135739 / 135747)

the sequence of pre-Islamic Iranian monarchies.[29] As a result, during the military parades held at Persepolis during the Shah's controversial celebration of the 2,500th Anniversary of the Founding of the Persian Empire in October 1971, recreations of Achaemenid and Sasanian army uniforms constituted 38% of the total (Figure 13).[30] The site below the Achaemenid royal tombs at Naqsh-i Rustam was partly levelled and formal paths laid in preparation for the associated events, revealing two minor Sasanian rock reliefs on the lower cliff face in the process (Figure 14),[31] although construction of an access road cut through the massive Sasanian mudbrick fortifications enclosing the site (Figure 15). Ali Akbar Sarfaraz was among those archaeologists at this time who embraced the new nationalist ideology: at Firuzabad (Gur) he cleared part of the Sasanian palace (Figure 16), while at Bishapur a 250 m stretch of the 9 m thick fortifications and the foundations of a triumphal gateway were excavated (Figure 17).[32] In 1957 a group from the Fars army concluded several years of work in the Mudan cave at Bishapur by resurrecting the fallen upper part of the carved statue of Shapur I on reinforced concrete legs, with fragments displayed nearby, enlarging the mouth of the cave enlarged and laying out paths (Figure 18). Between 1959 and 1978 the German Archaeological Institute conducted careful excavations and consolidation of the late Sasanian fire-temple sanctuary of Adhur-Gushnasp at Takht-i Sulaiman (Figure 19);[33] following a preliminary survey of the Firuzabad plain in 1972,[34] the same institute investigated Ardashir I's palace at Qaleh-i Dukhtar near Firuzabad (Figure 20).[35] Between 1968 and 1978, excavations at Haftavan tepe, south-west of Lake Urmia, revealed a number of Sasanian graves on the summit of the mound and cutting an earlier Sasanian phase of occupation when the mound had been crowned by a circular fortification wall with repeating horse-shaped shaped towers projecting from the exterior (Figure 21).[36] The appearance of this fort resembles a second discovered on the summit of the steep-sided main mound of Tureng tepe in the Gorgan plain during French excavations there between 1967 and 1975 (Figure 22).[37] Meanwhile, between 1970 and 1977, the late M.Y. Kiani was exploring the sites on the Gorgan plain, including the remains of the Gorgan wall to the north: he proposed a Parthian date for this during the reign of Mithradates II (123–87 BC) based on a combination of brick sizes, pottery, and architectural parallels and a misconception over the height of the Caspian sea-level in antiquity, although he admitted the presence of Sasanian occupation and illustrated a late Sasanian faceted glass cylinder vessel from Trench F at Fort 12.[38] The British Institute of Persian Studies supported a photographic survey of some of the major rock reliefs,[39] and an eagerly anticipated Sasanian origin for the early Islamic Persian Gulf port of Siraf was matched by the discovery of a fortified complex beneath the massive early 9th century Congregational Mosque (Figure 23).[40] The excavator, the late David Whitehouse, was quoted in *The Iran Tribune* (April 1970) as saying that 'one might speculate that we have here the remains of a port which served that great Sassanian city of Firoozabad' and further evidence for Sasanian involvement in maritime

[29] Abdi 2001: 67.
[30] Ministry of Information 1971.
[31] Roaf 1974.
[32] Sarfaraz 1969; 1970; Yasi 1977.
[33] Naumann and Naumann 1976; Naumann, Huff and Schneider 1975; Huff 2011*a*: 102–105.
[34] Huff 1974.
[35] Huff 1976; 1978.
[36] Burney 1968; 1972.
[37] Boucharlat and Lecomte 1987.
[38] Kiani 1982*a*; 1982*b*.
[39] Herrmann 1976.
[40] Whitehouse 1971*a*; 2009.

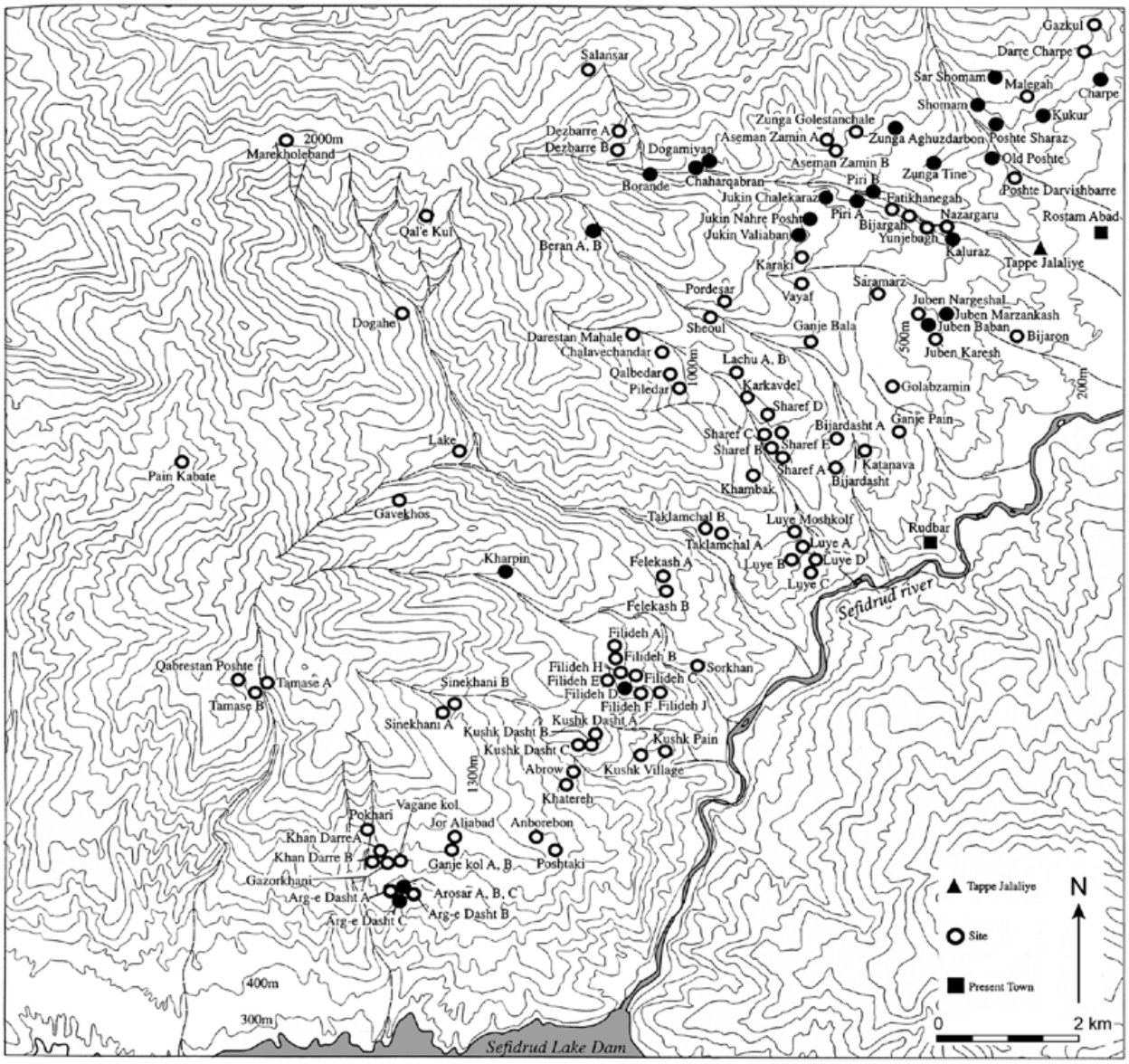

Figure 12. Map of archaeological sites located on the 2001–2006 Iran/Japan archaeological survey of the western Sefid Rud, with Partho-Sasanian sites highlighted as solid dots (after Ohtsu, Nokandeh, Yamauchi and Adachi (eds) 2006: fig. 22)

trade was argued by Andrew Williamson.[41] He delivered a lecture on this subject at the British Academy on 21st June 1972, which was attended by Reza Shayegan, the managing director of the National Shipping Lines: the full text owas enthusiastically published shortly afterwards in *The Times* and *Kayhan International*. This promotion of the military and economic aspects of the port of Siraf was timely given the Shah's obsession to develop Iran as a major sovereign military power and rival of Iraq, and play a larger role in Middle Eastern politics, develop more Persian Gulf ports and air-bases and safeguard oil exports through the Persian Gulf and Indian Ocean.[42]

During these decades many bridges, weirs, and causeways across Iran were attributed a Sasanian date,[43] ruined *chahar taq* structures interpreted as Zoroastrian fire temples,[44] free-standing rock-cut monuments described as open-air Zoroastrian fire-altars,[45] and a circular moated rampart at Tal-i Khandagh near Sar Mashhad interpreted as an exposure *dakhma* founded by the powerful Zoroastrian priest Kirdir in the 3rd century.[46] Alongside these reports, the remains of a large Nestorian monastery on Kharg island was extensively excavated by the French expedition and a preliminary

[41] Williamson 1972; Whitehouse and Williamson 1973.
[42] Simpson 2019*a*; cf. Alam 1991: 103–104, 153, 155–56, 176, 180, 200–202, 252–53, 261, 362.
[43] e.g., Stein 1940: 15–16, 48, 71–74, 171–74.
[44] e.g., Vanden Berghe 1961.
[45] e.g., Stronach 1966; Trümpelmann 1973.
[46] Trümpelmann 1984: 317–18.

Figure 13. Costume for a Sasanian commander in chief, designed for the 2,500th Anniversary of the Founding of the Persian Empire parades held at Persepolis in October 1971 (Ministry of Information 1971)

Figure 14. View of a small Sasanian relief discovered at Naqsh-i Rustam (photograph: author, 2000)

Figure 15. View of the unexcavated Sasanian fortifications around the complex at Naqsh-i Rustam (photograph: author, 2000)

Figure 16. View of the Sasanian palace at Firuzabad/Gur (photograph: author, 2000)

Figure 17. View of the exterior of the excavated Sasanian fortifications at Bishapur (photograph: author, 2000)

report published which interpreted it as evidence for a 6th century Christian presence.[47] This dating has been regularly repeated in more recent years, as further discoveries of churches and monasteries along the Persian Gulf and in the Iraqi Western Desert have been cited as evidence for the rise of the Nestorian Church during the late Sasanian period.[48]

However, despite these numerous discoveries and reports, the literature is filled with assumptions and unreliable or circular dating. Frye criticised the situation in typical style in the opening words of a paper given at a conference of Iranologists in Munich:

> 'During eight years of intermittent residence in Shiraz, I have made many trips to sites and monuments of Fars province. From the beginning of my acquaintance with many structures, I have raised the question: just how do isolated monuments receive a designation as Achaemenid, Sasanian or Islamic when there are no written sources which tell us what the remains were and their dates? Sometimes the identification and dating seemed to have been passed on throughout the years, decades or even centuries, from a chance remark of a traveller rather than from a detailed study on the premises. It is not my intention here to answer any questions regarding architecture, or such technicalities which

[47] Ghirshman 1960; Steve 2003.
[48] Bowman 1974; Gropp 1991; Lerner 1992; Hellyer 2001; Elders 2003; Hauser 2007*a*; Horn and Hunter 2012.

Figure 18. Real postcard photographic print showing visitors admiring the restored statue of Shapur I inside the Mudan cave (EPH-ME 8154, presented by Dr G. Herrmann)

Figure 19. View of the lake and the late Sasanian fire-temple sanctuary of Adhur-Gushnasp at Takht-i Sulaiman (photograph: author, 2004)

Figure 20. General view of Ardashir I's fort at Qaleh-i Dukhtar near Firuzubad
(photograph: Paul Gotch, 1966)

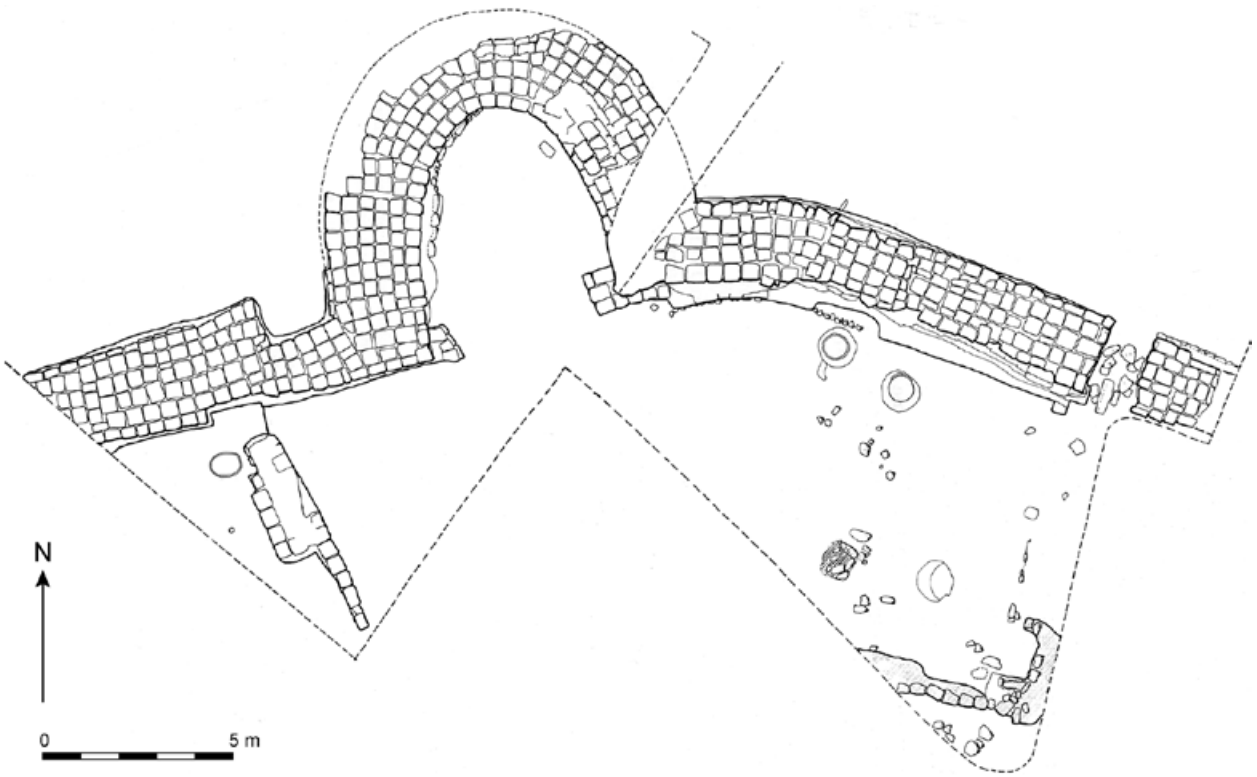

Figure 21. Plan of the excavated section of a Sasanian fort on the summit of Haftavan tepe in north-west Iran
(after Burney 1973: fig. 10)

Figure 22. View of the main mound crowned by the Sasanian fort at Tureng tepe in north-east Iran (photograph: author, 2004)

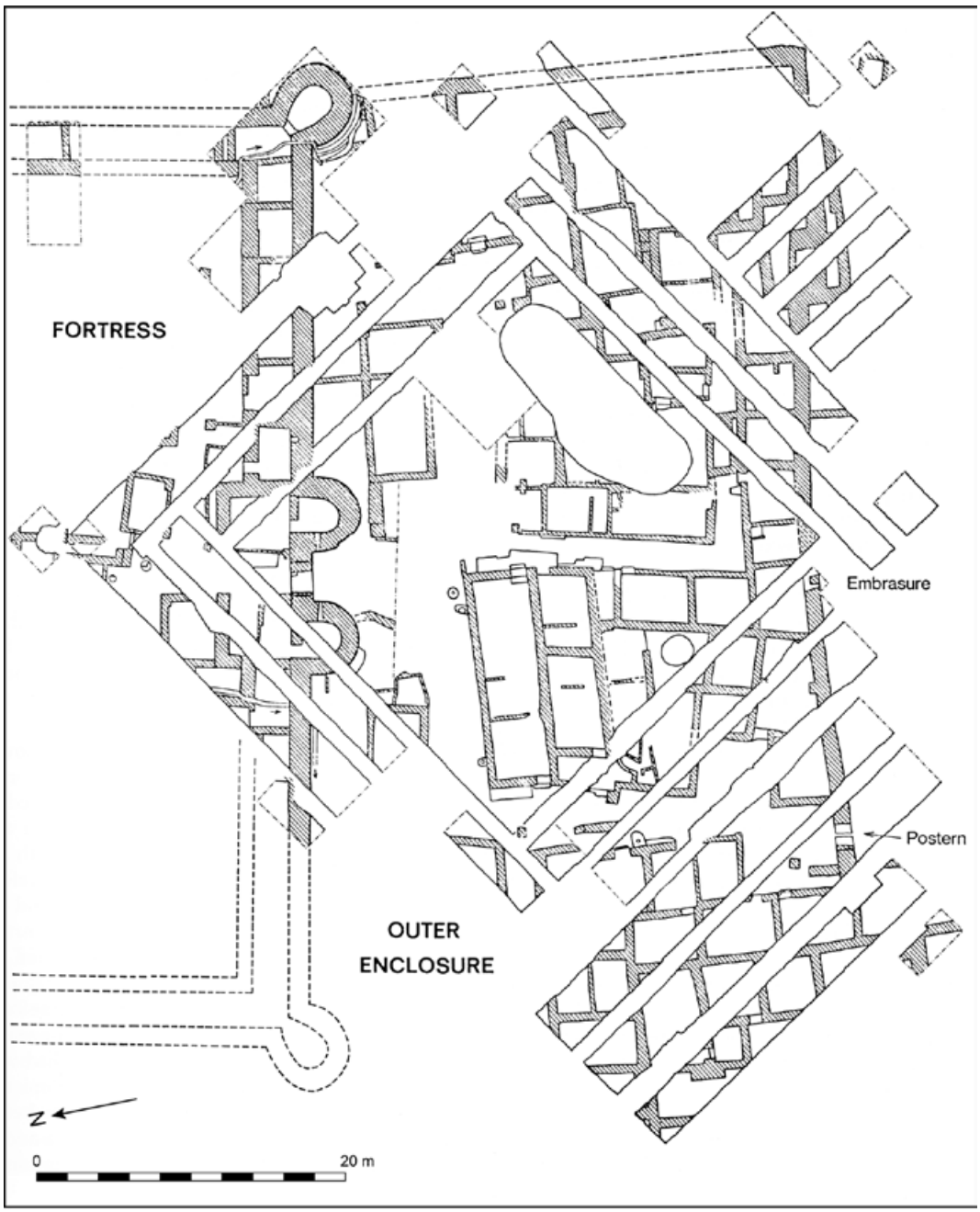

Figure 23. Plan of the so-called Sasanian fort and enclosure at Siraf (after Whitehouse 1972: fig. 3)

Figure 24. View of the exterior of the so-called Sasanian palace at Sarvistan (photograph: author, 2000)

> are the province of the archaeologist, for I am quite unqualified to even use a sextant in the field much less to analyze squinches or arches. Rather I wish to raise questions which I believe need answer and perhaps thus stimulate an interest in the historical remains of Fars province, the homeland of the Achaemenids and the Sasanians. In many cases, how can we distinguish between the original construction of a building or a dam, repairs made later, or extensions or radical changes in the plan or execution of the structure? One observation I have made which has impressed me over the years is the continuity in methods and types of construction in Iran throughout the centuries. Such statements that smooth and fine stone work on an isolated, ruined structure, must be Achaemenid because the Sasanians or the Iranians of Islamic times never did, or could not execute, comparable works, in my opinion, should be discarded'.[49]

The small vaulted building at Sarvistan is a good instance of this (Figure 24). This structure was first recorded by European travellers in the mid-19th century, and as early as 1910 was interpreted as the remains of a minor Sasanian palace on the basis of a literary reference by al-Tabari (d. AD 923) to the construction of a palace near Fīrūzabad by Mihr Narseh, the vizier of Varahran V (AD 421–438). A number of later scholars have questioned this interpretation and dating, including Bier who argued for a considerably later – mid-8th to mid-10th

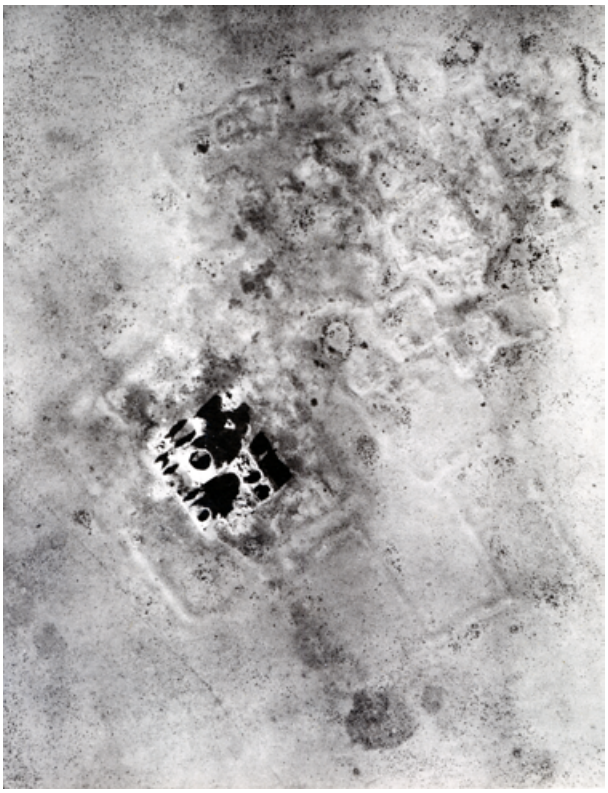

Figure 25. Aerial view of the same building taken in 1936 (after Schmidt 1940: pl. 21)

[49] Frye 1979: 335–37.

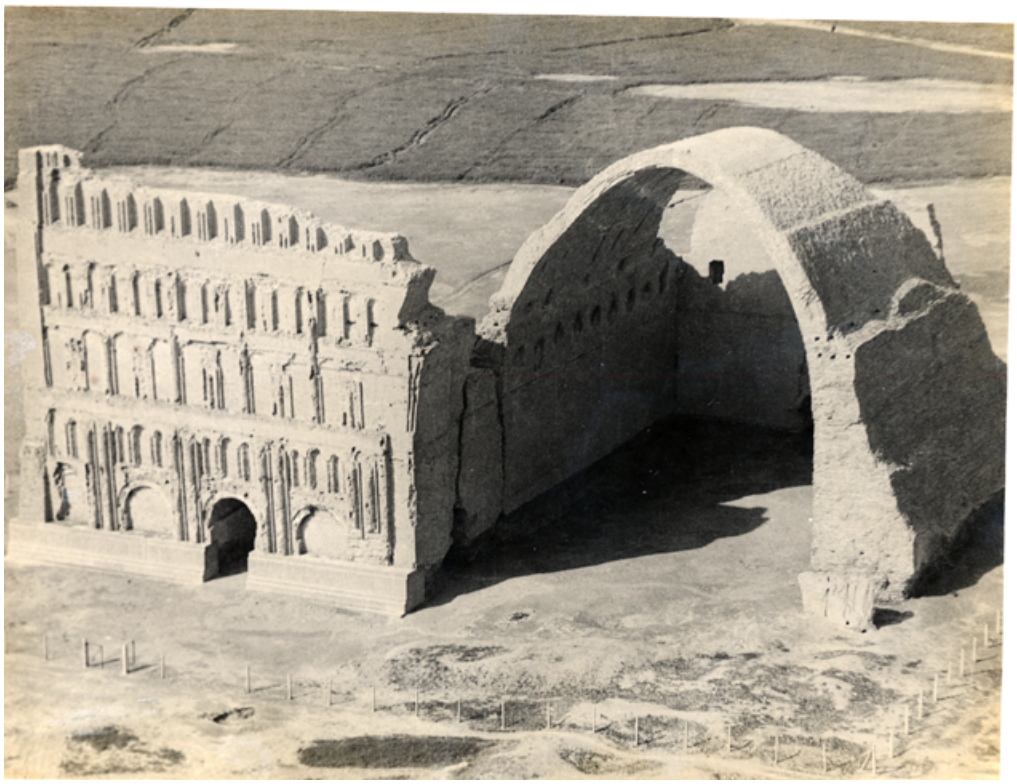

Figure 26. Aerial view of the Taq-i Kisra (British Museum/Middle East archives)

century – date on the basis of architectural features, and suggested that it may have been a Zoroastrian fire sanctuary rather than a palace.[50] Stein commented on how the building 'now rises in splendid isolation, but the amount of broken pottery, much of it glazed green ware, strewn around it over a considerable area shows that habitations of a humbler sort must have stood near by'.[51] A number of walls in this area are visible on aerial photographs taken by Schmidt in March 1936, leading Whitcomb to reiterate that it was part of an urban complex rather than an isolated monument (Figure 25).[52] These outlying remains have since been largely destroyed by agricultural works, but soundings excavated around the main building in 2002 suggest a possibly late Sasanian foundation although the most significant phase of occupation was indeed in the early Islamic period.[53]

The Taq-i Kisra near Ctesiphon provides another good example (Figure 26). This monument corresponds to the 'great *iwan*' of Arab Conquest historians such as Yaqubi which he specifies as being in the royal city of Aspanabr (or Aspanbor) and which lay the equivalent of a mile [1.6 km] south of Ctesiphon.[54] This area is said to have been residential during the reign of Kavad (AD 488–496, 499–531), Khusrau I (AD 531–579) constructed a palace here with the assistance of 'Roman expertise' and 'Greek marble, building experts, and craftsmen skilled in ceilings' which were supplied by Justinian,[55] and another description refers to Khusrau commissioning a palace mural commemorating his sack of Antioch in AD 540.[56] A royal aviary, game reserve, stud, treasury and church are also attested in written sources, a bath-house has been partially excavated a short distance due west of the Taq-i Kisra, and the foundations and platform of a large building originally decorated with stuccoes located immediately to the south at the spot known today as Tell ad-Dhabai.[57] Pottery and coins found in the vicinity of the *iwan* suggest a late Sasanian date of construction but piecemeal planning and construction of the surrounding complex was suggested by the early excavators and may explain some of the discrepancies between later Arab authors.

Within highland Iran, the 'fire-bowls' have now been proven to simply be the remains of *astodans* which have lost their lids,[58] many of the *chahar taq* structures demonstrated to be much later *imamzadehs*,[59] and

[50] Bier 1986.
[51] Stein 1936: 179.
[52] Whitcomb and Sumner 1999: 215–16.
[53] Askari Chāverdi 2010; 2012.
[54] el Ali 1968/69: 426.
[55] Theophylact Simocatta *History*, V.6.10.
[56] Shahid 1995: 235–36.
[57] Kröger 1982: 18–37, pls 3–5.
[58] Huff 1998; 2004.
[59] e.g., Huff 1974: 157.

Figure 27. View of the excavated early medieval monastery at Sir Bani Yas (photograph: Emma Thompson, 2009)

the site of Tal-i Khandagh (described above) is more likely to be a fortified site.[60] The historically attested importance of the Persian Church is unchallenged but its architectural footprint is now nebulous as the monasteries on Kharg island and Sir Bani Yas, as well as the parochial churches at al-Qusur on Failaka and Akkaz island, have been convincingly re-dated to between the late 7th and early 9th centuries.[61] Moreover, they have been shown to be part of a wider development of coenibitic monasticism and proselytisation on the desert margins of Arabia following a period when evidence for permanent settlement is remarkably scarce (Figure 27).[62]

Beyond the modern Iranian borders other important discoveries were being made during this period. Extensive archaeological surface surveys begun in Iraq in 1956 demonstrated large-scale Sasanian water engineering works across the Mesopotamian alluvial plains, leading Adams to conclude that this was 'the apogee of ancient developments on the central Euphrates floodplain'.[63] One implication of these results was that the Sasanian state had invested sufficiently heavily in the region to indicate that they regarded it as an integral part of its empire and, although the ceremonial heart of the dynasty lay on the plateau, Mesopotamia was a major economic and cultural centre.

The shift to the west in the political power-base is also reflected in the increased number of building projects in western and north-west Iran. In 1964, the Italian archaeological expedition to Iraq began investigations in the Seleucia/Ctesiphon area. Directed first by Gullini, then by Invernizzi, these were the first excavations to be conducted at the political centre of the Sasanian empire since 1931. Among their important results was clarification of the urban topography, confirmation that the 'round city' next to Seleucia was the remains of Veh Ardashir rather than Ctesiphon, and the exposure of large areas of vernacular architecture and workshops within the curving fortifications (Figure 28).[64]

Archaeology abroad is always at the mercy of foreign politics. The Islamic Revolution in Iran in 1979 was followed by the long Iran–Iraq war. Although local Iranian archaeologists persevered under difficult conditions, all foreign archaeological projects in that country stopped for many years. Many of these archaeologists moved across the Persian Gulf to work on earlier periods in eastern Arabia, particularly the United Arab Emirates, where as early as 1972 Beatrice de Cardi had published evidence for a small Sasanian settlement on an islet near the tip of the Musandam peninsula which she interpreted as the remains of a 'a military outpost to watch movements of shipping in the

[60] Ghasemi 2012*a*.
[61] Kennet 2007; Carter 2008; Simpson 2018*a*.
[62] Payne 2011.
[63] Adams 1981: 200.
[64] Gullini 1966; Invernizzi 1976; Gullini (ed.) 1985; Simpson 1997*a*; 2015*b*.

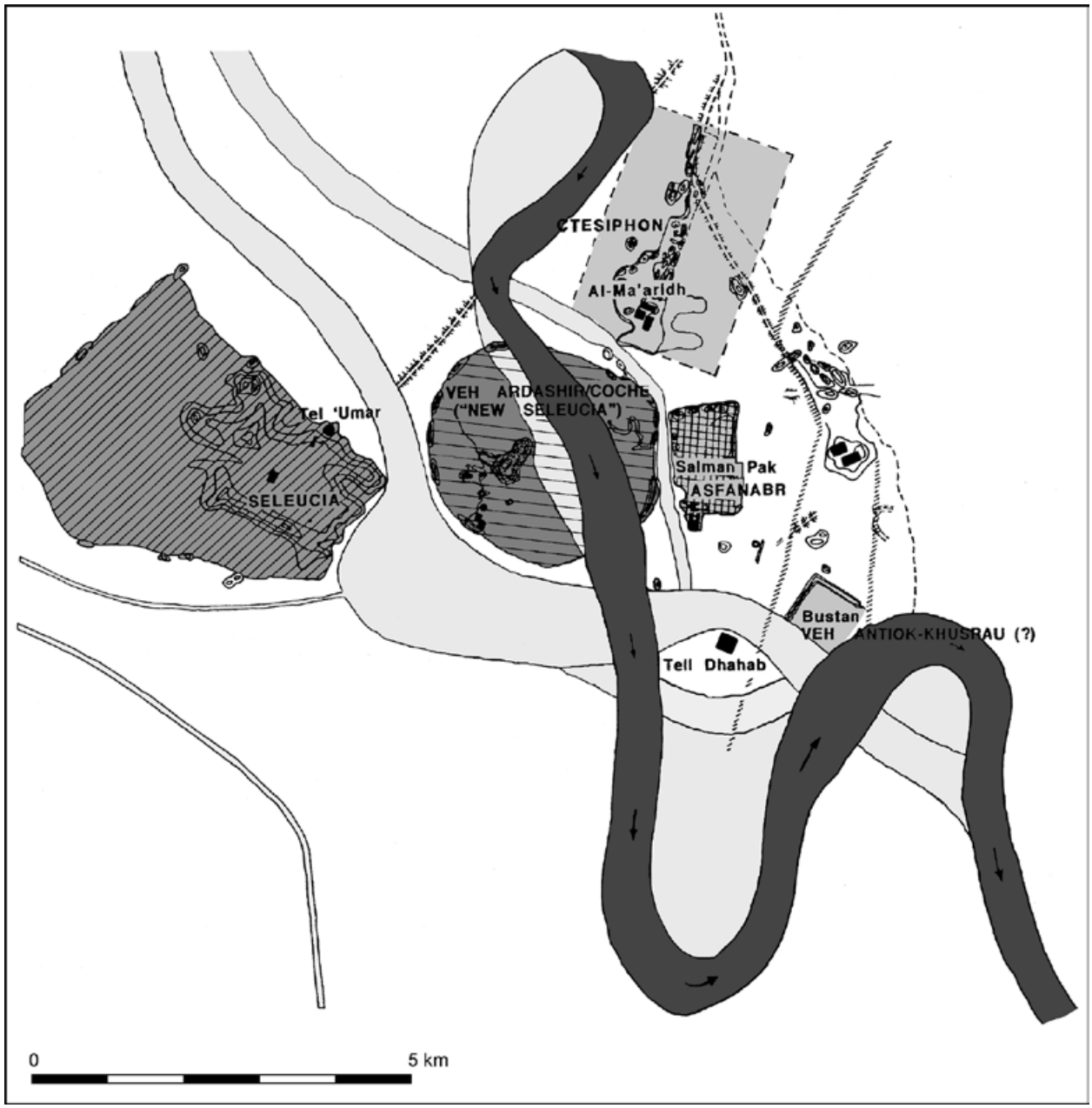

Figure 28. Plan showing the relationship of some of the sites forming the Ctesiphon conurbation (reconstruction by the author)

narrow Strait of Hormuz'.[65] Ironically, the site has been levelled since as part of construction associated with a small naval station.

Although less well appreciated in the context of Sasanian studies, important discoveries have been made in the last few decades in the southern Caucasus and Central Asia. Within the former region, Sasanian silverwares have been found at Shemakha in Azerbaijan, and Mukuzani and Mtskheta in eastern Georgia.[66] Excavations in the old city of Dvin have apparently produced evidence for glass production, and the range of cut, moulded and plain glass vessels illustrated from excavations at sites in Azerbaijan, eastern Georgia and Armenia suggest that this was a major centre for Sasanian glass in parallel with Mesopotamia.[67] It is no coincidence that both regions border the eastern Roman empire and cross-cultural influences are therefore likely to have stimulated fashions and industries in both regions. All of the Sasanian finds from the Caucasus have been found at sites within the territory of the kingdoms of Iberia and Albania which became satellite kingdoms in

[65] de Cardi 1972: 308; 1975: 30–34.
[66] Khalilov 1985; Soltes (ed.) 1999: 201, 204–205, cats 98, 104.
[67] Simpson 2015*a*.

Figure 29. Oblique aerial view of the ancient city-site of Merv: the Sasanian and earlier city is on the right and its medieval successor is on the left (Google Earth, 2009)

the 3rd century and were finally absorbed as provinces of the Sasanian empire in the 5th and 6th centuries. This region offers a much more likely place of production for the complete glass vessels reportedly found in graves in the Gilan region of north-west Iran for this was, to adapt Adams' catchphrase for the Diyala, 'the land behind the Caucasus' in this period, as it was before.[68]

On Iran's interface with Central Asia, evidence for Sasanian activity north of the Kopet Dagh was regularly encountered by Soviet archaeologists during their surveys and excavations in southern Turkmenistan. The strongly Marxist-influenced ideology resulted in this period being interpreted as a feudal society following the so-called 'period of slave-owning society' which was equated with the Parthian period. The frequent occurrence of low-denomination coins was used to help secure the dating and important excavations carried out in parts of the city-site of Merv led to significant discoveries of monumental and domestic architecture, most notably a Buddhist monastery founded in the 4th century (Figure 29).[69] More recent analyses of the previously excavated coins have led to many re-attributions, entailing a re-dating of the associated stratigraphy in many cases,[70] and the employment of more careful excavation and the recovery of environmental remains for the first time have added considerable new information about the development of the city and the surrounding oasis during this period.[71]

The interpretation of archaeological data is as subject to the paradigms of the day as the analysis of historical sources but, as this short review attempts to show, this alternative set of evidence offers an important avenue

[68] Simpson 2014*a*; 2015*a*; Shikaku 2013: 357; 2019.

[69] Pugachenkova and Usmanova 1995.
[70] Loginov and Nikitin 1993.
[71] Simpson 2008*a*; 2008*b*; 2014*b*.

for examining the achievements and development of Sasanian society, its economy and its material culture. Mapping these in detail against historical developments remains a great challenge, and both greater control of the dating and more cautious interpretation of how the archaeological evidence reflects specific historical events, as opposed to cultural-economic developments, is required in future. The need for syntheses of the data, as well as more critical editions, has been called for by historians and archaeologists alike in recent years.[72]

The development of the present volume has had a gradual evolution, rather than a sudden birth, and has taken much longer to publish than intended, but the publication still seems to be the right thing to do at the present time. It was inspired by the results of several specialist workshops held at the British Museum in connection with post-excavation analyses arising from the author's excavations at Merv, as well as related research on the Sasanian collections, and was developed to include the present set of contributions. The editor is very grateful both to the contributors for submitting their papers and for their huge patience while this volume was assembled, and to the reviewers for their comments on the contents.

This publication follows several international exhibition on Sasanian luxury arts,[73] two published conferences devoted to Sasanian history and archaeology,[74] and the first formal catalogues of Sasanian glass in public or private collections.[75] The results of major research projects at Merv (present-day Turkmenistan), Gorgan (Iran) and Kush (United Arab Emirates), also offer new avenues for exploring survey and excavation data for this period.[76]

The approaches taken by the contributors to the present work vary necessarily according to the data they are concerned with, but in order to place them within a wider research framework, this monograph is divided into three parts in order to address some of the key archaeological issues. It begins with a selection of essays dealing with sites and landscapes in different regions of the Sasanian empire. This is followed by two further sections, one dealing with aspects of the agricultural economy and the other on how studies of surviving material culture help inform our ideas of craft and industry. Each section is preceded by a short introduction outlining some of the most important relevant textual and archaeological background to these broad topics. There are many areas which could be included but which have not. This is not an attempt to create a systematic overview, let alone the 'inventory of all archaeological sites [which] should be established as a first measure toward the critical assessment of the archaeological data' that one writer has proposed.[77] It is intended instead to explore some fruitful avenues of academic discussion and includes research by different international scholars, some well established and others at early stages of their careers. It should go without saying that some statements and conclusions may prove to be wrong, but without publication and discussion there is intellectual sterility.

In memoriam: V.A. Zavyalov

You were one of the finest archaeologists to work in Central Asia, and one of my closest and longest friends and colleagues, with almost 30 years of work together in Central Asia, Russia and England. I value your experience, scholarship, humour and company to the end, remember that everything must be logical, and dedicate this work to your memory.

[72] e.g., Shayegan 2003; Morony 2008; Bakhos and Shayegan 2010; Mousavi and Daryaee 2012.
[73] Demange (ed.) 2006.
[74] Sarkhosh Curtis and Stewart (eds) 2008; Kennet and Luft (eds) 2008.
[75] Whitehouse 2005; Goldstein *et al.* 2005.
[76] Sauer *et al.* 2013; Simpson *et al.* forthcoming *a*; forthcoming *b*.
[77] Shayegan 2003: 368.

PART ONE:
Sites, Settlements and Landscapes

St John Simpson

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> 'Population may have peaked on the Susiana Plain during the Parthian Period, but it was imperial Sasanian investment that radically transformed settlement and subsistence in the area. Kilometers of qanats, large new canals, and massive stone weirs were constructed to ensure and expand cultivation and to supply new urban centers. Much design work on the hydrological system was apparently done by captured Roman engineers. Extensive agricultural investment was also made in the Deh Luran area where population reached unprecedented levels'.
>
> Johnson 1987: 291.

Introduction

At its greatest extent, the Sasanian empire extended from the plains of northern Syria to the central Asian steppe, and from the mountains of the Caucasus to the shores of the Indian Ocean. Intimate knowledge of these hugely varied landscapes helped shape a range of responses in terms of settlement, economy, and military defence. Extended travel times from one end of the empire to another must have prevented direct meddling of the state in everyday affairs but equally must have enabled administrators, whether civilian or military, to take efficient control of the regions and resources under their purview. The postings of these men, and the sharing of technical expertise and support by an efficient bureaucracy, must have been critical factors in the development and maintenance of the empire. The scale and quality of archaeological evidence which might be used to test this varies greatly. Most of the evidence relating to urbanisation and rural settlement patterns comes from Mesopotamia and south-west Iran, and this therefore forms the basis of the following section.

Urban landscapes

> 'Shapur left the territories of the Romans, taking with him prisoners whom he settled in the countries of Iraq, Susiana, Persia and in the towns his father had founded. He also founded three towns and gave them names derived from his own name. One was in the land of Maysan and was called Sod Shapur [Sadh-Shapur]. The second in Persia which is still called Shapur today [i.e., Bishapur]. He rebuilt Gundeshapur which had fallen into disrepair and named it Anti-Shapur [Antioch-Shapur], a word half-Greek and half-Persian, meaning: 'You are Shapur's equal'. He constructed a third town on the banks of the Tigris called Marw Habor which is 'Akbora and its environs [Buzurg Sabur]. These towns were populated by his prisoners who were provided with lands and home to till'.[1]

This statement in the medieval Nestorian *Chronicle of Se'ert* is one of several sources describing such effects of Sasanian military campaigns in the eastern Roman empire. They underline the fact that boosting the urban economy was central to Sasanian economic planning, and this is well illustrated by the archaeological evidence.

In about AD 220, Ardashir Papakan, founder of the Sasanian dynasty, founded a circular city in his homeland of the Firuzabad plain and named it Ardashir-Khurrah ('divine glory of Ardashir'). This was carefully laid out as a perfect circle measuring 1.85 km across,

Figure 1. View of the main structures in the centre of the city of Ardashir-Khurrah (photograph: author, 2000)

with a circular inner area which included a high tower (*tarbal*), *chahar taq* (Takht-i Neshin), and palace, and an outer area divided by radiating streets into 20 sectors.[2] Brief excavations by the Cultural Heritage Organisation of Iran in 2005 exposed wall and floor-paintings near the *tarbal* although few details have yet been published.[3] The city had four main gates and was fortified with high ramparts and a water-filled ditch fed by a canal (Figure 1), and the extension of the axes of the streets as radiating tracks extending across the surrounding plain underlines the symbiotic, as well as functional, relationship between the city and its hinterland.[4]

After his defeat of Artabanus V and adoption of the Parthian capital at Ctesiphon as his own, Ardashir founded another – more or less circular – city on the opposite bank of the river Tigris and next to the old Seleucid capital of Seleucia ad Tigrim. This new foundation was laid out around and on top of a small older settlement known in Aramic as Coche and given

[1] Lieu 1986: 478.

[2] Huff 1972; 1974: 157–59.

[3] Mousavi and Daryaee 2012: 1080.

[4] Huff 1974: 159.

the new name of Veh Ardashir ('City of Ardashir'), later Arabicised as Bahusīr.[5] The old core presumably held at least some of the major public buildings, although the limited excavations at Tell Baruda only revealed vernacular architecture.[6] The city covered an area of about 700 hectares and was enclosed within a curving mudbrick fortification wall with regular repeating towers along the exterior (Figure 2). The Italian excavations in the southern portion suggest an initial phase characterised by wells, drains, and bread ovens, followed by a progressive increase in settled density from the 4th to the latter half of the 5th century.[7] This change is marked by increasing subdivision of private properties and a gradual encroachment onto the adjacent streets. This sequence suggests the initial maintenance of well-prescribed property boundaries in an initial phase of comparatively low population density, followed by necessity to adapt with the inability to build elsewhere. The two excavated residential blocks are thought to largely consist of business shops and houses in the southern part (initially termed Area 1) and workshops and private houses in the northern part (Area 2). The business shops were typically situated along the street frontages. The mixture of functions within a given quarter resembles the traditional concept of a Middle Eastern *suq*, rather than a classical definition of segregated functions in different *insulae*, but marks another stage in a long-term development noted within late Parthian levels at Seleucia and also at Dura.

A third, almost circular, city exists at Darabgird in Fars although the walls may date to the 8th century as the mid-10th century author Hamza al-Isfahani states that the city was originally triangular but was enclosed within the present walls by the Umayyad governor of Fars, Hajjaj ibn Yusuf;[8] the surface pottery suggests continuity of occupation as late as the 12th century (Figure 3).[9] These circular (or almost circular) cities were the exception rather than the norm and they resemble glorified versions of local market centres with a convergence of tracks from all directions seen, for instance, on aerial photographs of Hatra.[10] Although a circular layout has military advantages, and is more economic in the use of building materials, it creates challenges for fitting the architecture within and it is unsurprising that most other cities were laid out on rectilinear plans. Some of these were continuations of much older centres although their occasional renaming was probably accompanied by infrastructure schemes.

Figure 2. Plan of the excavated portions of the southern quarters of Veh Ardashir (after Simpson 2015*b*: 10)

Ctesiphon had been founded as a Parthian capital on the left bank of the Tigris, opposite Seleucia, and, by the Sasanian period at least, surrounded by fired brick walls and a moat.[11] Located a km north of the late Sasanian royal city of Aspanabr, the site consists of a large mounded area known today as al-Ma'aridh or Tulul Bawi and straddling the mouth of an old canal off-take of the Diyala (Figure 4). This confirms a representation on the arch of Septimius Severus in Rome which indicates that it was divided in two by a canal.[12] Most of the site is now covered by housing and the only archaeological investigations that have taken place there were carried out in 1928/29 and 1931/32,

[5] el Ali 1968/69: 433–34.
[6] Venco 1973/74; 1977.
[7] Cavallero 1966; Negro Ponzi 1966; Venco 1968/69; Venco and Negro Ponzi 1985.
[8] Huff 1996.
[9] Morgan 2003: 333.
[10] Bradford 1957: pl. 24.
[11] Gregory of Nazianzus *Or*., 5.10 P.G. 36.676 B/C.
[12] Gullini 1966: 33.

Figure 3. Aerial view of the round city at Dārābgird (Google Earth, 2010)

revealing a series of large late Sasanian residences near the southern edge.[13]

Merv was another old city which was occupied throughout the Sasanian period and the essentially rectangular layout of its Seleucid foundation remained unchanged as the positions of the main gates effectively fossilised the orientation of the major arteries (Figure 5).[14] In AD 266, Shapur I (AD 242–272) founded a new city in Fars and named it Bay-Shapur ('Excellent [or] Beautiful [city] of Shapur'). Better known today as Bishapur, it measures 1500 x 1000 m across, bounded by fortifications which survive on three sides (the fourth was destroyed by the Shapur river),[15] and apparently divided by major streets into 200 m square blocks with smaller intervening streets (Figure 6).[16] After his sack of Antioch in AD 540, Khusrau I founded another city which was said by al-Dinawari to be located one parasang [4–5 km] south of Ctesiphon and implied by al-Tabari to be on the same, i.e. eastern, side of the river Tigris.[17] It was formally named Veh-as-Antiok-Khusrau ('City Better than Antioch [has] Khusrau [built this]') and is said to have had public baths and a hippodrome; the street plan was modelled on that of Antioch and freedom of worship and burial was given to the Christian inhabitants. Known colloquially as Rumagan ('Town of the Greeks') and later Arabicised as al-Rumiyya, it probably corresponds with the site still known as Bustan Kisra ('Gardens of Khusrau') which is partly destroyed by the Tigris but the surviving portion still surrounded by the eroded remains of high rectilinear mudbrick walls.[18]

Shapur I also founded another city in Susiana called Jundi Shapur ('Military camp of Shapur'). This measured 3.1 km in length, 1.5 km across, is bounded by what

[13] Kröger 1982: 80–136, figs 41, 47, 49.
[14] Simpson 2008*a*: 71.
[15] *contra* Talbot Rice 1935.
[16] See Salles 1939/42: 93, pl. XVII; Amiri and Genito *et al.* 2013.
[17] el Ali 1968/69: 431.
[18] Reuther 1938: 574; Canepa (2018: 67) was influenced by the biased account of John of Ephesus to say that the fortifications, which he misleadingly describes as 'an earth wall', were 'intended to keep the city's thirty thousand residents interned rather than to defend it'. He also regards it as having been a labour camp akin 'to a human zoo' (Canepa 2018: 68). The alternative site identifications made by Adams (1965: 177) and Fiey (1967) are either too far removed or are confused with a second site with the same name.

Figure 4. Aerial view of the site of Ctesiphon (Google Earth, 2016)

Figure 5. View of the ancient city-site of Merv with the citadel of Erk-Kala and the north wall on the right (photograph: author, 1992)

Figure 6. Aerial view of the city-site of Bishapur (Google Earth, 2010)

is now a low gravel bank on three sides and contains low scattered mounds within (Figures 7–8). The site was described by Ghirshman as having 'practically disappeared beneath the plough, but the plan was based on a great rectangle, curiously reminiscent of a Roman military camp. The same arrangement was noticed by the writer at Iwan-i Karkha near Susa, where Shapur II is said to have settled his western prisoners' (Figure 9).[19] Ghirshman published a vertical air photograph of the latter city,[20] carried out a single season of excavations in 1950 and revealed parts of two monumental buildings, one with remains of figural wall-paintings, although few details were published and their precise date unclear.[21] In 1963 a topographic survey was carried out at Jundi Shapur and four small soundings excavated, but the results were regarded as 'uniformly unpromising'.[22] However, two important observations were made. One was that the prominent mounds in the central third of the walled area were composed of re-deposited fill to support early Islamic structures, and the whereabouts and layout of Sasanian structures could not be determined from the surface as these lay below plain level. The second concerned its water supply. Soundings in the bed of the Siah Mansour, a watercourse immediately west of the city, revealed a row of ashlar masonry piers which must have originally supported a bridge, whereas an adjacent tunnel was part of an elaborate inverted siphon which delivered water from a canal off-take from the Dez river, passing under the Siah Mansour and into the city (Figures 10–11).[23] The authors suggested that 'the large grid traceable within the city on the air photographs consist not so much of a rectangular arrangement of streets as a network of such tunnels'.[24] This feature explains how the engineers were able to deliver large and regular amounts of fresh water to the population, and these may have been standard features of Sasanian urban planning as they recur as features within forts and the city-site of Dasht Qal'eh in the Gorgan plain.[25] Despite damage inflicted during the Iran–Iraq war

[19] Ghirshman 1978: 320.
[20] Ghirshman 1978: 179.
[21] Ghirshman 1952: 11–12.
[22] Adams and Hansen 1972: 301.
[23] See Sauer *et al.* 2013: fig. 12: 13.
[24] Adams and Hansen 1972: 301.
[25] Sauer *et al.* 2013: 235–36, 312–18, 387.

Figure 7. Aerial view of the city-site at Jundi Shapur (Google Earth, 2013)

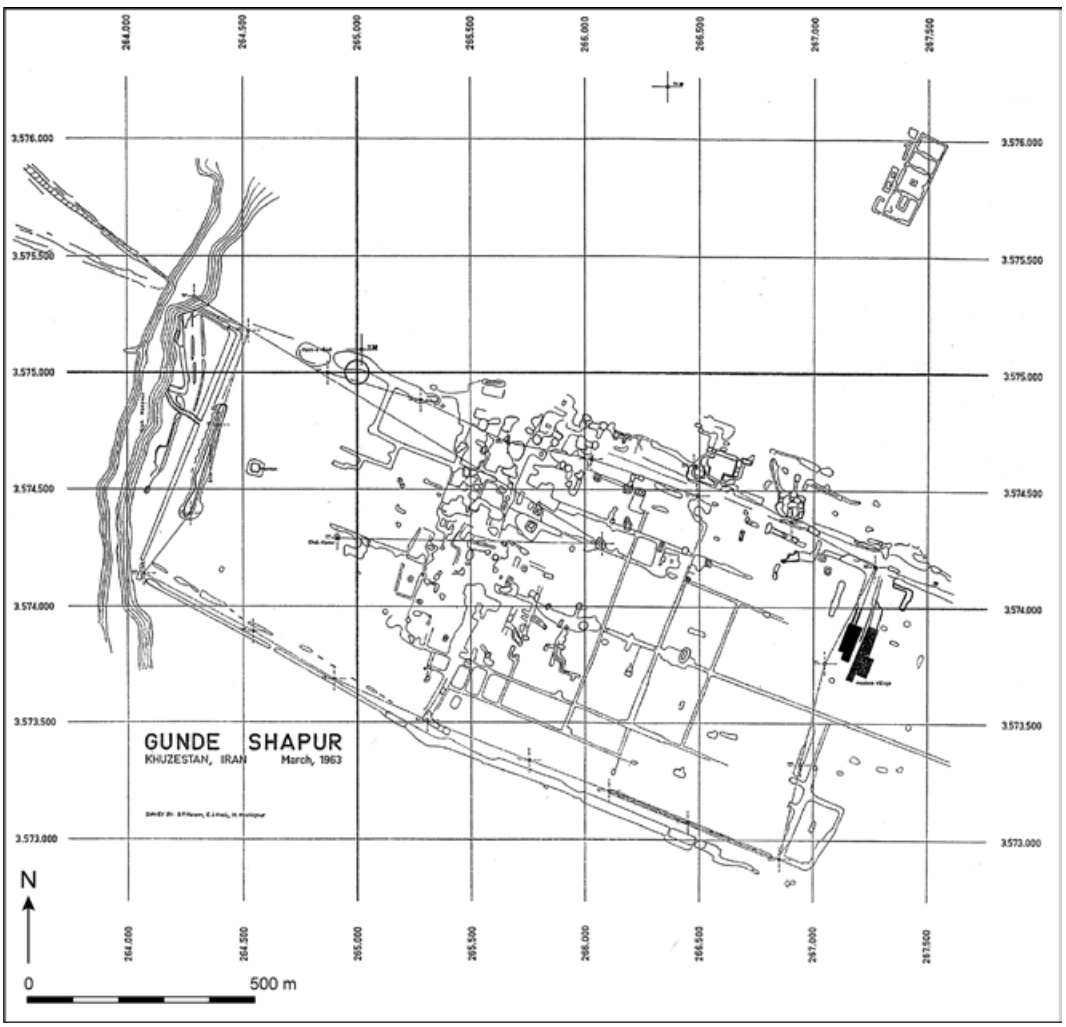

Figure 8. Schematic plan of the remains at Jundi Shapur (after Adams and Hansen 1968: fig. 1)

Figure 9. Aerial view of the city-site at Iwan-i Karkheh (Google Earth, 2012)

and through agriculture and construction, these two city-sites offer great potential in understanding the development of major Sasanian cities.

These are not the only two such cities of this distinctive plan. Following his survey of the Eridu–Ur region of southern Iraq in 1966, Henry Wright commented that:

> 'Visible on the air photographs, which I did not see until after I returned to Baghdad, about eight kilometres west of the survey border is a roughly rectangular walled town, covering 55 hectares and divided into three parts. It is similar in plan to Jundi Shahpur and Iwan-i Karkheh in south-western Iran (Adams 1961, figs. 5, 7) and is probably a Parthian or Sasanian center. Perhaps when the present levee of the Euphrates is examined in detail we will find that EP-65 is one of a series of fortified settlements linked to this larger town, with installations such as al-Qusair being either elements in an outer line of defense or posts designed to protect routes coming from the south'.[26]

Although apparently still not surveyed, the site does indeed appear to be another example of this form of Sasanian urban planning (Figure 12), and many more surprises are likely to lie in store.

Other Sasanian urban centres are attested archaeologically from Iran but almost all remain to be investigated archaeologically. On the Damghan plain, the extensive but heavily water-eroded ruins of the early Parthian capital of Hecatompylos at Shahr-i Qumis continued to be occupied throughout the Sasanian period according to Trinkaus.[27] This

[26] Wright 1981: 335.
[27] Trinkaus 1986: 30.

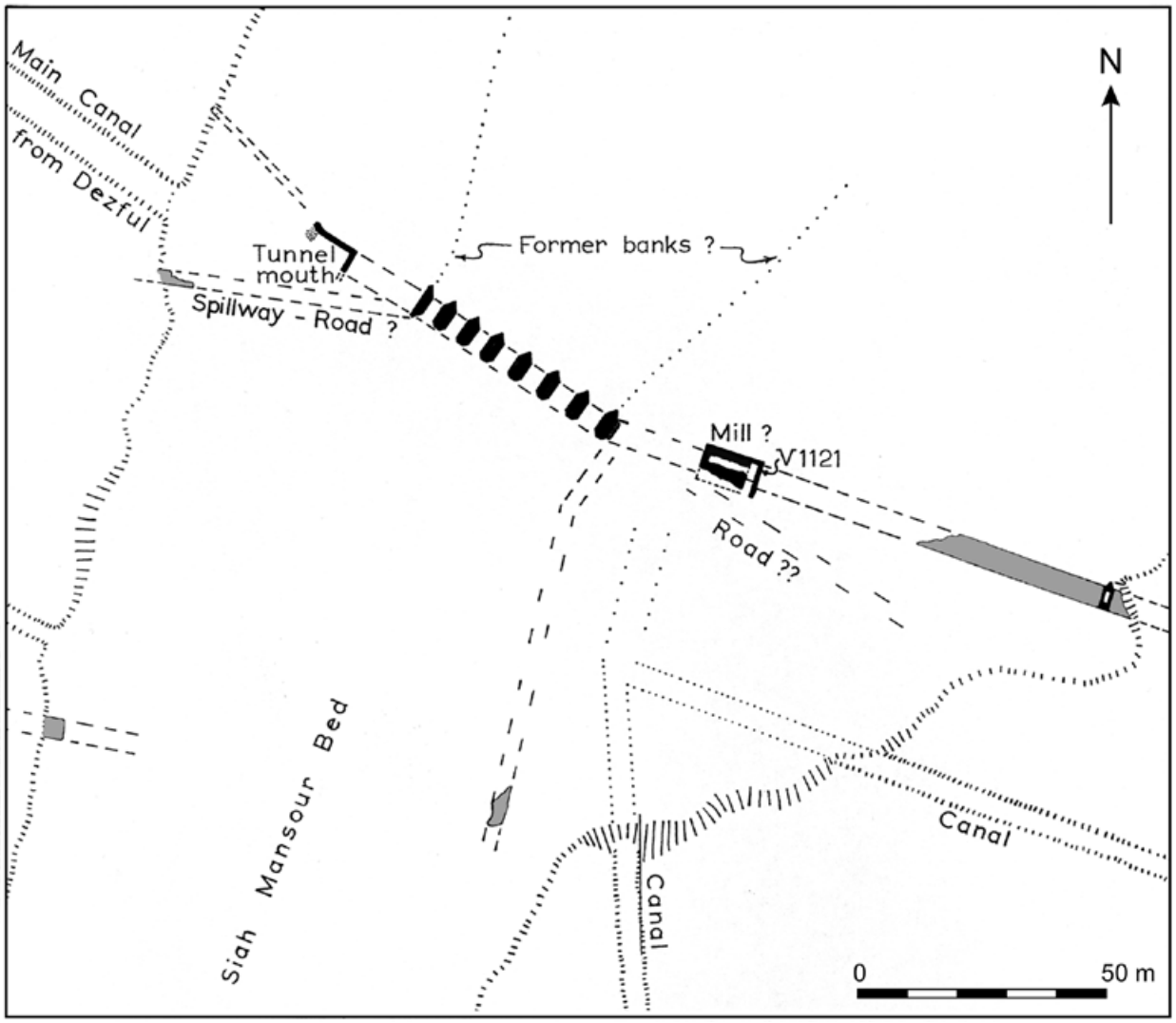

Figure 10. Plan of the inverted siphon supplying fresh water to the city of Jundi Shapur (after Adams and Hansen 1968: fig. 2)

supports Hansman's earlier conclusion that 'a recent and detailed study ... of aerial photographs covering all the Damghan plain produced no other likely site for Sasanian Kōmish'.[28] The fact that Parthian, Sasanian and medieval pottery is concentrated in different areas suggests that the centre of occupation here shifted occasionally, explaining the lack of deep stratigraphy and its currently deflated condition.[29] Observation of satellite imagery suggests that the site is laid out on a grid orientated north-west/south-east, there are substantial unexcavated architectural remains in the north-west part, and much of the gully erosion has a very regular pattern suggesting that it is following the lines of least resistance offered by the main streets. During the same period, a wall appears to have been constructed around the town of Damghan itself, located some 30 km to the north-east.[30] On the Gorgan plain, the city-site of Dasht Qal'eh covers an area of about 3 km^2, therefore exceeding that of Bishapur or Gur, and geophysical survey, followed by test excavation, proved that at least the eastern portion was divided by avenues of brick piers.[31] The unexcavated ruins of an important Sasanian site, 'possibly the position of a considerable military camp', have been noted near the medieval site of Ghubayra, in the Bardsir valley some 70 km south of Kirman, and perhaps this was the source for the Pahlavi-inscribed pottery jar noted by the excavators of Ghubayra itself.[32] Likewise, on the Marv Dasht plain, graves, a pottery kiln, and a stray personal seal found during excavations of the much earlier site of Tal-i Malyan may have been associated with the nearby

[28] Hansman 1968: 138–39.
[29] See Gye *et al.* 1969: 34–35; Hansman and Stronach 1970*a*: 34.
[30] Adle 1993.
[31] Sauer *et al.* 2013: 382–422.
[32] Bivar *et al.* 2000: 3, 177, pl. 431a.

Figure 11. View of the inverted siphon and the piers of the overlying bridge at Jundi Shapur (photograph: author, 2003)

Figure 12. Unsurveyed rectangular anomaly 30 km south-west of Samawah (Google Earth, 2012)

Figure 13. Aerial view of the city-site at Istakhr (Google Earth, 2012)

(unexcavated) Sasanian settlement site of Tal-i Baiza A, which al-Tabari refers to as the seat of a governor of the province of Istakhr during the early part of the reign of Ardashir I.[33] The main population centre on the Marv Dasht plain was Istakhr, and Whitcomb has suggested a plausible difference between the Sasanian (and earlier) and subsequent Islamic parts of the city-site based on different alignments of the streets visible on air photographs;[34] the trial excavations by the University of Chicago in 1932 and 1934 are essentially unpublished but, in any case, were focused on the latter area of the site (Figure 13). The date of foundation of the modern town of Shiraz remains ambiguous and the nearby site of Qasr-i Abu Nasr probably represent its Sasanian forerunner (Figure 14). Excavations there between 1932 and 1935 focused on the prominent citadel, parts of the fortifications and the raised western portion (now destroyed by modern housing), leaving the intervening urban core almost entirely unexplored.[35] In other cases, such as Isfahan, the remains of the Sasanian city attested as a mint lie buried below the modern city,[36] and the equivalent historically attested remains at Rayy and Nishapur remain to be convincingly identified on the ground.[37]

Within the western portion of the Sasanian empire, corresponding largely to present-day Iraq, the results of older excavations also give some glimpses into the continuity of life within some of the old Mesopotamian urban centres. A few, such as Ur, had long since been abandoned as changes in the water-courses left some of these ancient sites stranded and waterless. Uruk is traditionally interpreted in the same manner,[38] but in 1975 a 200 hectare extension of the city measuring 1600 x 1250 m across was discovered immediately to the south-east: it was dated to the late Sasanian period through the presence of torpedo jars, finger-trailed and honeycomb wares, and by comparison of the excavated and surface pottery with material from level III at Tell Abu Sarifa.[39] This implies a deliberate re-foundation of the city on an adjacent spot and probably straddling a new canal, although the exact date of this is uncertain. There is also extensive evidence for late and post-Sasanian occupation at Nippur: Gibson refers to this as

[33] Miri 2009: 9; see Alden 1978; Balcer 1978; Alden *et al.* 2005: 45–46, fig. 4c; Simpson, this volume: 355.
[34] Whitcomb 1979.
[35] Whitcomb 1985.
[36] Cereti 2004; Jung *et al.* 2016: 11; CAIS 2010.
[37] Keall 1979; Rante and Collinet *et al.* 2013.
[38] e.g., Crüsemann, van Ess, Hilgert and Salje (eds) 2013.
[39] Finster and Schmidt 1976: 164–66; Finster 1983; see Simpson, this volume: 273-76.

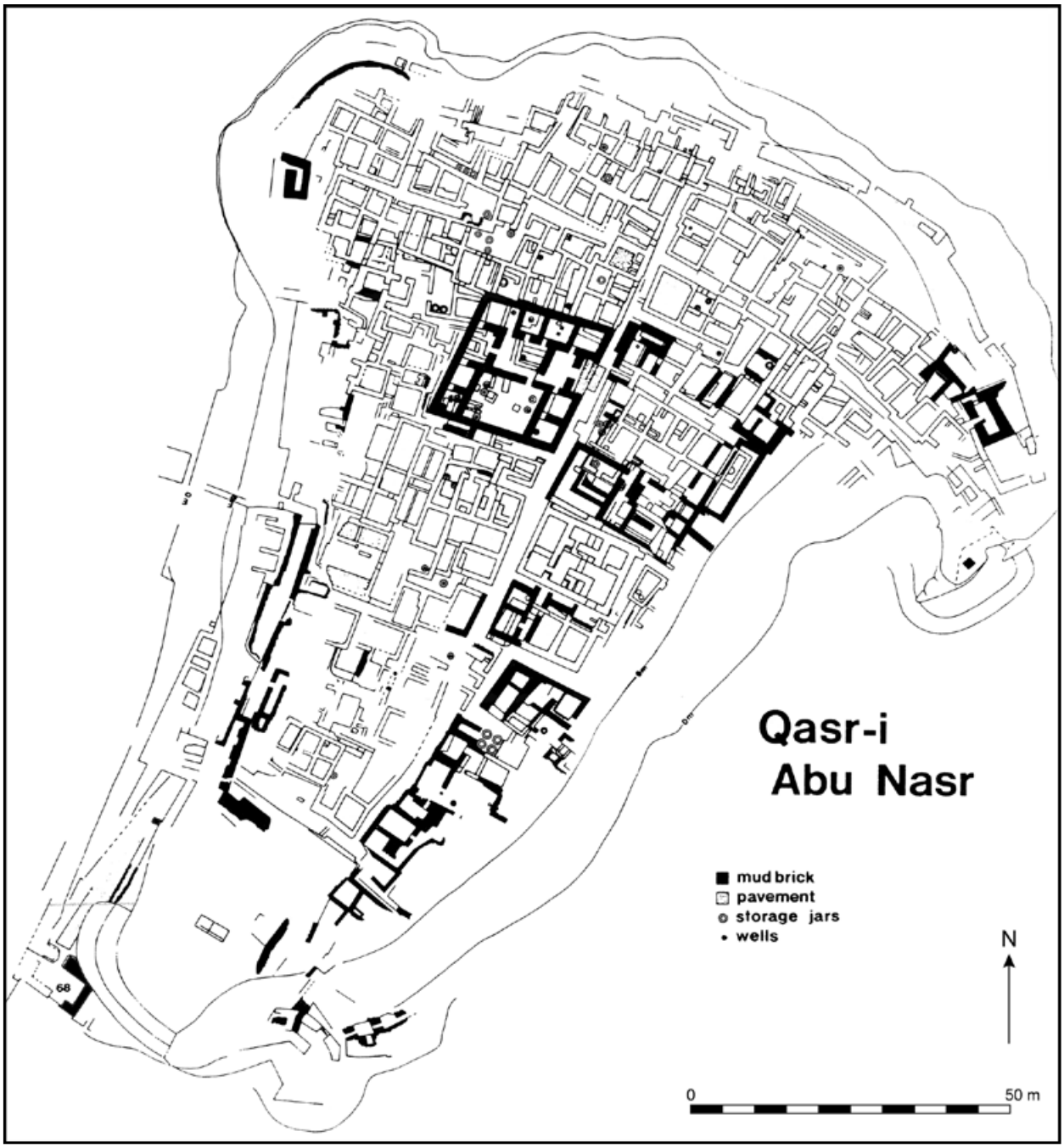

Figure 14. Plan of the latest phases on the citadel at Qasr-i Abu Nasr, marking the excavated wall footings with mudbrick walls marked in solid black (after Whitcomb 1985: fig. 30)

> 'one of its peaks of occupation. The major part of the settlement seems to have been on the West Mound. A string of small tells along the western edge of the city may mark the bed of the most important canal of the time. The old bed of the Euphrates, through the middle of the site, was presumably still used as a canal, however ... The mound called Ishan al-Sahra, south-east of Nippur, was predominantly a Sasanian settlement'.[40]

The excavators found incantation bowls *in situ* in household contexts in the so-called 'Scribal Quarter' mounds, as well as in deflated surface layers there and elsewhere at the site;[41] some of the post-Level I 'late graves' excavated in the same area probably date to this period too.[42] Incantation bowls and surface

[40] Gibson 1992: 52.

[41] Montgomery 1913: 13–14; McCown and Haines 1967: pls 163–67; McCown, Haines and Biggs 1978: pls 76–77.1–3; Gibson *et al.* 1975: 43–44, 117, figs 38.1–4, 89.3–5; Kaufman 1975; Hunter 1994; Faraj and Moriggi 2005: 71–77, pl. I.

[42] McCown and Haines 1967: 73, 118–27.

pottery also point to similar extensive late and post-Sasanian occupation at Kutha (Tell Ibrahim)[43] and areas of Babylon, including Merkes:[44] all three of these centres are named in the Babylonian Talmud, and Babylon is mentioned in the Arab Conquest accounts on account of a strategic fort commanding a crossing of the Euphrates here, most probably to be identified with the square fortress raised on a platform at the site known locally as Babil (Figure 15).[45] The nearby site of Kish offers a slightly different picture with the remains of several elite complexes (described as 'palaces' in the modern literature), some originally decorated with painted stuccoes and which partly resemble the plan of similar-sized complexes at Chal Tarkhan and Damghan, and situated close to a sprawling area of residential occupation (Figure 16).[46] Moving northwards, the 2nd millennium BC site of Nuzi, near Kirkuk, was re-occupied at this period, with a cemetery located on the elevated early mound in the centre of an extensive settlement which appears to date between the 5th and early 7th centuries judging by the associated pottery (Figure 17).[47] Finally, the site of Nineveh provides clear evidence for continuity of occupation on the former Assyrian citadel of Kuyunjik, extending from the Seleucid to the medieval period and including evidence for a post-Sasanian church.[48] Unfortunately, in none of these cases, is there evidence for how the settlements were organised, and modern excavations of this final period of occupation at any one of these old Mesopotamian urban centres is long overdue.

The success or otherwise of Sasanian urban planning can be gauged by how long these cities were occupied for. In many cases, there is insufficient evidence to indicate how long they continued after the Islamic Conquest but others, such as Bishapur, Istakhr, Merv and some of the older Mesopotamian towns, certainly thrived for several centuries thereafter and were only gradually abandoned as their populations drifted to nearby centres of power and patronage. It is important to recognise that this continuity of population must have had a strong effect on the transmission of knowledge and culture, as discussed in greater depth below.

Rural and maritime landscapes

> 'enough remains to indicate that virtually the entire cultivable area was brought under the plow and commanded by a vast network of new canals. The construction of these canals seems to adumbrate a new and radically different outlook. They imply the engineering competence to plan, and the political and financial power to execute, a fundamental reshaping of the landscape and its water resources in the endeavour further to enlarge and stabilize the revenues of the state'.[49]

This observation of sites in the Diyala basin in east central Iraq is mirrored across many other regions of the Sasanian empire. Cities need feeding and they cannot exist without efficient transport systems and supply networks. The immediate hinterlands of most highland Iranian cities were relatively small and confined to their immediately surrounding intermontane valley or plain, and the symbiosis of city and countryside is encapsulated by the layout of Gur where the radiating layout of the urban streets extends outwards into the field alignments beyond the fortifications.[50] However, valleys connect and each micro-region is linked with the next. There is currently rather limited evidence for Sasanian rural settlement patterns across Iran but this is probably a misleading impression. The Damghan plain was intensively surveyed in 1976/77 by K.M. Trinkaus and the results suggest that there was much more extensive settlement in this period, compared to the preceding Parthian period, that there was an increase in the number of open sites but these were more widely dispersed, and during the late Sasanian period settlement appears to have moved to the fringes of the plain.[51] This change in settlement pattern suggests a transformation in the management of the primary alluvial zone and consistent with land reforms. Juridical references to the foundation and maintenance of qanats prove that this form of agriculture and water-supply was important in some regions, particularly arid areas where measures to capture episodic run-off or to tap springs have formed the basis of agricultural activity for millennia.[52] Surveys in the Kur river basin point to a significant increase in settlement along the main routes and irrigation agriculture during this period.[53] Moreover, within the Behbehan plain, located midway between the plateau and Susiana, a survey carried out in 1970 indicated that the densest periods of settlement were in the 5th millennium BC and Sasanian-Islamic periods.[54] It is likely that regions such as the Gorgan plain were extensively settled although attention there so far has focused either on earlier sites or the region's military and hydraulic infrastructure during the

[43] Reade 1986: 112–13.
[44] Koldewey 1914: 248, 251–52, figs 162, 168; see Hunter 2000*a*.
[45] Schmidt 1941: 821–22, fig. 17; Wetzel, Schmidt and Mallwitz 1957: 24–25, pl. 13; Gibson 1972: 149 = Kish Survey Site 127; see Morony 1982: 26.
[46] Harden 1934; Gibson 1972: 77–78, 113; Moorey 1978: 122–46; see below.
[47] Simpson 2013*a*; see Ehrich 1939.
[48] Simpson 1996*a*; 2005*b*.
[49] Adams 1965: 82–83.
[50] Huff 1974: 159.
[51] Trinkaus 1981; 1983; 1984; 1986.
[52] De Menasce 1966; Wilkinson *et al.* 2012: 168; see Moghaddam and Miri 2007: 50.
[53] Hartnell 2014.
[54] Dittmann 1984: 103–16, map 1.

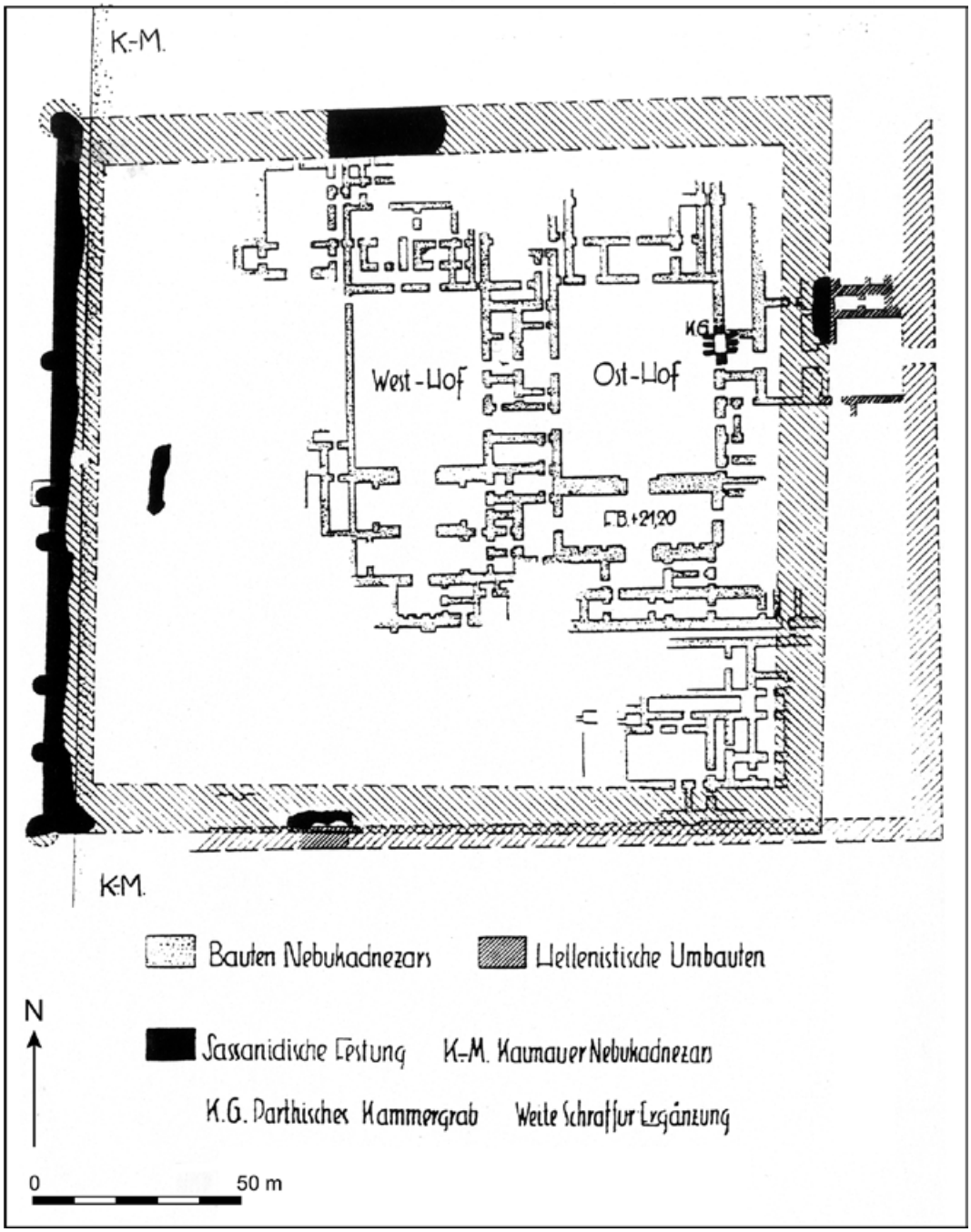

Figure 15. Plan of the excavated Partho-Sasanian fortress at Babil (after Schmidt 1941: fig. 17)

Sasanian period.[55] Elsewhere on the plateau, the wider settlement context of important sanctuaries such as Ganzak (Takht-i Suleiman), or forts such as Haftavan Tepe in the Urmia basin and that on the summit of Tepe Yahya (Level IA) in the Soghun valley of south-east Iran, remain uncertain.

The more extensive lowland plains and deltaic fans offered greater opportunities for massive development, and this is clear at both ends of the empire, from Mesopotamia and Susiana in the south-west to Gorgan and Margiana in the north-east. Efficient and intensive agriculture, coupled with waterborne transport and communication in the case of lower Mesopotamia, were keys to the success of the urban landscape. One of the greatest contributions of archaeology to the understanding of the organisation of the Sasanian economy lie in the results of surface surveys carried out in the Mesopotamian lowlands between 1953 and 1975. These prove that there was massive investment in the regional hydraulic infrastructure designed to sustain intensive year-round agriculture and institute

[55] Sauer *et al.* 2013.

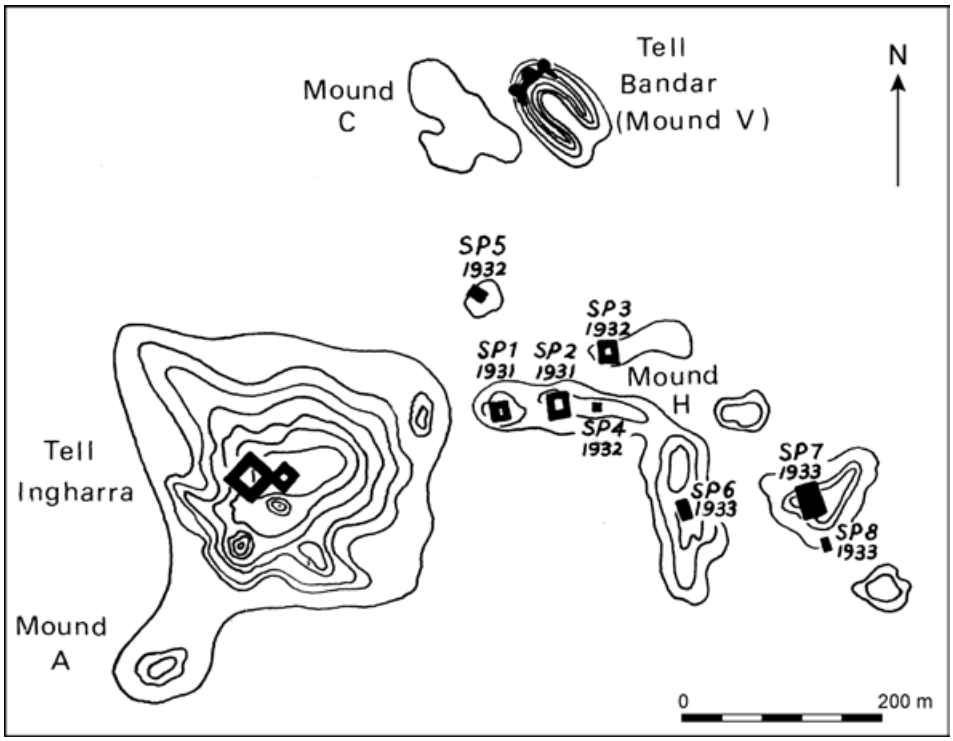

Figure 16. Plan showing the relative locations of the excavated Sasanian buildings and other areas of occupation at Kish (after Moorey 1978: fig. J)

Figure 17. Plan of the site of Nuzi, the areas excavated indicated by the tone and the position of the early Sasanian cemetery on the north-west summit of the highest mound in the centre (after Starr 1937: vol. II, plans 2, 39)

an improved and closely integrated water transport system.

The first important archaeological survey within the wide area covered by the Sasanian empire was begun in the Diyala region of east-central Iraq in 1936/37. Initiated by the Sumerologist Thorkild Jacobsen, it rapidly demonstrated that the earliest periods of settlement were heavily masked by alluvial silt, whereas the most significant late period of occupation corresponded to the Sasanian period and this was characterised by large-scale water-engineering projects involving canals and regulators.[56] The results were developed and published in greater detail by Adams, and the principle of archaeological survey and use of diagnostic pottery types (so-called 'type fossils') to date sites was extended by him and others across large areas of central and southern Iraq and the Susiana plain of south-west Iran between 1956 and 1975.[57] Adams later admitted that 'in the northernmost part of the plain the exceptionally numerous and massive sites of the later periods were for the most part not recorded' on the 1956/57 survey.[58] Increasing attention was paid on later surveys to these late periods and a slightly refined chronology developed: thus Gibson's more intensive survey of some 2000 sq km around Kish contradicts the results of Adams' Akkad Survey (although they were published together in 1972) and suggests a Sasanian, rather than Parthian, date for an increase in both settlement density and settlement size.[59]

Irrespective of their individual inconsistencies, these different surveys concur in demonstrating that the extent of Sasanian engineering works was huge: not only were the Tigris and Euphrates systems combined for the first time, but the Greater and Lesser Zab and Adheim rivers were also controlled and diverted into canal off-takes. The beginning of this integrated water management system therefore lies considerably further north than previously recognised (Figure 18). A series of canal off-takes above and below the Sasanian town of Mahoza dh^{e} Ariwan (present Tell Mahuz) on the left bank of the Lesser Zab were used to divert flow via the 'Abbassi and Fil canals into the Adheim river system. The purpose of this appears to have been to increase water supply south of the Jabal Hamrin rather than for local irrigation purposes.[60] Moreover, additional large-scale water engineering works were undertaken along the middle Tigris with the cutting of a series of canal off-takes through Pleistocene (or older) conglomerate terraces on the left bank of the river Tigris. The primary purpose of these feeders was to increase water supplies in the alluvial plains downstream: as the middle Tigris possesses a steeper gradient than further south, canals drawn off at this point maintained a relatively higher level of water downstream and enabled secondary canals to divert supplies for irrigation. The first of these begins opposite modern Baiji, north of Tekrit, and stretches 62 km to join the Nahr al-Rasasi (Qatul al-a'la al-Kisrawi). A square palace measuring 250 m across with a central pool lies next to the junction and may be late Sasanian in date, and; the Sasanian town of Karkh Fairuz lies nearby (Figure 19).[61] Further south, the Nahr al-Rasasi was joined by further off-takes, the Nahr al-Qaim and Nahr al-'Ibra. Near the beginning of the first of these lies the remains of a Sasanian solid block tower, the Burj al-Qaim, which may represent a commemorative monument or fire signal station (Figure 20);[62] Ammianus refers to such a construction at the Euphrates mouth of the Nahar Malcha ('Royal Canal'), which he describes as 'a tower of considerable height ... like the Pharos',[63] and another, 'from which the new moon used to be announced', is described in the Babylonian Talmud as located at Biram near present-day Falluja.[64] To the east, the Nahr al-Rasasi cuts across the southern end of the river Adheim and diverted its waterload into the Diyala and Nahrawan systems south of Baquba. Further evidence for the new degree of control placed on the natural drainage is indicated by the construction of a barrage and regulator on the Adheim at the point where it broke through the Jabal Adheim (Figure 21).[65] The same feature was used at the point where the Diyala river breaks through the Jabal Hamrin.[66] The purpose of this regulator was mainly to control the quantity of water entering the Qatul al-Kisrawi and Nahrawan canal systems during spring peak flow but also to deflect water into canal off-takes on the right bank of the Adheim. It might be added that the fan-like distribution of these suggests that a high density of rural settlement is to be expected here when the area is properly surveyed, and would explain references to Arab pastoralists being cleared from this section of valley in favour of arable agriculture.[67] In addition to placing greater control over water supply, these canals must have facilitated transport both by water and along their banks (Figure 22).

The region on the opposite, right, bank of the Tigris appears to have been dominated by pastoralist tribes and, during the 3rd century, members of the Qudā'a tribe are said to have spent their winters here until they were later moved to the Hira region.[68] A century later,

[56] Jacobsen 1954; Jacobsen and Adams 1958.
[57] Adams 1962*a*; 1965; 1972; 1981; 2006; Adams and Nissen 1972; Gibson 1972; Wenke 1975/76.
[58] Adams 1981: 206.
[59] Gibson 1972: 51–52; see Adams 1965: 70; 1972: 187–88.
[60] Ionides 1938; see also Reade 1978: 172–75, figs 1–2.
[61] Northedge 1987.
[62] Herzfeld 1924; 1948: 7.
[63] Ammianus, *History* 24.2.7.
[64] Oppenheimer 1983: 96–97.
[65] Jones 1857: 121–22 and facing illustrations; Sulaiman 2011: 385–87, pl. XXX.
[66] Adams 1965: 76.
[67] See Adams 1965: 78, fig. 7.
[68] Morony 1984: 215.

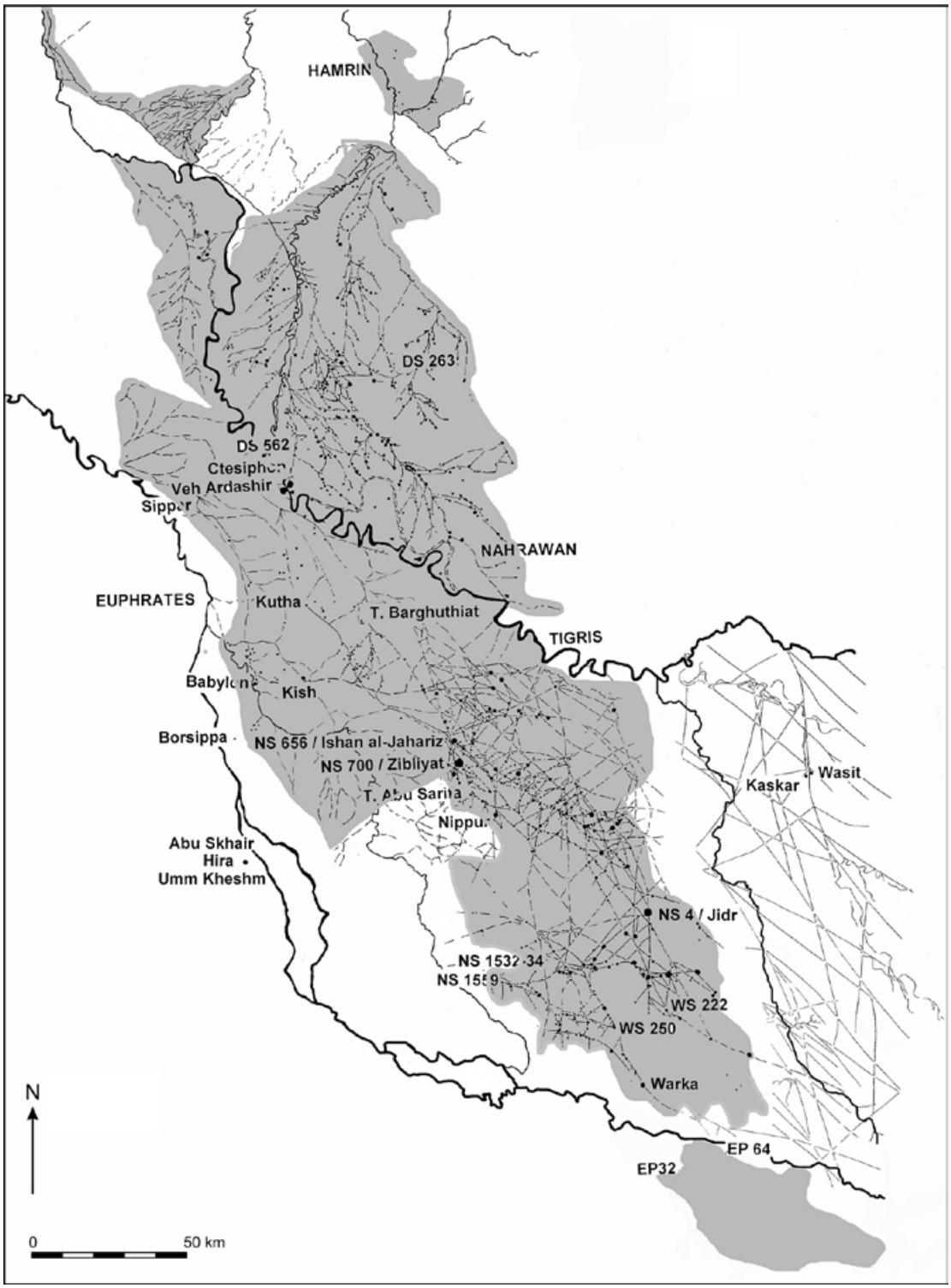

Figure 18. Plan showing the reconstructed extent of Sasanian sites and canals in central and southern Iraq, the extent of the published archaeological surveys being indicated by the toned areas (after Simpson 2015*b*: 19)

the Iyad ibn Nizar occupied the area but were killed, re-settled and/or driven over the Roman frontier during the reign of Shapur II; further re-settlement of this tribe occurred at Tekrit under the reign of Khusrau I when they are described as possessing herds of camels and mixed flocks of sheep and goats.[69] A desire to control the movement of such tribes from the south Jazira into the irrigated zone further south may have

[69] Morony 1984: 216.

Figure 19. View of the fortifications around the Sasanian town at Karkh Fairuz near Samarra (photograph: A. Northedge, 1983)

motivated the possible early Sasanian construction of a long wall known today as el-Mutabbaq, which stretches for at least 10 km into the steppe from the right bank of the Tigris opposite Samarra (Figure 23). This was constructed as a solid casemate with packed gravel infilling and a mudbrick face on both sides, regular projecting semi-circular towers on the outer, western, face and a 20–30 m wide ditch along the front (Figure 24).[70] In terms of construction it resembles the Gorgan and Tammisheh Walls, as well as the walls around Gur and Iwan-i Karkheh, but with the addition of towers.[71] Traces of an equivalent construction known as Umm Rus have been noted in the middle Euphrates area and this may be the same as the 'half-destroyed traces of walls' reported by Ammianus in the mid-4th century: 'these in early times had a wide extent, it was said, and protected Assyria from hostile inroads'.[72]

The Diyala basin fell within the late Sasanian administrative province of Khusrau Shadh Qubadh or Shadh Hormizd and was administered from Ctesiphon. The Qatul al-Kisrawi/Nahrawan canal system drawing water from the middle Tigris and Adheim was a major physical feature which linked shorter stretches of earlier canal in the lower Diyala basin. Joined by further off-takes from the upper Diyala, the aim of this trunk canal was to increase the quantity, reliability and regularity of water supplies in the lower Diyala and adjoining reaches of the Tigris. The latter were in turn linked by canals to the plains further south. The effect was to

Figure 20. View of the Sasanian block tower at Burj al-Qaim (photograph: A. Northedge, 1983)

[70] Reade 1964.
[71] Nokandeh *et al.*, this volume.
[72] Ammianus, *History* 24.2.6.

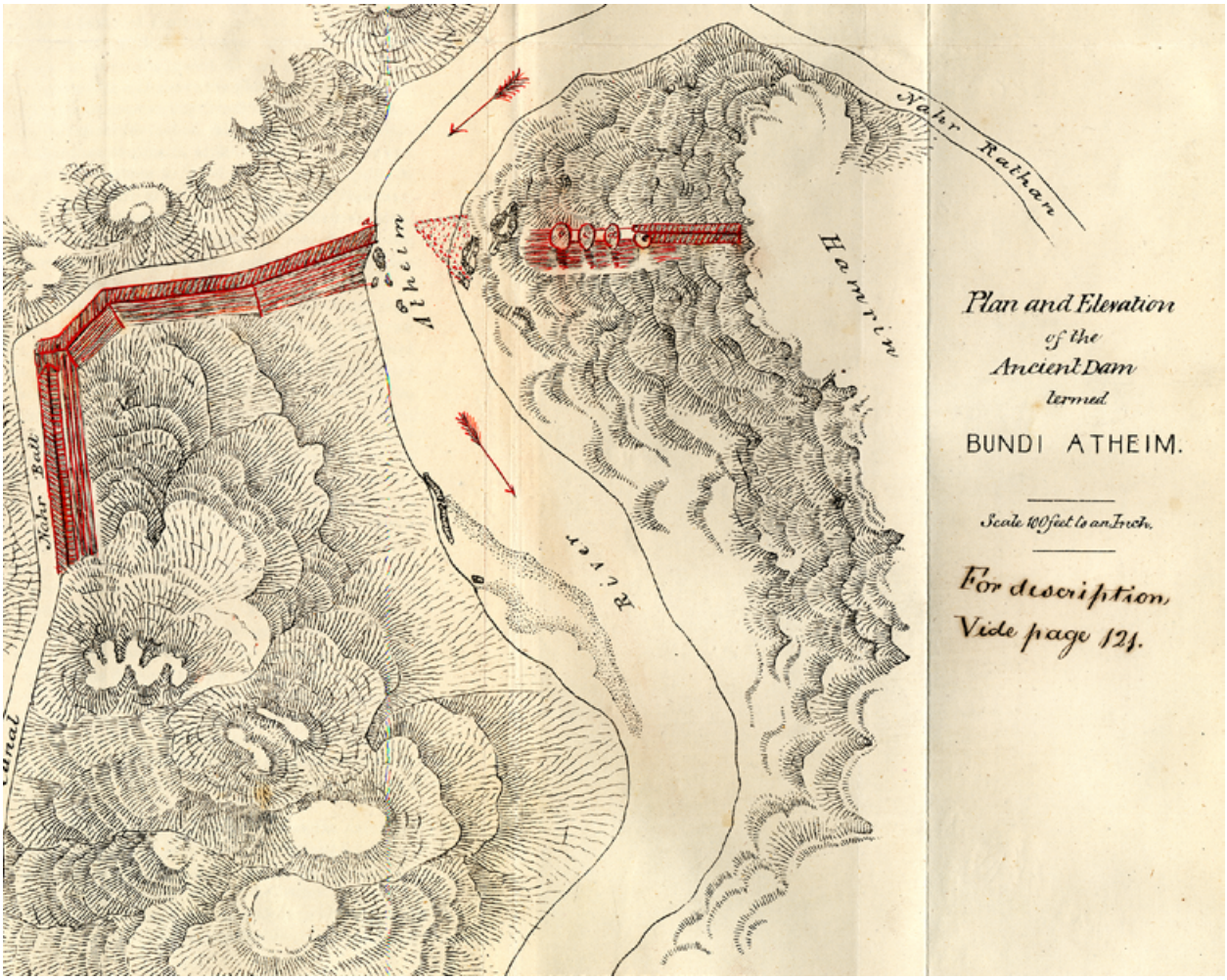

Figure 21. Plan of a Sasanian regulator at Adheim (after Jones 1857: fig. 10)

Figure 22. Modern canal near al-Mada'in in southern Iraq (photograph: author, 2016)

Figure 23. Aerial view of the Sasanian long wall known as el-Mutabbaq (Google Earth, 2013)

sustain a further increase in agriculture (attaining the maximum possible in the Diyala), settlement density and size of urban centres. The Sasanian period thus sees a continuation of trends, beginning in the Seleucid and Parthian periods, which were associated with the development of agriculture and infrastructure in the immediate hinterland of the new Tigris capitals of Seleucia and then Ctesiphon, and reflects the growing importance of this route into western Iran. A characteristic of Sasanian settlement here, and further south, was a tendency for low sprawling ribbon development alongside the waterways but these also doubled as arterial routes and potentially defensible water features. During the Sasanian period, Ctesiphon increasingly resembled a conurbation of cities, both old and new, explaining the respective Aramaic and Arabic terms of Mahoze and al-Mada'in ('the cities').[73]

East of the Diyala, the Mandali–Badra area was briefly surveyed in 1966.[74] A Sasanian 'monumental building' is suspected at Tell Kusakh, the largest of a group of mounds clustered along a wadi leading off the Ab-i Naft, and Partho-Sasanian occupation is also reported at Qalat Sefid, immediately south of Mandali, and Tell al-'Aqar near Badra.[75] It seems likely that this area sustained a high population in Sasanian and early Islamic times with hill-slope runoff being utilised for natural flow irrigation.[76] This would not only match the situation documented in greater detail for the Deh Luran plain further east,[77] but also explain the high density of Sasanian sites recorded on Iranian surveys of the intervening Mehran plain.[78] Nevertheless, the close similarity in the plan of a late Sasanian courtyard house excavated by the Italian archaeological expedition to Iraq at Tell Mahmud in the Hamrin basin[79] with those mapped on the surface in the Deh Luran reinforces the impression that these may even have been part of the same phase of rural development,[80] and the analysis of the zooarchaeological remains from Tell Mahmud gives an important insight into the equivalent environmental remains .[81]

[73] Simpson 1997*a*; Negro Ponzi 2005*a*; Hauser 2007*b*.
[74] Oates 1968.
[75] Oates 1966: 54, fig. 2; Hrouda 1973.
[76] See Dowson 1921: 20.
[77] Neely, this volume.
[78] Zeidi 2012; see Nokandeh 2010.
[79] Invernizzi 1980: fig. B.
[80] Neely, this volume.
[81] Fedele, this volume.

Figure 24. View of the unexcavated Sasanian long wall at el-Mutabbaq (photograph: H. Abdulrasool)

South of the so-called Hit–Samarra line between the Tigris and Euphrates, these rivers finally break free of their incised valleys and enter the alluvial plains of lower Mesopotamia. The rivers deposit most of their silt load at this point as the velocity of the water decreases accordingly. One estimate suggests that, prior to the heavy damming of both rivers in recent decades, the Tigris alone was responsible for dumping three million tons of silt a day during the peak discharge months of April and May.[82] The bed of the Euphrates is some 9 m higher than that of the Tigris between Baghdad and Ramadi – where the rivers come within 40 km of each other – and for this reason canals cut across from the Euphrates enable gravity flow irrigation across the northern part of the alluvium.

The Mesopotamian alluvial plains correspond partly to the early Sasanian province of Asoristan (later Arab Sawad), but were divided in late Sasanian times into the provinces of Ard Babil, Ard Kaskar, and Ard Maysan.[83] The first of these was eventually divided into four smaller provinces: Peroz-Shapur (after the city of the same name on the middle Euphrates, modern Falluja), Veh Ardashir (stretching from that city opposite Ctesiphon to Kutha), Veh Kavad (further south along the Babylon branch of the Euphrates) and az-Zawabi (on the Tigris near Nu'maniyya). To the south, Ard Kaskar was created as a province from the northern portion of the former kingdom of Characene and stretched from Veh Kavad/az-Zawabi in the north-west and west to the western channel of the Tigris. It was divided into two districts based on the Shatt an-Nil (to the west) and Tigris, the former administered from the city of az-Zandaward (possibly the 230 hectare site of Tell Jidr) and the latter from Kaskar (opposite the Islamic conquest foundation of Wasit). The region further south was the province of Ard Maysan, formed from southern Characene and Mesene, and centred on the cities of Astarabadh Ardashir (former Charax Spasinu, modern Naisan) and Bahman Ardashir (Pratta, modern Maghlub), both situated on the eastern or Madhar branch of the Tigris and largely submerged under the alluvium.[84] Under the terms of the late Sasanian administrative quadripartite division of the empire, Ard Maysan was part of the so-called 'Quadrant of the South' which was centred on Fars and included the Persian Gulf, and this suggests that its economic orientation was re-orientated accordingly. The fact that two other cities are attested here, namely Apamea near Fam al-Silh and Shadh Shapur (founded by Shapur II), as well as the port at Ubulla (previously known as Apologos, later replaced by Old Basra), indicates that Ard Maysan was a flourishing province.[85]

Systematic archaeological surveys only cover the equivalent of one of these three provinces, namely Ard Babil, and even this has neither been fully surveyed nor covered to the same level of intensity. Nevertheless, the results clearly demonstrate that this region was covered by a complex and fully integrated network of canals during this period. A series of canals traversed the northern portion and connected the Euphrates with the Tigris. Near the site of Tell Nihar (possibly Talmudic Nehardea), a trunk canal ran south-east from the Euphrates down to Tell Jidr. This precursor of the later Shatt an-Nil was paralleled by two further canals,

[82] Buringh 1957.
[83] Morony 1982.
[84] See Moon *et al.* 2016.
[85] Simpson 2019*b*.

located 6–7 km to the east and west respectively, which ran for some 85 km between Ishan al-Jihariz (a 72 hectare site) and Jidr. The site of Zibliyat (160 hectares) lies near the northern end of the easterly of these two canals, whereas Jidr itself is described as:

> 'a very large and long-lived ancient town, whose full importance has yet to be recognized ... Nearest the center is a steeply elevated citadel (?) 200 m. in diameter. Numerous yellowish baked bricks (34 x 34 x 7 cm) here bear a stamped impression of trifurcating wavy lines, for both of which a Sassanian date seems probable. Immediately south-west of the citadel is a square mound, 200 m along each side and with corners oriented to cardinal directions, that rises almost to [the] same height. Here there are bricks of same dimensions (but without stamp), and much mortar'.[86]

The location of these major urban centres is clearly closely related to the design of this portion of the canal system. Upstream of Ishan al-Jihariz, a fan of further canal off-takes implies the existence of major weirs and regulators. Additional traces of waterworks with fired brick construction have been noted at several other sites.[87] Adams concluded that

> 'the countryside for a long distance to the south is divided into north–south strips by a fairly regular network of parallel, unusually straight and hence carefully laid out branch canals. At intervals these are intersected by other canals, either at right angles or along diagonals, whose uniformity of orientation again indicates that they were laid out according to a large-scale, carefully surveyed plan. The effect was to open up a very large new area for cultivation by dividing it into polygons of varying size, principally rectangles, trapezoids, and triangles of from as little as 20 or 30 to 1,000 or more hectares'.[88]

The largest number of settlements across this zone belonged to village-sized settlements of ten hectares or less. However, the frequency and exceptionally large size of urban centres resulted in these villages totalling only some 42% of the total settled area according to Adams.[89] Only one small settlement of this period has been excavated within this region, namely Tell Abu Sarifa, where excavations in Levels II and III revealed the remains of regularly aligned mudbrick walls which were dated to the 6th century and earlier, mainly on the basis of two incantation bowls found in Level III (Figure 25).[90] The majority of these villages appear to have been unwalled, judging by the amorphous shapes of the mounds, and this probably contributed to dynamic shifting settlement, as has been noted at Zibliyat where the 9th century pottery was noted closest to a prominent tower where dessicated reeds surviving within the brickwork enabled radiocarbon dating to *c.* AD 880.[91] The same type of settlement organisation applies to some of the much older towns, such as Babylon, Borsippa, Kutha, Nippur and Warka (see above). The continuity and conservatism of population at these might also explain the frequency of Babylonian magic bowls at many of these sites.[92] Contrasting with these settlements are a series of fortified new towns which appear to have been founded as part of the agrarian re-organisation. These include the sites of Tell ad-Dhiba'i (Medina), Ruqbat al-Mada'in (Figures 26–27), and Jidr. Adams and Nissen suggest these functioned as military strongholds,[93] but their central locations and proximity to major canal junctions suggest they were also centres of local administration and industry, and the walls themselves may have been to denote status as well as defence. However, some other sites may have had a more explicitly military or police function and are characterised by being raised on artificial platforms (Nippur Survey site 716, Warka Survey sites 164, 170), whereas others appear to have functioned as watch-towers (Tell Shahal, Ishan al-Turmma).

The extent of ancient permanent settlement east of the present western course of the Tigris (which effectively marks the eastern limit of modern archaeological surveys) is uncertain and, for the Sasanian period at least, has provoked some controversy as it has been regarded as being part of the marshes or 'Great Swamp'.[94] The extremely shallow gradient of the alluvium at this point renders it very susceptible to seasonal or permanent flooding if the river or canal banks are breached, particularly when combined with raised sea-level and/or temporary tectonic down-faulting. Prior to the large-scale draining at the end of the last century, the marshes offered rich fish, bird and reed resources, the narrow strips of raised land alongside the waterways were well suited to the cultivation of date palms, salt-tolerant barley and rice, and there was good grazing potential. Ironically, rather than representing a region of poor agricultural resources, the marshes therefore offered an unusually high diversity of minor eco-zones which were capable of sustaining small secluded communities, as well as larger population centres on the main river channels. However, the Arab accounts suggest that this was not always the case. Ibn Rustah states that 'before Islam' ships from India could travel as far as Ctesiphon along

[86] Adams and Nissen 1972: 219.
[87] Adams 1981: 256, 258, 273, 279, 290 = Nippur Survey sites 612, 686, 1121, 1280, 1572.
[88] Adams 1981: 210.
[89] Adams 1981.
[90] Adams 1970.
[91] Burleigh 1980.
[92] Scotten, this volume.
[93] Adams and Nissen 1972: 62.
[94] e.g., Adams 1981: 205; see Hritz, Pournelle and Smith 2012; Verkinderen 2015.

the present eastern course of the Tigris but, according to Yaqut, this channel was blocked in the 5th century by Varahran V (AD 421–439) as part of a project to add water supply to the western Tigris channel. This is consistent with development of the province of Kaskar and suggests that the water was required for new field systems on freshly drained land east of Warka. Al-Baladhuri states that there had been flooding of this area but the land was restored by Kavad I (AD 488–496, 499–531), until the area became flooded again in *c.* AD 627–629 – doubtless following lack of resources after the wars of Khusrau II and the political instability which followed – and the area turned to marsh.

Conclusion

A mixture of continuity and change runs through the Sasanian legacy to their Islamic successors. In some regions there appears to have been a collapse in settlement but how far these reflect economic, military or other causes is unclear, and a combination is likely. In some cases the appearance may also be misleading as the dating of the sites in question relies on good control of the pottery types present and, unless these are specified and/or quantified, questions remain over the precision of their original dating.

Despite the length and scale of previous archaeological investigations, large areas of Iraq still remain almost entirely unsurveyed. For present purposes, these include the entire region between the Hamrin basin and Nineveh, the levees along the Tigris and Euphrates and the large region corresponding to the Sasanian province of Ard Kaskar. Moreover, the quality of survey for Sasanian sites north of Kish is very weak, and the methodology of survey which was based on vehicular transects led to an under-representation of low-lying sites, whether small or large. Nevertheless, the results suggest that the destructive effects of Julian's AD 363 campaign have been over-emphasised,[95] as has the extent of the marshes which at one point were even considered to extend as far north as Kufa/Najaf and Hilla.[96] Moreover, the surveys also contradict a suggestion that 'the urbanisation project in south-west Iran and Mesopotamia brought about a decline in rural settlement and migration to the cities'.[97] In this case urban and rural growth went hand in hand as each relied on and stimulated the other, and Adams correctly concluded that this period 'was the apogee of the ancient settlement and irrigation record in every respect'.[98] There is similar evidence from Khuzestan,[99] the Susiana plain[100] and the Deh Luran,[101] although the dating of the associated sites requires more precision. Moreover, it was during this period that Bushehr and its immediate hinterland also saw intensive settlement,[102] and the discovery of large number of ossuaries containing secondary burials proves that a large proportion of the population were Zoroastrian.[103] The results of more recent surveys in the Kur river basin of northern Fars and small valleys north of the Persian Gulf between Bushehr and Siraf suggest a similar intensification in

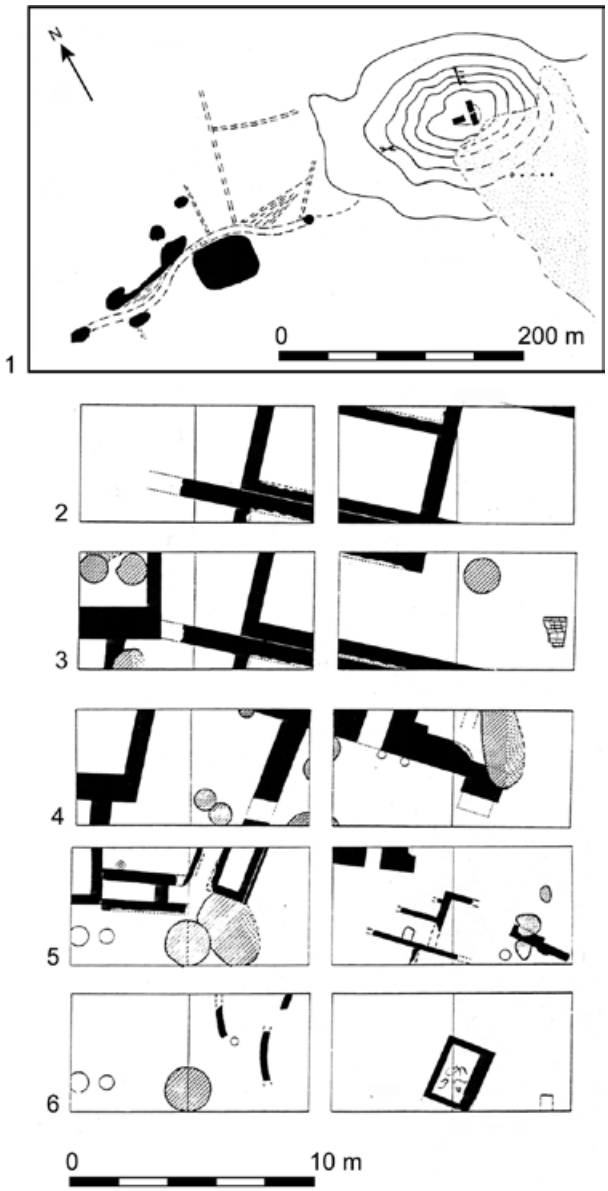

Figure 25. General plan of Tell Abu Sarifa (1) and the architectural remains excavated in Levels II–VI (2–6) (after Adams 1970: figs 1, 3)

[95] See Matthews 1989.
[96] Le Strange 1905: 40–43, map II; Obermeyer 1929: 97; Adams 1981: 180, 205.
[97] Mousavi and Daryaee 2012: 1078.
[98] Adams 1981: 252.
[99] Adams 1962*a*; 1962*b*; Eqbal 1976: 116, table 20, fig. 49; Walstra, Heyvaert and Verkinderen 2010; cf. Moghaddam and Miri 2007: 48–52.
[100] Wenke 1975/76; Moghaddam and Miri 2003: 103–105.
[101] Neely 1974; this volume.
[102] Carter *et al.* 2006.
[103] Simpson and Molleson 2014; Simpson 2019*c*.

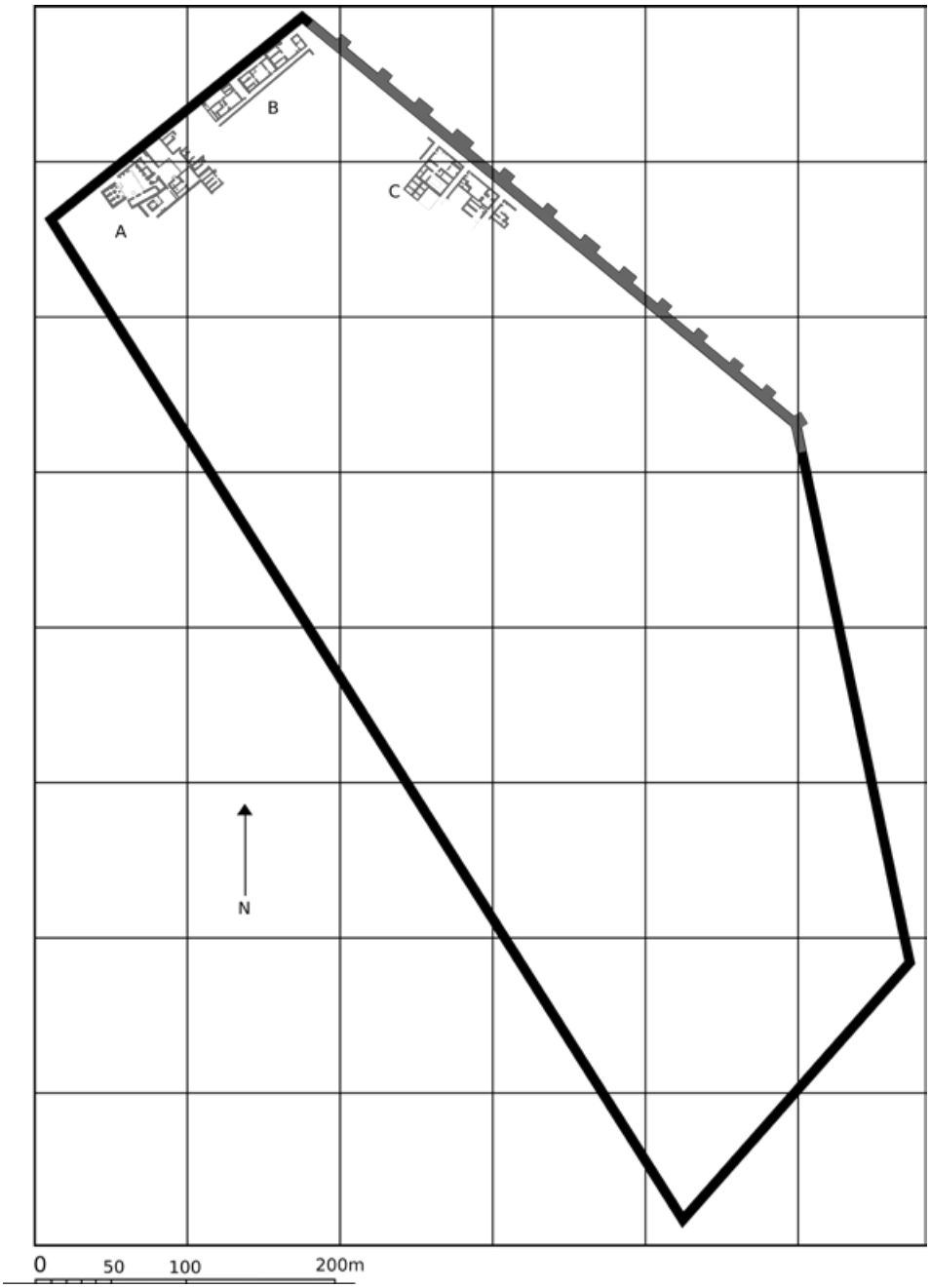

Figure 26. Plan of Ruqbat al-Mada'in with architecture visible on the surface mapped in three areas at the northern end (after Finster and Schmidt 1976: 153–57, figs 80–84), but note that the shape and position of the towers is incorrect.

those regions during the Sasanian period: they also offer evidence for a significant investment in irrigation and industrialised agriculture in the former region as well as the exploitation of more marginal lands to the south.[104]

The importance of maritime trade to the Sasanian economy and development of the Persian Gulf has been emphasised in many studies yet its scale and organisation are still unclear. Daryaee and Morony follow Whitehouse and Williamson in arguing that it was highly developed and similar to that known from the Abbasid period,[105] although Priestman is more cautious,[106] and Asadi *et al*. argue that local agricultural production was of greater importance along the northern Persian Gulf.[107] Moreover, on the southern side of the Persian Gulf, a re-assessment of earlier surveys combined with more recent work shows that the extent of permanent settlement in eastern Arabia during this period is considerably less than previously assumed.[108] However, the unexcavated Sasanian ports of Rev Ardashir (modern Rishahr) and Ubulla probably

[104] Hartnell 2014; Asadi *et al*., this volume.

[105] Daryaeee 2003; 2010: 405–406; Morony 2004: 185–88; see Whitehouse and Williamson 1973.

[106] Priestman, this volume.

[107] Asadi *et al*., this volume.

[108] Kennet 2007.

Figure 27. Aerial view of Ruqbat al-Mada'in showing substantial areas of near-surface housing separated by streets with projecting horseshoe-shaped interval towers along the hollow curtain wall and signs of extensive looting (Google Earth, 2018)

served in tandem as gateways to and from Fars and Mesopotamia, thus the forerunners of Bushehr and Basra respectively. They must also have been magnets for investment, and Carter follows Williamson in suggesting that Rishahr and the neighbouring Iranian coastline took over, and benefited from, the bulk of the Persian Gulf pearling industry at this period.[109] The excavation of a port such as this might completely change our understanding of Sasanian maritime trade, just as the recent decades of research in the Red Sea have shown that it was considerably more dynamic in Late Antiquity than previously recognised.[110] Underwater discoveries of torpedo jars and military equipment off the Iranian coast between Gonaveh and Bushehr indicate that ships were sailing the region,[111] and finds of Mesopotamian, south-east Iranian and Indian pottery, imported Sasanian glass and south or south-east Asian glass beads at the site of Kush in present-day Ras al-Khaimah (United Arab Emirates),[112] or Sasanian torpedo jars at the pepper-exporting centre of Pattanam in southern India, illustrate directions and some of the commodities of trade.[113] The construction of a tower at Kush, along with other finds which indicate a militarised presence there in the late Sasanian period, may be interpreted along similar lines. This was the largest settlement in the northern Emirates at this period, situated next to a lagoon and dominating a fertile hinterland where date cultivation played an important economic role, alongside year-round fishing and the herding of sheep and goat.[114]

The intensification of agriculture had several significant effects on the Sasanian economy. It increased the population-carrying capacity of the land, as well as the volume and regularity of product from agro-industries such as textiles and leather-working, ensured greater supplies of fuel for pyro-industries such as metal, glass and pottery, and generated increased revenue through taxation of crop yields. Fertile regions therefore must have been regarded by the state and private individuals alike as highly desirable and very important assets. It is not surprising to see investment being made in these regions, and not simply through water engineering works.

The extent of integrated planning is becoming clearer not only in Mesopotamia, but also both sides of the present Iran/Azerbaijan border,[115] the Gorgan plain of north-east Iran,[116] and the Merv oasis.[117] These are all highly fertile regions. Although the increasing use of mechanisation in the agriculture is rapidly transforming the archaeological landscape into a zone of destruction, it is clear from the number, density and size of mounded sites that the Gorgan plain had a very lengthy and prosperous pattern of settlement beginning in the 6th millennium BC.[118] From the early 19th century onwards, it was also noted that there was a very substantial linear feature running across this region between the Kopet Dagh and the Caspian sea. Its dating attracted many different opinions, some relying on hear-say and others citing evidence of Caspian sea-level changes, pottery and historical sources, to argue for dates ranging between the 5th or 4th century BC (when it was attributed either to the Achaemenids or Alexander the Great respectively) and the 6th century (when it was assigned to one of the Sasanian rulers). The results of the more recent joint Iranian-British project to study this wall using a wide variety of techniques have conclusively shown that it was constructed within a short period of time, probably during the second or third quarter of the 5th century although possibly slightly later, and must reflect an urgent imperial Sasanian response to the very real threat posed by the

[109] Carter 2012: 23–29; see Williamson 1972: 106.
[110] Tomber 2008; Sidebotham 2011.
[111] Tofighian, Nadooshan and Mousavi 2011.
[112] Kennet 2004.
[113] Tomber 2007.
[114] Simpson *et al.* forthcoming *b*.
[115] Alizadeh 2014; Ur and Alizadeh, this volume.
[116] Sauer *et al.* 2013.
[117] Simpson 2014*b*.
[118] Sauer *et al.* 2013: 93.

Hephthalites. A summary of the results is presented below.[119] They necessitate a complete re-assessment of the organisation of the Sasanian army and imply that it must have been a professional body, rather than a feudal levy as often assumed, and suggest a closer relationship between military and non-military planners than previously considered.

Additionally, the implications of the surveys are that the Sasanian state succeeded in transforming large areas of the natural landscape into highly productive sources of food and revenue, and the results of this must have had profound social as well as economic effects. Ensuring this not only meant guaranteeing large and regular supplies of water but also manpower to work the land. As stated at the outset of this section, Classical, Syriac and later Persian authors repeatedly refer to the transplanting of substantial urban populations from Roman Syria into lower Mesopotamia and Iran following campaigns by Shapur I. Although details are vague and partly contradictory, the gist is clear. People were regarded as valuable assets and the movement of populations in this manner was not restricted to Roman deportees as a later source, the *Nihāyatu l'arab*, refers to 12,000 Iranians from Istakhr and 4,000 from Isfahan being sent to Nisibis after its capture by Shapur II in AD 363 (see below). Another late memory of this was captured in the 8th or early 9th century Pahlavi text known as the *Shahrestānīhā-ye Ērānshahr [Provincial Capitals of Iran]*. This lists a large number of cities in what it claims to be the 'land of the Iranians', although the later date of the text means it adds places more familiar to an Abbasid readership and their alleged founders are often mythical or hear-say characters.[120]

The Sasanian use of mass deportation of people from one region to another follows a long history in the Near East, and was recognised for its economic benefits as well as its symbolic value. In his three great Roman campaigns between AD 240 and 260, Shapur I took a large number of captives, and during his second campaign alone he sacked as many as 37 cities, including Antioch and Dura. In about 260 he defeated the emperor Valerian and his own *Res Gestae* states that 'we took him prisoner with our own hands as well as the other commanders of the army, the Praetorian Prefect, senators and officials. All these we took prisoner and deported to Persis'.[121] The inscription continues with a statement that they were not only moved deep into Iran but were distributed across old and new cities in different regions:

> 'We led away into captivity men from the Empire of the Romans, non-Iranians, and settled them into our Empire of Iranians, in Persia, in Parthia, in Susiana and in Assuristan and in every other nation where our own and our father's and our forefather's foundations were'.[122]

These victories were a wake-up call for Rome and drastic measures put in place in order to generate more money to overhaul their eastern frontier. The first step was the confiscation of long-established urban revenues, such as local tolls, taxes and endowment proceeds, followed by debasement of the coinage and price fixing to compensate for the massive inflation resulting, and finally new regular taxes on economic production.[123] Although a military status quo was re-established at first, the successes were relatively short-lived as a more aggressive policy was adopted by Shapur II (AD 309–379) with further campaigns in upper Mesopotamia. According to Ammianus, virtually the entire population of Singara was taken into captivity after a short siege in AD 359/60, 'transported to the remotest parts of Persia', and soon afterwards Shapur crossed the Tigris and sacked the frontier city at Bezabde:[124] the hagiographical source known as the *Testimony of the Captives* refers to the deportation of some 9,000 of its inhabitants to Khuzestan.[125]

These captured cities must have been repopulated with communities brought from elsewhere, and this explains the passage in the *Nihāyatu l'arab* described above.[126] Singara also had a strong Iranian garrison which is said to have returned to Iran at the time of the Arab Conquest.[127] This movement of Iranians into western frontier zones must have been intended to help bolster Iranian identity and allegiance in these newly conquered cities. Moreover, this process was not limited to urban population transfers as Kavad is said to have settled people in villages in different parts of Iraq.[128] Shayegan views the wars as being 'over the control of trade with the East' and less through ideology than 'the necessity to protect the economic interests of the urban clientele'.[129] Classical and Syriac sources imply that the westward population transfers which followed Sasanian victories were intended as acts of revenge and involved great hardship, but the reality seems to be more complex. These populations were valuable human resources who included builders, craftsmen and simple manpower, all taxable and able to contribute to imperial projects. Trade clauses and border infringements may have been *casus belli* but the economic incentives of these operations must have been very tempting for a state which enjoyed

[119] Omrani Rekavandi *et al.*, this volume.
[120] Marquart 1931; Daryaee 2002.
[121] Gk., ll.24–26, p. 313.
[122] Gk., ll.34–35, p. 315.
[123] Heather 2005: 64–65.
[124] Ammianus, *History* 20.6.7.
[125] Lieu 1986: 496.
[126] Browne 1900: 221.
[127] Hill 1971: 86; see Morony 1982: 9.
[128] Morony 1976: 41.
[129] Shayegan 2003: 373.

military supremacy in the field. Moreover, these were not the only sources of labour available. Corvée work by local peasants, cheap immigrants and slaves was also likely. One wonders where the deportees of Sasanian campaigns were placed if these policies were to be maintained: were they moved deeper into Iran, were they dissipated across numerous regions, and how many might have been put to hard work on canal building or mining? Deportees were effectively enslaved, and history tells us that slaves are generally not treated very kindly and are given tasks that no-one else is prepared to do voluntarily.

The westward shift of the Sasanian frontier in the 4th century brought it into deeper contact with eastern Roman culture and thus directly propelled it into the modern debate as to how far the Sasanian empire might be regarded as Late Antique.[130] As Heather has observed, frontiers are zones of contact rather than simply strict lines of demarcation.[131] Alizadeh has argued, on the basis of archaeological work in north-west Iran and neighbouring Azerbaijan, that the borderlands 'were as important as heartlands for the maintenance of internal order',[132] and this statement is supported by archaeological evidence from other frontier regions. Moreover, successful frontiers not only require good soldiers, but also rely on effective logistics ranging from the supply of regular and large quantities of food and fodder to materials, both in raw and finished form. The second and third sections in this volume address the question of what we know about the Sasanian agricultural economy, followed by some of the equivalent evidence for manufacturing crafts and industries.

[130] Morony 2008.
[131] Heather 2009: 73.
[132] Alizadeh 2014: 111.

Parthian and Sasanian Site and Settlement Patterns on the Deh Luran Plain, Khuzistan Province, South-West Iran

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Introduction

The purpose of this paper is threefold: (1) present an interim report on the Partho-Sasanian occupations of the Deh Luran plain, (2) compare the settlement patterns of the Deh Luran plain for the Partho-Sasanian periods with those published for other nearby regions of the Middle East, and (3) discuss the possible role(s) of the Deh Luran plain in relation to the larger economic and socio-political centres in the greater Mesopotamian sphere during these periods.[1]

The settlement pattern data presented in this paper derived from a comprehensive archaeological programme conducted on the Deh Luran plain of south-western Iran, but curtailed since the Iranian Revolution of 1979. Sponsored by Rice University and funded by the National Science Foundation, this programme was under the general direction of Dr Frank Hole. The majority of the data were collected during a 1968/69 reconnaissance of the plain,[2] although some information also comes from the 1963/64 fieldwork.[3]

This paper will relate the results of a second phase of analysis to consider the Partho-Sasanian occupations of the plain in a more detailed exposition. While the basic information and associations may be adjudged accurate, the temporal placement of some of the sites involved is tentative. The trends brought to light in this secondary analysis will most likely stand as presented, but the support of specialists is being sought to assess the results of our analyses of the unglazed pottery. It is possible that changes will have to be made in a few cases of site period assignment, as well as mean site size and population estimates. We are currently working to present a final report on these periods in the near future.[4]

Environmental setting

The environment of the plain has been recognised as playing an important role in the cultural development and settlement distributions through time. The details concerning the environment of the Deh Luran plain have been published in several venues.[5] Only the most salient characteristics of the environment pertaining to the economy and settlement pattern study are reviewed here.

The Deh Luran plain (Figure 1) is located in south-west Iran near the border with Iraq, some 300 km north of the Persian Gulf and 550 km south-west of Tehran. Note that this is about 200 km south-east of the Diyala region of Iraq and 125 km north-west of the Upper Khuzistan (Susiana) plain, areas to be referred to later in the paper in relation to the findings of the intensive archaeological surveys conducted by Adams and Wenke.[6]

The Deh Luran plain lies within the semi-arid steppe of the Zagros foothills biotic province at an elevation of about 150 to 300 m above sea level.[7] The summer months are dry and hot, and high mean temperatures of over 50°C are quite common. Winter temperatures seldom fall below freezing. The annual precipitation of 250 to 350 mm is highly variable and not equally distributed throughout the year. In the winter, when the vast majority of the precipitation occurs, the alluvial plain is transformed in places into meadows of various grasses and wild flowers. The area is not a uniform or homogeneous environmental zone. In consultation with the project's geographers, botanist and zoologist, at least four micro-environmental zones have been

[1] The following individuals have graciously provided their time, labour, and information to the betterment of this study: Elizabeth Carter, John V. Cotter, William E. Doolittle, Lynn Berry Fredlund, McGuire Gibson, John Hansman, David V. Hill, Frank Hole, Vance T. Holliday, Pierre de Miroschedji, St John Simpson, Jason A. Ur, the late Tony J. Wilkinson, and Henry T. Wright. It is with profound gratitude that I acknowledge their contributions.

[2] Neely 1969; 1970; 1974; Neely and Wright 1994; Wright and Neely (eds) 2010.

[3] Hole, Flannery and Neely 1969.

[4] Neely and Wright in preparation; another version of the present paper was published by the author as Neely 2016.

[5] Hole 1987; Hole, Flannery and Neely 1969; Kirkby 1977; Kirkby and Kirkby 1969; Neely 1974; Neely and Wright 1994; Wright and Neely (eds) 2010.

[6] Adams 1962a; 1965; Wenke 1975/76; 1987.

[7] See Hatt's [1959] 'Assyrian Steppe'.

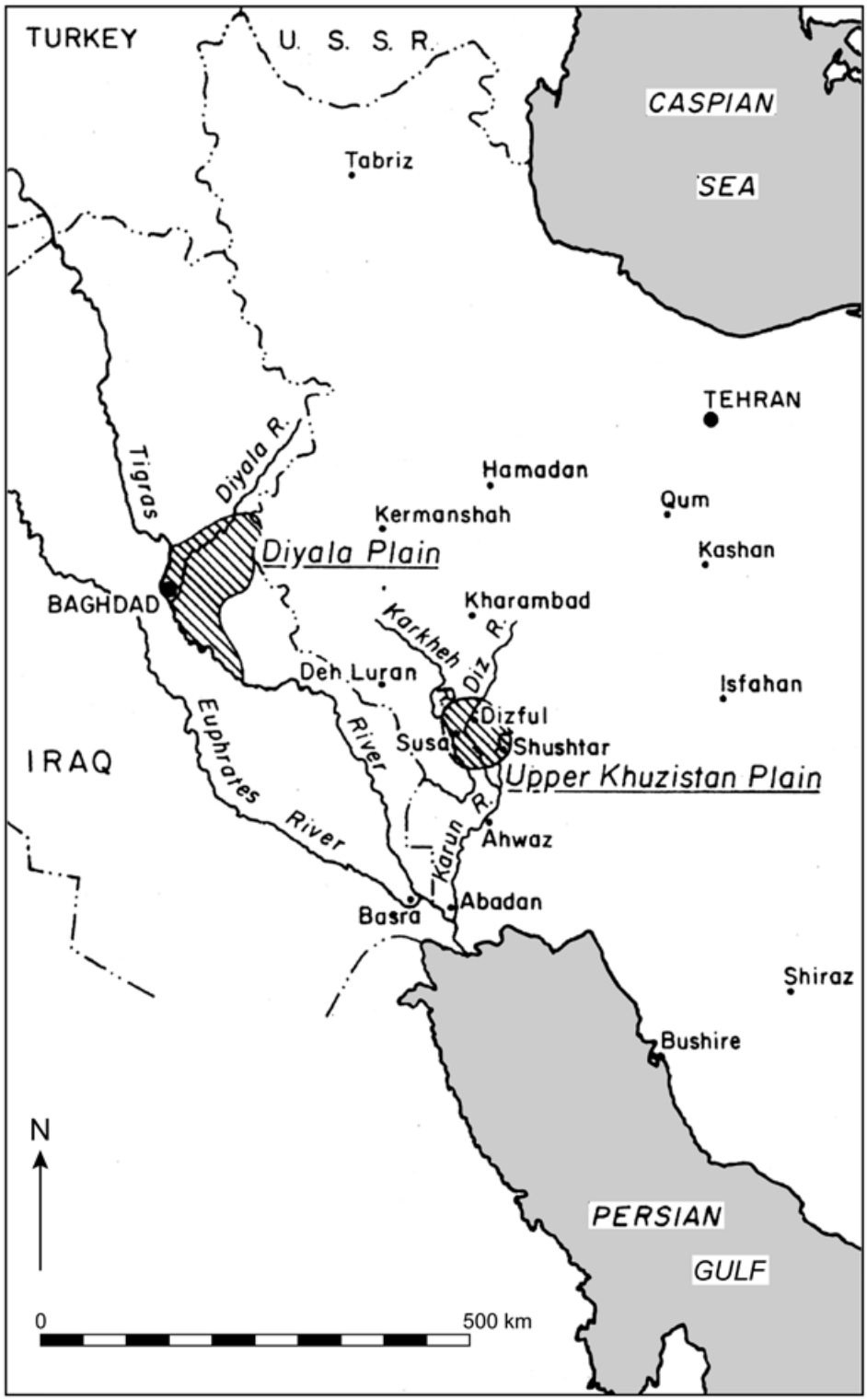

Figure 1. The location of the Deh Luran plain in relation to the Diyala plain and the Upper Khuzistan (Susiana) plain

defined.[8] These are based on the present-day situation,[9] as well as data derived from studies pertaining to the early periods of occupation of the plain (Figure 2).[10] The four zones are:

- rocky piedmont zone
- riverine zone
- alluvial plain zone
- shallow, salty marsh zone

The rocky piedmont (Figure 3) forms the northern portion of the survey area, north of the improved road passing south-east-to-north-west through the Deh Luran plain from the city of Dezful. The piedmont

[8] Coe and Flannery 1964.
[9] Hole, Flannery and Neely 1969; Kirkby 1977; Kirkby and Kirkby 1969.
[10] Hole, Flannery and Neely 1969.