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Short fieldwork report

Human remains from Kafarved-Varzaneh survey, Iran, 2018-2019

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The Zāyandeh-rūd River is the main water artery of the Iranian Central Plateau, enabling human settlement and the development of various cultures in this arid region. Despite a long history of human occupation in the river basin, archaeological investigations have been limited in this region, with a small-scale archaeological excavation at Tappeh Kopande (Saedi-Anaraki 2009), survey in the eastern zone of Zāyandeh-rūd (Salehi Kakhki 2007) and another survey around the so-called "Shahre Saba" near Gāvkhūni wetland (Esmaeil Jelodar 2012).

To fill the gap in knowledge about the prehistory of the Zāyandeh-rūd basin, the Institute of Archaeology at the Art University of Isfahan has set up an archaeological

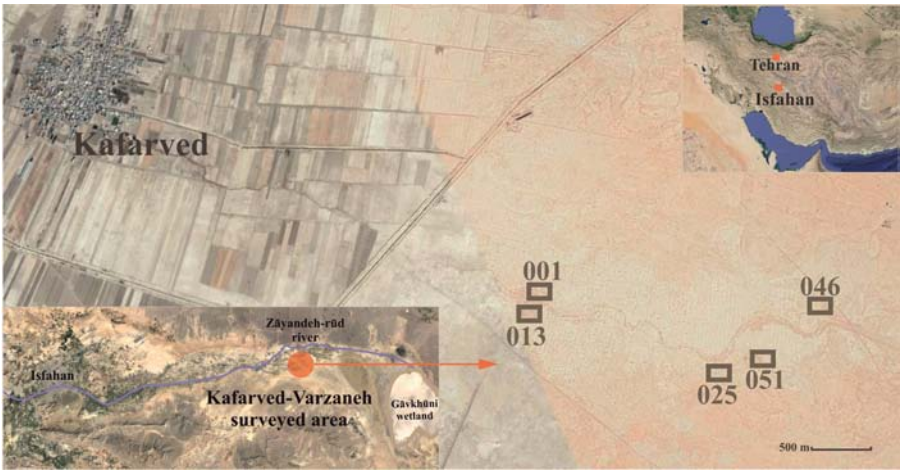

Figure 1. Location of the surveyed area near Kafarved. Drawing by Tabasom Ilkhan.

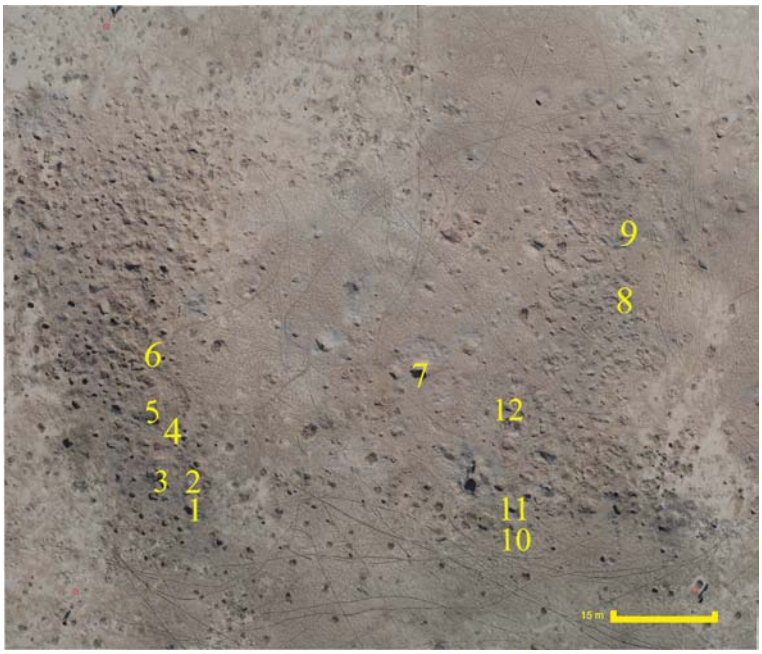

Figure 2. Aerial photograph showing the locations of looting pits in a part of site 051. Photograph by Payam Entekhabi.

project in the eastern zone of the basin, east of Isfahan near Varzaneh (**Figure 1**). The surveyed area is a plain, c. 15×15km, situated at the western fringe of the Central Desert between Varzaneh and Kafarved (Kafrood), c. 5–10km south of the river and c. 30km west of the Gāvkhūni wetland that is the terminal basin of Zayandeh-rud. Although the plain is located among salt desert basins and the annual rainfall is low (less than 100mm), today small-scale irrigation agriculture is possible in this area.

The archaeological survey undertaken by Babak Rafi'i-Alavi and Ali Shojaee-Esfahani in 2018 and 2019 (Rafi'i-Alavi & Shojaee-Esfahani 2020; Shojaee-Esfahani & Rafi'i-Alavi 2020) resulted in the discovery of more than 70 archaeological sites, from which three (006, 013 and 051) have been excavated. This whole area has been heavily looted by treasure-hunters and damaged by bulldozing. Most human remains collected during the survey were found at the surface, in the dumps around recently looted graves. Only two almost complete burials were found at site 051.

The most prominent archaeological site in the surveyed region is Tappeh Gabri (labelled as 013 during the survey, covering c. 4ha), which is located c. 7km south-east of Kafarved and c. 1500m south of the river (32°21′52″N, 52°33′08″E). The site 025 (32°21′24″N, 52°33′45″E) covers c. 5ha, with some parts damaged by bulldozing. Most human remains collected at this site were found in the dumps of

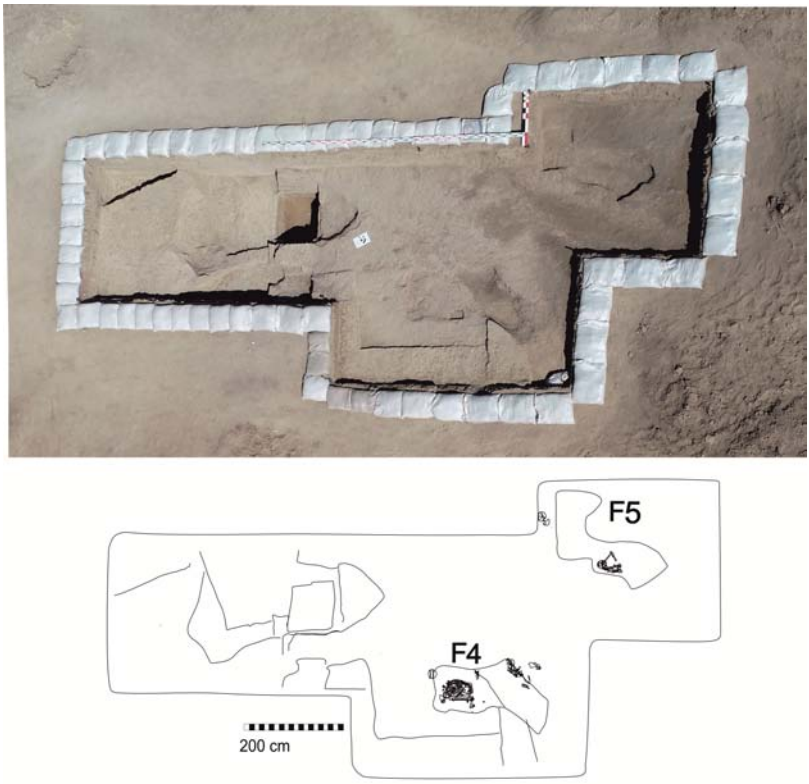

Figure 3. Site 051, trench 2: location of the graves. Photograph by Payam Entekhabi and drawing by Tabasom Ilkhan.

looted pits at the eastern corner, presumably a local cemetery. Other sites are 046 (32°21′31″N, 52°34′04″E) and 051 (32°21′23″N, 52°33′53″E), located south-east to Tappeh Gabri.

After the first season, in the autumn 2018, a second survey was carried out in February 2019 at site 051 in the pits that were dramatically looted, to secure exposed human remains and artefacts. A large number of human and animal bones together with many pieces of pottery, metals and stone tools, dated roughly to the second part of the 3rd millennium BCE, were retrieved from 12 pits at this site (**Figure 2**). Two radiocarbon dates obtained for human bone collagen indicate that at least the cemeteries at the sites 025 and 051 could have been contemporary (Poz-120653, site 025, 2617–2351 cal. BC; Poz-120651, site 051 pit 9, 2567–2306 cal. BC).

During the second season of excavations in August and September 2019, five trenches in different parts of site 051 were opened. In trench 2, two complete graves

Figure 4. Site 051, trench 2, feature 4. Photograph by Tabasom Ilkhan.

were found (**Figure 3**). Parallel to excavation, survey at sites 046 and 064 was carried out, revealing more human bones. In this part of the surveyed area, apart from human remains, many animal bones were also found.

Trench 2, measuring 12×5m, at the south-eastern part of site 051 was opened among the looted pits. Before identifying the first grave (feature 4), a number of fragmented human bones was discovered in the subsurface layer, including occipital bone, metatarsals and tarsals, metacarpals and a phalanx. The grave measured 256×176cm and was situated only 32cm below the soil surface. It contained an articulated adult skeleton placed on its right side in a flexed position, oriented along the E–W axis (**Figure 4**). This burial included various objects: a jar, a marble vessel, a bronze or copper axe and plaque, a stone bead above the skull, a cylindrical carnelian bead with gold bonnet, 13 stone beads, articulated animal skeletons, as well as some small pieces of gold and silver (**Figure 5**). There were also fragmented remains of an infant with cube shaped animal bones located close to the cervical vertebrae of an adult individual.

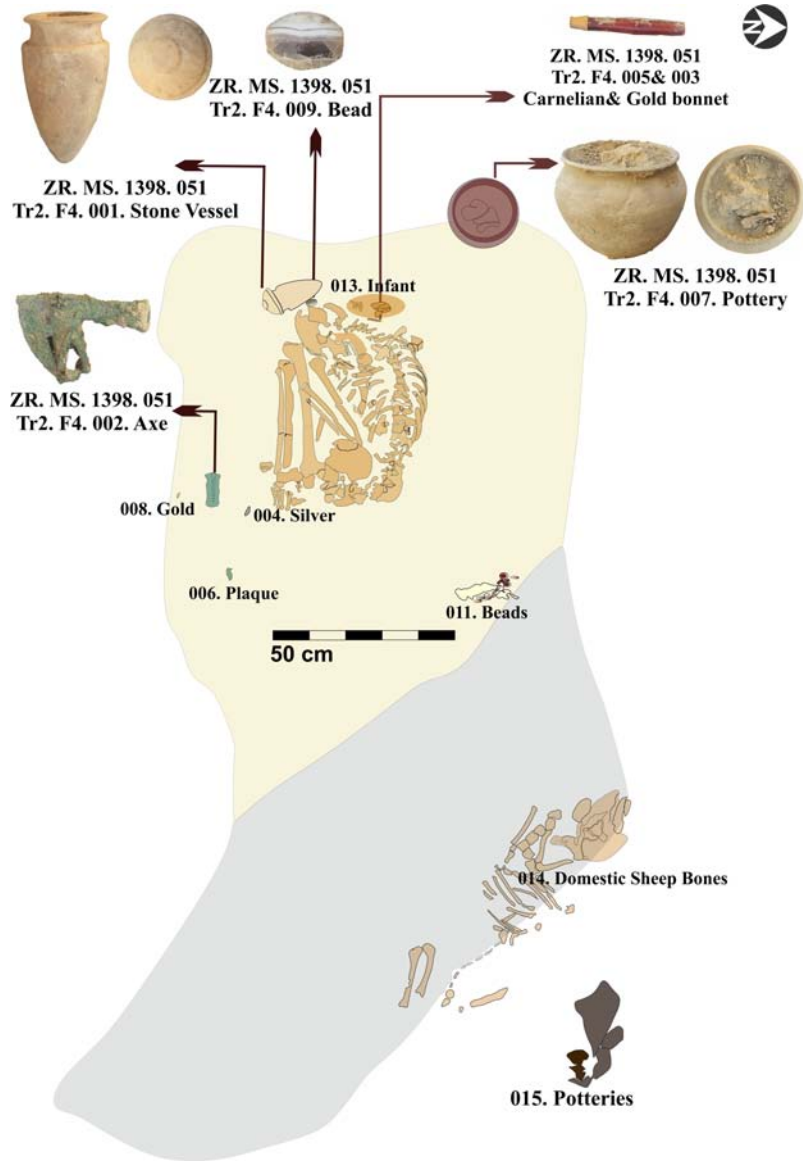

Figure 5. Site 051, trench 2, feature 4: plan of the grave and location of the grave goods. Drawing by Tabasom Ilkhan.

In the eastern part of the trench, the second burial (feature 5, 203×55cm, 44cm below the surface) was discovered with an incomplete skeleton (**Figure 6**); the lower part was missing except one patella. Articulated bovid bones were found on the floor

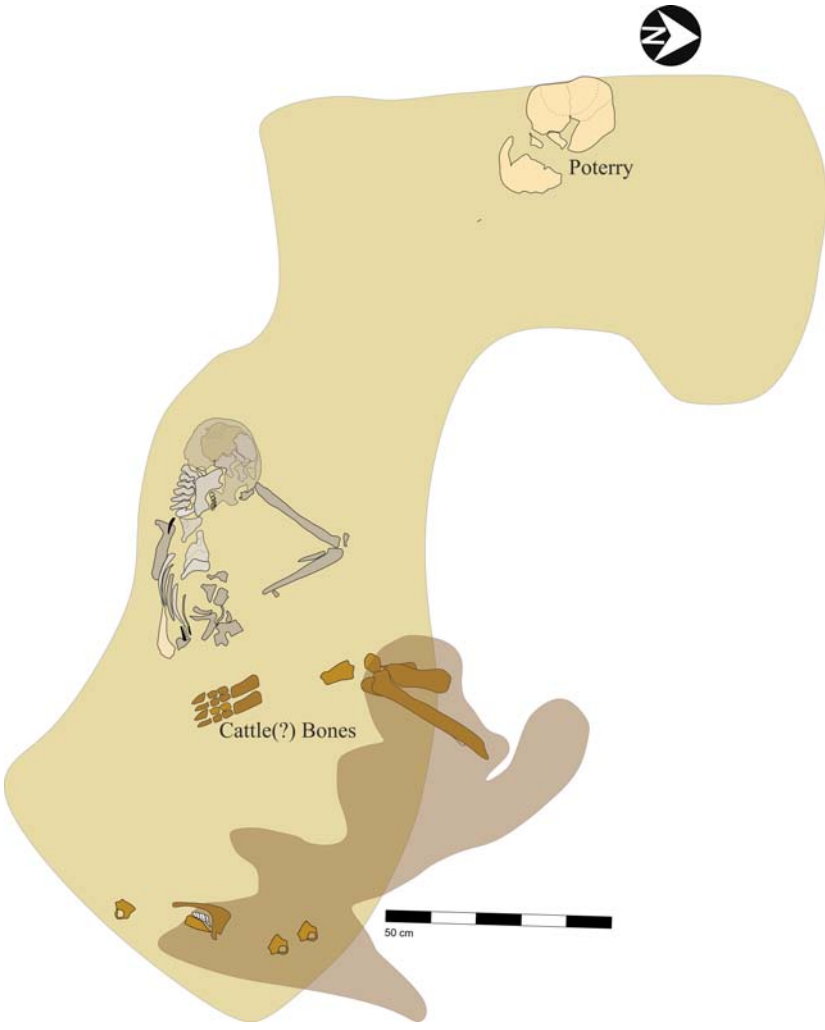

Figure 6. Site 051, trench 2, feature 5. Photograph by Tabasom Ilkhan.

of the grave, although it is possible that it represented a later context that disturbed the original grave. The human skeleton was oriented along the E–W axis and placed on its left side. No grave goods were found and there were only some scattered pottery sherds in the pit fill.

Human remains from the Kafarved-Varzaneh survey are currently stored at the Art University of Isfahan. They were studied in June and September 2019 in the facilities of the Institute of Archaeology, Kashan University and Art University of Isfahan, using the standard protocols presented in Buikstra & Ubelaker (1994) with

some modifications (see Sołtysiak et al. 2019). As most elements were retrieved from the dumps of the pits dug by the looters, the main objective was to estimate the minimum number of individuals (MNI), sex and age-at-death patterns, acknowledging bias due to possible mixing of bones from nearby graves.

Archaeological operations at the sites surveyed and excavated near Kafarved were undertaken in five terms between August 2018 and September 2019, therefore basic data for the human remains retrieved during each term have been presented in separate tables (**Tables 1–5**). The total MNI is 66, but many individuals were represented by a few elements. The assemblage with the highest MNI, and fairly high completeness of the skeletons, was site 051, pit 7. Most Likely Number of Individuals (MLNI) was also calculated using Chapman's formula (see Nikita & Lahr 2011) based on the number of calcanei (5 paired, two right). In this case MLNI equals MNI = 7.

Bones from the Kafarved–Varzaneh area were usually well preserved, occasionally with some taphonomic effects, including brown staining (site 051, pit 7; site 025); sinuous notches on the bone surface, most likely due to insect activity (site 051, pit 12 and pits explored in September 2018; site 013, pit 1; site 025); and crystalline deposits

Table 1. Human remains from Kafarved–Varzaneh I.
Survey and limited excavations (only at site 13) in August–September 2018.

No	Site	Feature	Sex	Age-at-death	Caries	Comments
1	001	surface	?	adult		only one metatarsal
2	013	surface	F*	young adult	2/9	
3	013	surface	–	6–9		
4	025	surface	?	adult	0/3	MNI=2 based on left tibiae
5	025	surface	?	adult		
6	025	surface	–	7–14		
7	046	surface	F*	young adult	0/8	
8	046	surface	F	adult		

Table 2. Human remains from Kafarved–Varzaneh II.
Survey at looted pits of site 051 in September 2018.

No	Site	Feature	Sex	Age-at-death	Comments
9	051	A2	M*	adult	
10	051	A2	?	adult	a few bones
11	051	B2	M**	adult	
12	051	C2	?	adult	
13	051	C2	?	adolescent	
14	051	E	?	adult	
15	051	F	?	adult	
16	051	H	–	7–14	

on bone surfaces (site 051, pit B2). Many elements retrieved from the dumps were broken postmortem, most likely during looting activities.

There is no sex bias in the sample (**Table 6**) and the proportions of age-at-death categories, acknowledging all biases related to the rescue character of the operations,

Table 3. Human remains from Kafarved–Varzaneh III. Survey at looted pits of site 051 in October 2018.

No	Site	Feature	Sex	Age-at-death	Caries	Comments
17	051	pit 2	F	adult	0/6	MNI=4 based on left femora and tibiae
18	051	pit 2	F*	adult	1/8	
19	051	pit 2	M**	35–40	0/6	
20	051	pit 2	?	adult	2/2	
21	051	pit 2	–	7–10		
22	051	pit 2	–	1.5–2		MNI=4 based on teeth
23	051	pit 2	–	3		
24	051	pit 2	–	0.5		
25	051	pit 2	–	5		
26	051	pit 3	F	adult	1/11	MNI=2 based on left humeri
27	051	pit 3	M	35–40		
28	051	pit 3	–	7–14		
29	051	pit 3	–	2–5		
30	051	pit 3	–	0.5–1		
31	051	pit 4	?	adult	2/4	mainly upper part of the body
32	051	pit 4	–	0.5–1.5		
33	051	pit 4	–	10–14		
34	051	pit 5	M	adult		MNI=3 based on femoral morphology
35	051	pit 5	?	adult		
36	051	pit 5	?	adolescent		
37	051	pit 6	?	adult	3/14	a few strongly eroded elements
38	051	pit 6	?	adult		
39	051	pit 7	F	adult	0/11	MNI=7 based on right calcanei
40	051	pit 7	M	35–40		
41	051	pit 7	M	30–35	0/15	
42	051	pit 7	M	35–40	0/12	
43	051	pit 7	F**	adult	0/9	
44	051	pit 7	?	adult		
45	051	pit 7	?	adult	0/32	caries in loose teeth
46	051	pit 9	M	adult	0/8	MNI=3 based on first cervical vertebrae
47	051	pit 9	M	adult	1/11	
48	051	pit 9	F**	adult	0/12	
49	051	pit 9	?	adolescent		
50	051	pit 10	M**	adult	2/2	MNI=2 based on right scapulae
51	051	pit 10	?	adult		
52	051	pit 11	M	35–40		
53	051	pit 11	?	adult		MNI=2 based on right scapulae
54	051	pit 11	–	1.5		
55	051	pit 11	–	1.5		
56	051	pit 11	–	1.75		
57	051	pit 12	–	9	0/10	
58	051	pit 12	–	9–10	0/1	
59	051	pit 12	–	12	0/23	

suggest that the sites investigated represent regular attritional cemeteries (Wood et al. 2002), especially at site 51, which included 83% of all identified individuals. In total, almost 40% of identified individuals were subadults.

Dental caries were relatively common at the Kafarved cemeteries, with 6.8% (19 per 279 teeth) in the whole sample, which is a comparable proportion to agricultural populations of Northern Mesopotamia (Sołtysiak 2014). A higher frequency of dental caries has been observed in females (7.4%, 8 per 108 teeth) than in males (4.1%, 4 per 98 teeth), which could be expected taking into consideration dietary preferences of two sexes, with carbohydrates (including fermentable sugars responsible for development of dental caries) preferred by females over proteins that are preferred by males (Wyant & Meiselman 1984) as well as hormonal differences (Lukacs & Largaespada 2006). However, the difference is not statistically significant due to small sample size.

Table 4. Human remains from Kafarved–Varzaneh IV. Survey at looted pits of site 013 in March 2019.

No	Site	Feature	Sex	Age-at-death	Caries
60	013	pit 1	F	45–50	2/8
61	013	pit 1	–	0.75–1	
62	013	pit 1	–	neonate	

Table 5. Human remains from Kafarved–Varzaneh V. Regular excavations at site 051 in September 2019.

No	Site	Feature	Sex	Age-at-death	Caries	Comments
63	051	T1 F4	–	8–9		only one tooth
64	051	T2 F4	M	25–30	1/29	
65	051	T2 F4	–	neonate		
66	051	T2 F5	F*	adult	2/26	

Table 6. Sex and age-at-death categories at the sites covered by the Kafarved–Varzaneh survey.

Site	Subadults				Adults			Total
	0–2	2.5–7	7.5–14	14.5+	M	?	F	
001						1		1
013	2	1					2	5
025			1			2		3
046							2	2
051	8	3	8	3	13	12	8	55
Total	10	4	9	3	13	15	12	66

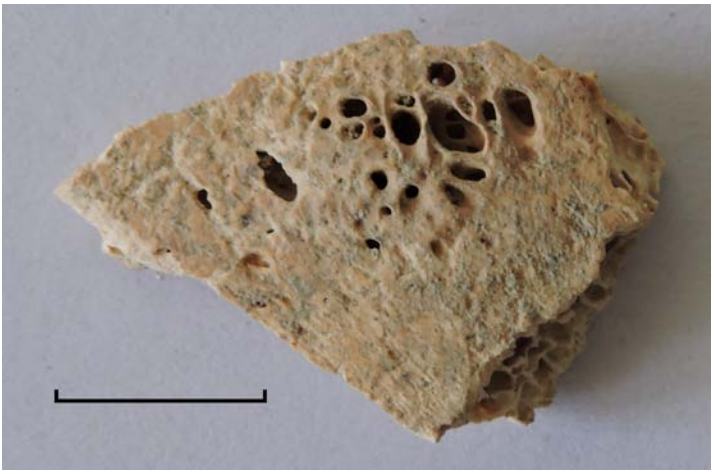

Figure 7. Site 051, pit 4: cranial macroporosity. Scale bar 1cm. Photograph by Arkadiusz Sołtysiak.

Figure 8. Site 051, pit 7: deformation of the proximal end of the left fibula. Scale bar 1cm. Photograph by Arkadiusz Sołtysiak.

The most common pathological condition observed in the assemblage of human remains from the Kafarved–Varzaneh survey was degenerative joint disease, which affected at least two individuals from site 051 pit 7, a single individuals from site 051 pit 2 and pit 3, as well as from trench 2 feature 4. One cranium from site 051 pit 7 exhibited an abscess in the upper left first molar and the other had slight plagiocephaly. Cranial porosities were relatively rare, with one case of bilateral advanced *cribra orbitalia* (site 051 pit 12) and two crania with irregular macroporosity that did not resemble porotic hyperostosis (site 051 pit 4 and 12) (**Figure** 7).

A few cases of trauma have been noted as well. One humerus from site 051 pit 6 was broken at the lateral epicondyle and completely healed with a slight dislocation. In one individual from site 051 pit 7, the left fibula was dislocated in relation to the tibia, with some deformation of the proximal epiphysis and prominent muscular attachments near both ends (**Figure 8**). Perhaps in the same individual, the left ilium was fused with the sacrum. Additional articular surfaces in the retroauricular area

Figure 9. Site 051, pit 7: extension of the auricular surface to the retroauricular area, right ilium. Scale bar 1cm. Photograph by Arkadiusz Sołtysiak.

Figure 10. Site 051, trench 2, feature 4: osteomyelitis in left fibula. Scale bar 1cm. Photograph by Arkadiusz Sołtysiak.

Figure 11. Site 051, trench 2, feature 4: bipartite naviculars. Scale bar 1cm. Photograph by Arkadiusz Sołtysiak.

have been noted on two symmetrical ossa coxae of another individual from the same context (**Figure 9**).

Several pathological conditions were noted in the fairly complete male skeleton from site 051 trench 2 feature 4. There were numerous Schmorl's nodes, especially within the lumbar vertebrae, as well as buttressing of articular surfaces at several cervical vertebrae. In the left fibula, advanced osteomyelitis (cf. Lew & Waldvogel 2004)

was observed (**Figure 10**), with some initial inflammation also visible in the tibia. This individual also had bilateral incidence of bipartite navicular (**Figure 11**), which is an infrequent anatomical variant (Shawdon et al. 1995).

Although only two skeletons from the Kafarved area were retrieved during regular archaeological excavations, the relatively large number of elements recovered at dumps of looted graves enabled some insight into health status and living conditions of a population living in the region. As many cemeteries in Iran have been recently devastated by illegal excavations, the example of the Kafarved–Varzaneh survey shows that rescue operations at already destroyed graves are still worthwhile and can produce meaningful results.

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