Bioarchaeology of the Near East 2:71–77 (2008)

Short Fieldwork Report: Gohar Tepe and Goldar Tepe (Iran), seasons 2006–2007

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(published online on www.anthropology.uw.edu.pl)

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Gohar Tepe and Goldar Tepe (Iran), seasons 2006–2007

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Gohar Tepe is a large archaeological site located in the Mazandaran province, ca. 5 kilometers west of Behshahr (36°40'42"N 53°24'07"E). During the Middle Bronze Age (MBA), the settlement covered more than 10 hectares, but was later abandoned in the Late Bronze Age (LBA) and was used again in the Iron Age 2/3 as a cemetery. There is also another smaller mound some hundred meters west of Gohar Tepe referred to as Goldar Tepe. The whole area is very interesting from an ecological perspective: there is a narrow strip of fertile plain between the Caspian Sea in the north and the foothills of the Elbrus Mountains in the south, widest in the neighbourhood of Sari some 30 kilometers to the west, but only 6–7 kilometers wide close to Gohar Tepe. The seashore can be reached by foot (a one to two-hour walk) and the hills are less than one kilometer from the main site. Because of this, diverse subsistence strategies were always possible in the region, e.g. mountain hunting and seashore fishing, pastoralism in the hills and seashore meadows, and agriculture and horticulture in the plains and in the mountain valleys (cf. Noel 1921). The hills were abundant with timber, wild honey, and good quality flint; there are also many caves, among them the Hotu Cave associa-

ted with the famous remains of a Palaeolithic and Early Neolithic occupation, as well as some human skeletons (Angel 1952; Angel & Coon 1952; Coon 1951, 1957; Coon & Angel 1953). The average annual precipitation in the region is greater than 600 mm, which is more than enough for plant growing. However, one important problem for human populations in this area is the overall lack of fresh water in the plains; there is only one permanent river (Neka) some 10 kilometers to the west of Gohar Tepe and many of the temporary streams that flow down from the mountains disappear during the summer months.

Table 1. General description of the studied skeletons (dental calculus, linear enamel hypoplasia, porotic hyperostosis and cribra orbitalia scored using a 4-point scale: 0 – absent, 1– small, 2 – medium, 3 – high degree; carious lesions were scored as the number of carious lesions per number of preserved teeth). The two skeletons from Goldar Tepe are listed at the end of the table.

Tag	Chronology	Sex	Age	Preservation	Completeness
AH2XXF42	IA 2/3	M	40-50	Good	Fairly complete
AH2XXIF16	IA 2/3	M	40-45	Good	No legs
AH2XXIF20	IA 2/3	–	1.75	Good	Fairly complete
AH2XXIF38	IA 2/3	M	45-50	Good	Average
AH2XXIF58	IA 2/3	M???	35-40?	Average	Average
AH2XXIIB/ok	IA 2/3	–	3	–	Teeth & mandible
AH2XXIIF5	IA 2/3	F?	Adult	Poor	Neurocranium
AH2XXIIF9	IA 2/3	?	Adult	Poor	Skull & teeth
AH2XXIIF10	MBA	M	30–40	Good	Fairly complete
AH2XXIIF56	IA 2/3	–	2	Average	Average
AI2XXL8	–	?	Adult	–	Teeth & cranial fragments
AI2XXFA1	IA 2/3	F	40-50	Very good	Fairly complete
AI2XXFA2	IA 2/3	?	12-15	Average	Average
AI2XXFB1	IA 2/3	–	0	Good	Average
AI2XXF17	IA 2/3	M???	Adult	Very poor	Incomplete
AI2XXF27	IA 2/3	F?	Adult	Average	Average
AI2XXF32	IA 2/3	M	Adult	Average	Average
AI2XXF33	IA 2/3	–	2	Poor	Skull & teeth
AI2XXIF22	IA 2/3	–	3	–	Teeth & cranial fragments
AI2XXIIF6	IA 2/3	M???	Adult	Very poor	Average
AL2XXF11	IA 2/3	?	40-50	–	Teeth & mandible
STS2XVIIF24	IA 2/3	M??	Mature Adult	Poor	Skull & a few other bones
STS2XVIIF27	IA 2/3	M	30-35	Average	Fairly complete
STS2XVIIF28	IA 2/3	F	40-45?	Average	Average
TTMSk1	IA 2/3	M???	Young	Poor	Skull & teeth
TTMSk4	IA 2/3	?	Young	Poor	Skull & teeth
TTMSk5	IA 2/3	–	4+	–	Teeth & cranial fragments
TTMSk9	IA 2/3	M???	40-50	–	Teeth & mandible
TTMSk14	IA 2/3	F???	Adult	–	Teeth & mandible
Goldar Sk3	IA 2	M???	Mature Adult	Poor	Skull & teeth
Goldar Sk4	IA 2	F	Young	Poor	Skull & teeth

Various studies suggest that Caspian Sea levels were variable in the past (Klige & Myagkov 1992; Mamedov 1997; Karpychev 2001). Around the beginning of the Holocene, it was more than 10 meters higher than it is today and most parts of the Mazandaran plains were under water, providing the inhabitants of Hotu Cave and other sites located in the foothills with easy access to marine resources. However, after thousands of years of fluctuations, since ca. 4000 BCE, the sea level reached its present value and in some periods, especially ca. 3000 BCE, was substantially lower, which may have been correlated with the expansion of arable land.

Table 1. Continued. DC – dental caries, DCL – dental calculus, LEH – linear enamel hypoplasia, PH – porotic hyperostosis, CO – cribra orbitalia.

DC	DCL	LEH	PH	CO
0	3	0	0	0
1/32	2	2	0	1
			3	
0	1	1		0
3/17		2	1	
			3	
0	3			0
0	1	2		0
0			0	1
4/28		2		
9/18	1	2		1
0	1	3		1?
			0	1
2/18	2	2	3	0
7/21	2	0	1	
1/9			1	
0				
1/14		2		
0	0	0	0	0
7/25	1	0	1	1
0	2	3	0	
3/31		2		
4/13		2	2	0
0	3	1		
2/2				
9/17		1		0
5/28	2	1	0	0

Gohar Tepe is located near the eastern limit of the Mazandaran plain, close to the lagoon forming south-eastern corner of the Caspian Sea. Such a location must have been very advantageous for local population. Firstly, the area assures easy access to all resources available in the region. The area was rich in resources, the seashore with its marine resources, the fertile agricultural lands in the west, and the mountains in the south with their flint, timber, and other forest resources. Moreover, it is the best location to control traffic from eastern areas of Central Asia to the Armenian Plateau and Transcaucasia in the west. Because of this, there seems to have been great prosperity during the Early and Middle Bronze Age, which is visible in the rich archaeological record for these periods. The abandonment during the LBA may have been related to climatic change, an occurrence which has been suggested by Neumann and Parpola (1987). Perhaps agricultural production declined during this time and the population was forced to move to more stable mountain valleys.

Excavations at Gohar Tepe have been ongoing since 2005 under the direction of Ali Mahfroozi (Iranian Center for Archaeological Research). So far, a large area in the eastern section of the site has been excavated, with about 80 graves dated to the Iron Age as well as some remains of a Middle and Early Bronze Age town found deep in the trenches. In the western area of Gohar Tepe and at Goldar Tepe further west, only a few rescue trenches have been dug; these trenches have also revealed many

Iron Age burials. At Gohar Tepe, the eastern trenches (AH, AI, and AL) are now covered with a roof and are open to the public.

The remains of 29 human skeletons from Gohar Tepe and two from Goldar Tepe were studied in Behshahr in February 2007. The sample consists primarily of complete skeletons from recent excavations in the eastern part of Gohar Tepe (Trenches AH, AI, AL), as well as human teeth and some bones (chiefly skulls) from rescue excavations in the western part of the site and at Goldar Tepe. A general description of all studied skeletons is presented in **Table 1**. The analysis followed protocols described in Buikstra and Ubelaker (1994). There is only one skeleton from the MBA, the remaining individuals came from the Iron Age cemetery. Almost all skeletons were buried with flexed legs, on their sides, sometimes with flat pieces of metal covering their mouths.

The studied sample is not completely random or representative of the ancient population. Firstly, there are more males than females, although this bias may be an artefact of the methods used in sex determination. Many individuals were represented only by teeth and cranial fragments, and in these cases, the methods developed for European and North American populations may not be adequate for individuals from the Near East. Unfortunately, only in less than half of the cases could a sex determination be made using pelvic morphology.

Much more important is the bias in age distribution, with virtually no children in the birth to 2 years age category. In a pre-industrial population, one would expect that up to 30% of skeletons would fall into this age category (cf. Hassan 1981). At Gohar Tepe there were only two infants, in contrast with many middle aged and mature adults of both sexes. It is likely that this bias is a result of excavation policy at the site-museum; jars were left *in situ* and not explored. In the Near East, small infants were often buried in jars. The average age at death appears to be quite high. Of the 14 adults in which at least a rough estimate of age could be made, as many as 8 individuals were over 40 years of age.

Dental caries was very frequent in the studied sample; almost 65% of Iron Age adults with at least one tooth present had a minimum of one carious lesion. Unexpectedly high was the prevalence of carious lesions in the deciduous dentition; among five children between the 2nd and 5th years of life, three individuals had at least one carious lesion. This suggests that the diet of the Iron Age population at Gohar Tepe was abundant in fermentable sugars. As expected in such an early period, oral hygiene was neglected, and in many cases, dental calculus was very pronounced. Also, alveolar resorption due to periodontal disease was widespread. Many teeth had small, sometimes obliterated, non-carious lesions, pointing to a relative abundance of hard particles in the food.

Observed stress markers are ambiguous. Linear enamel hypoplasia was observed frequently, but in most cases the horizontal lines were tiny and sometimes covered completely with dental calculus. Also cribra orbitalia was observed only in the very initial phase or was well healed. However, there were also some very clear and distinct cases of porotic hyperostosis, bone changes which have been linked to conditions such as anemia (e.g., hemolytic and megaloblastic varieties; cf. Walker et al. in press) vitamin deficiency (e.g., rickets, scurvy; cf. Schultz 2001; Ortner et al. 2001), and infection. Therefore, the presence of these conditions suggests that this Iron Age population was subject to a variety of forms of physiological stress (see **Figure 1**). However, it is likely that anemia, vitamin deficiency, and infection were not the sole causes of the stress, and that parasites (i.e., if we take into account that fresh water sources in the area were few and perhaps polluted due to dense settlement), were definitely exacerbating health problems for the inhabitants of the area. No sex differences in the frequency

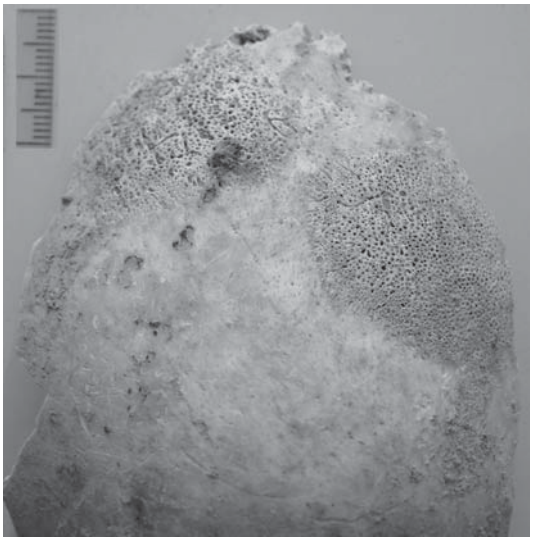

Figure 1. Porotic hyperostosis in AI2XXF27 (adult female [?]).

Figure 2. Healed osteomyelitis in the distal end of the left radius, STS2XVIIF24 (mature male [?]).

of stress markers were observed, although there are some possible differences between the western and eastern parts of the tell. In the west (Goldar Tepe, Areas ST, and TTM), the frequency of porotic hyperostosis seems to be slightly lower and the frequency of dental caries higher compared to the east (Areas AH, AI, and AL). However, such levels of superficial differences may also be observed between Areas AH and AI in the eastern part of the site and it remains impossible to verify them based on such a small sample size.

In many cases, the bones of the studied individuals were quite robust and had very strong muscle attachment sites, especially the popliteal lines of the tibiae, deltoid tuberosities on the humeri, and the ulnar and radial interosseus crests. In many cases asymmetry was observed, especially in the clavicles. All this evidence suggests a high level of physical activity for the Iron Age population. Also, degenerative changes to the joints were widespread, although they seem to be related to an overall greater number of older individuals in the sample. Individual STS2XVIIF24 exhibited very advanced healed osteomyelitis (most likely due to an injury) on the distal end of the left ulna and radius, as well as in the sternal end of left clavicle (**Figure 2**).

In a few cases long bones were preserved well enough at Gohar Tepe to allow for stature estimation. Since there is no estimation formula for Near Eastern populations, formulae for American white males and females were adopted (Trotter & Gleser 1952), although some differences in body proportions must be kept in mind. The average female stature is 157 cm (n=3, SD=2.6) with an average male stature of 170 cm (n=5, SD=7.2). These values are almost identical to the average stature values calculated for populations of the middle Euphrates valley (Tomczyk & Sołtysiak 2007). The Iron Age population from Hasanlu near Lake Rezaiyeh (western Iran) shows somewhat of a lesser degree of sexual dimorphism, with an average estimated stature of males and females of 166.4 cm (n=31, SD=4.2) and 158.1 cm (n=13, SD=3.8) respectively, with the same estimation formula used (Rathbun 1972). However, the Gohar Tepe sample is too small to test the significance of this difference.

In summary, the Iron Age population represented by the cemetery at Gohar Tepe appears to have been very active and relatively healthy, but like every other population, some of its members were subject to physiological stressors in the form of vitamin deficiency, infection and perhaps parasites. Their diet was both abundant in carious-lesion causing sugars but was also very abrasive. More detailed inquiries into differences between Bronze Age and Iron Age populations, as well as living conditions and quality of life during the Iron Age may not be answered at this stage of the research. Following the analysis, the studied skeletons were re-positioned within the site for the open-air exhibition, and some tooth and bone samples were exported to Poland for further biochemical research.

Acknowledgements. I would like to thank Dr. Hassan Fazeli Nashli, the Director of the Iranian Center for Archaeological Research, and Mr. Ali Mahfroozi, the director of the excavations at Gohar Tepe and Goldar Tepe, for their kind invitation to Iran and for their great hospitality during my fieldwork. I am also grateful to Maryam Kolbadinejad and other friends from Mazandaran (Meysam Miri, Serollah Ghasemi, and Esmail Jafarian) with whom I spent an unforgettable time in Behshahr. Many thanks are due to Mindy C. Pitre (University of Alberta, Edmonton, Canada) for reference to recent re-interpretation of porotic hyperostosis and cribra orbitalia.

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Tell Majnuna (Syria), season 2006

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Agricultural production in north-eastern Syria is subject to annual fluctuations due to variable amounts of precipitation during the spring. In 2006, the area received ample precipitation and the crops grew tall. The harvest was so large that the grain storage bins in the village of Tell Brak quickly filled and the bags full of grain had to be heaped in the area of Tell Majnuna, a small tell located some 600 meters north-east to the slopes of Tell Brak (36°40'27"N 41°03'13"E). It was at this location, around Tell Majnuna, that a mechanically-excavated trench was dug by local people who intended to construct a fence protecting this temporary storage place. Also, the south-eastern 1/3 of the tell was completely removed by a bulldozer (see **Figure 1**). Earthworks exposed early Late Chalcolithic 3 strata both in the SW and NE surroundings of the site, and one of these strata appeared to contain many human bones.