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**Research Paper**

# Tappeh Khanileh: New Evidence of Chalcolithic and Iron Age Occupations from Northwest of the Kermanshah Plain, Central Zagros

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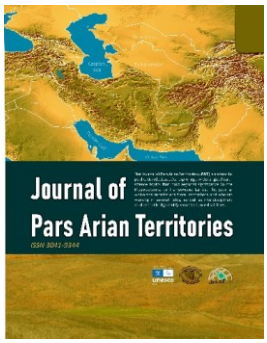


**Abstract**
Tappeh Khanileh is located six kilometers to the southwest of Rawansar and approximately 56 kilometers to the northwest of Kermanshah. The presence of nearby natural springs and its commanding view over the plain attracted people to Khanileh beginning in the Chalcolithic period and through the Bronze, Iron, Historic and Islamic periods. There are two mounds, a possible cemetery, and a destroyed mound surrounding the modern village of Khanileh. Of these, the largest is a mound located west of the village with an archaeological sequence from the Chalcolithic to the Iron Age. The site was located and sampled by F. Biglari in 1984 and later Y. Hassanzadeh in 2004. TL dating of a number of sherds from the 2004 sample has revealed two series of dates: 4th millennium BC and 1st millennium BC. There is also a low mound with a historic occupation south of the village called Tappeh Bawa, which was surveyed but not sampled. Local inhabitants found two glazed short-necked jars of Neo-Assyrian type dating back to around the 7th century BC. The discovery of these glazed jars and some sherds with similar age have indicated the presence of a cemetery or a village during the first half of the 1st millennium BC at Khanileh.

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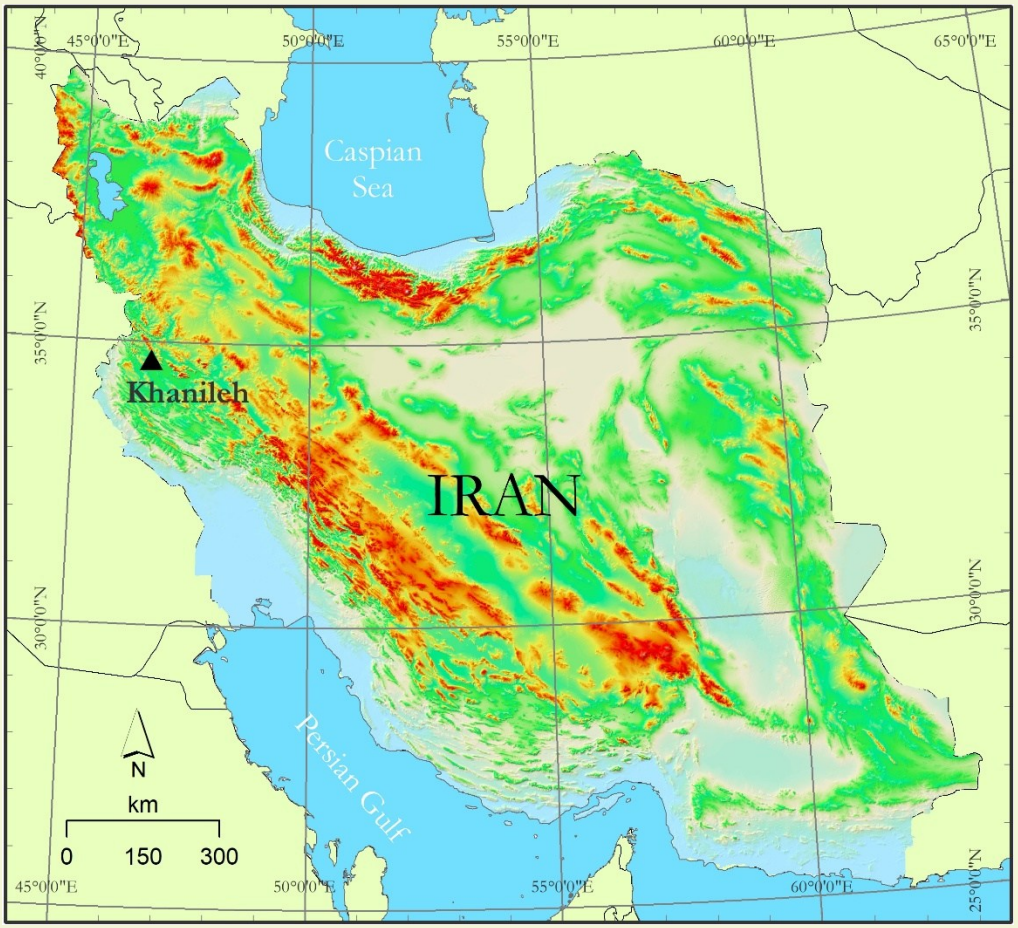
## Geospatial Abstract




Yousef Hassanzadeh

## INTRODUCTION

The Central Zagros region has been witness to multiple archaeological field projects over the course of the last 150 years, and as such, it holds a special place within the field of Iranian Archaeology. In 1959-1960, the Iranian Prehistoric Project under Robert Braidwood (Oriental Institute, University of Chicago) and Ezzatollah Negahban (Tehran University Archaeological Institute) surveyed the region along the Great Khorasan Road in the Central Zagros and excavated at several sites in the Sarpol-Zehab, Islamabad, Mahidasht, and Kermanshah plains (Braidwood et al. 1961). The goal of this project was to elucidate the details of the socio-economic systems during the transition from the Paleolithic to the Neolithic, or from the period of hunting and gathering to the period of settled food production.

The field activities of the Prehistoric Iran Project were followed with surveys and excavations by Iranian, British (Goff 1971), Canadian (Young 1969, Young and Levine 1974) and American (Hole and Flannery 1967) research teams in the 1960s and 1970s (Abdi 1999, Biglari 2001; Biglari and Haydari 2015; Biglari and Shidrang 2019; Shidrang 2006; Abdi 2003). Through these extensive and continuous projects, our knowledge of the Paleolithic, Neolithic, Chalcolithic (Levine and McDonald 1977, Henrickson 1985, Abdi 2003, Renette and Ghasrian 2020), and Bronze Ages (Henrickson 1987), as well as their concomitant processes of political, social, and economic transformation in this region has greatly increased (Hole 1987, Alibaigi and MacGinnis 2022, Alibaigi et al. 2023). Despite the many efforts still ongoing on archaeology, however, many important questions regarding these periods in the Central Zagros remain, including those such as: the nature of the process of development of "J" wares, the distribution of "Dalma" (Henrickson and Vidali 1987) decorated ceramics, the influence of Kura-Araxes ceramics on the region, the use of Urukian stations (Weiss and Young 1975) and the nature and political structures of Godin III (Henrickson 1986) society, all of which require much further research. Accordingly, future surveys in the Central Zagros must retire from the transient and experimental phase and take themselves into the targeted methodical era in order to collect the data necessary to propose theories and answers to the aforementioned questions.

## STUDY AREA

Tappeh Khanileh is located at 46°37'10" East Longitude and 34°40'33" North Latitude, 200 meters west of the village of Khanileh, approximately six kilometers southwest of Rawansar, 56 kilometers northwest of Kermanshah, along the southern flank of the Salakan mountain range in the northwestern margins of the Mahidasht survey area (Figures 2 and 3). The archaeological complex of Khanileh consist of two mounds (Tappeh Khanileh and Tappeh Bawa), one destroyed mound (Tappeh Gella-Jana), and one probable Iron Age graveyard, all of which are located around or in the village of Khanileh (Figure 1). These sites were identified and sampled by Fereidoun Biglari in 1986[1]. The cultural materials gathered during the 1986 survey were re-investigated by Yousef Hassanzadeh during the course of his research on the first millennium occupation of the Rawansar region. The collection's variety and richness convinced him to return to Khanileh during his short surveys of the Rawansar region in May/June 2006[2]. Although the aforementioned survey was initially intended to search for Assyrian encroachments into the region, it was successful in identifying ceramics related to various periods at Tappeh Khanileh, as well as other sites in need of identification and analysis, locales which will be followed up on in this paper. The overall goal here is to introduce and analyze the diagnostic cultural materials produced by the investigation at Tappeh Khanileh and to discuss the other finds connected with the village.

[1] At the recommendation of Shahin Kermanjani at the Organization of Cultural Heritage, Handicrafts, and Tourism of Kermanshah Province, Tappeh Khanileh was listed as #10160 in the National Historic Register on June 23, 2003.

[2] We thank Dr. Marjan Mashkour for identifying several zoological samples. We also greatly thank Dr. Kamyar Abdi for reviewing this text and suggesting revisions. We are also extremely grateful to Mr. Khodadad Yarveisi for donating the two Iron Age glazed ware from Tappeh Khanileh to Iran National Museum collection.


**Figure 1:** General View of Khanileh from the South and the locations under discussion, a) Tappeh Khanileh, Tappeh Bawa, Locus of Glazed Iron Age vessels, destroyed ancient burial ground, b) General view of Tappeh Khanileh and the Village, Illict pits dug mentioned on top of the mound, c) Image of Tappeh Bawa showing the location of the excavated pit, with Tappeh Khanileh visible in the background

## Geographic Setting and Geomorphology of the Region

The Khanileh village fall into what is called the Zagros's Crushed Zone or the High Zagros. The sequence of rocky strata is mostly connected to the Kermanshah Radiolarite Formation and Bisotun formation. The Bisotun Formation, located in the High Zagros zone near Kermanshah in western Iran, represents a significant carbonate succession deposited along the southeastern margin of the Neo-Tethys Ocean during the Late

Triassic to Late Cretaceous. This formation lies adjacent to the Kermanshah Radiolarite Basin and was influenced by the tectonic evolution of the Zagros orogeny, which is part of the broader Alpine-Himalayan belt. The Bisotun limestones were deposited on a homoclinic carbonate ramp, indicating a relatively stable marine platform environment with gradual facies transitions. The depositional setting includes open marine, shoal, lagoon, and tidal flat environments, suggesting a shallow, warm-water carbonate system with limited siliciclastic input (Azimi et al., 2017). Lithologically, the Bisotun Formation is composed predominantly of dark gray, medium- to thick-bedded massive limestones. Petrographic analysis has identified eight carbonate microfacies, including bioclastic wackestones, packstones, and rudist-bearing grainstones. Diagenetic processes such as micritization, dolomitization, silicification, stylolitization, and various forms of cementation have significantly altered the original textures. The presence of dolomite, iron oxides, and bioturbation structures further reflects complex post-depositional histories, making the Bisotun carbonates a valuable archive for reconstructing paleoenvironmental and diagenetic conditions in the Zagros region (Azimi et al., 2017).

The Kermanshah Radiolarite Formation, located in western Iran within the Zagros orogenic belt, represents a significant Mesozoic deep-marine sedimentary sequence deposited along the northern margin of the Neo-Tethys Ocean. This formation is part of a broader tectonic framework shaped by the convergence of the Arabian and Eurasian plates. The radiolarites are associated with the Harsin–Sahneh ophiolitic complex and reflect a geodynamic evolution tied to subduction-related processes and back-arc basin development during the Jurassic period. The region experienced episodes of volcanic activity and internal wave dynamics, which influenced sedimentation patterns and nutrient fluxes, particularly during the Pliensbachian to Aalenian stages (Abdi et al., 2014). Lithologically, the Kermanshah Radiolarite succession comprises a 40-meter-thick sequence of sponge spicule–radiolarian limestones, ribbon cherts, and interbedded pyroclastic deposits. These facies reflect varying environmental conditions: low radiolarian productivity in oxygen-deficient bottom waters during greenhouse phases, and higher productivity linked to volcanic nutrient input and internal wave activity. (Abdi et al., 2016). Radiolarite successions exposed in the outcrops of Khanileh village have served as a valuable source of raw material for the production of stone tools. In contrast, the adjacent limestone sequences have facilitated the formation of small aquifers where they come into contact with the radiolarites, giving rise to several localized springs. Geomorphologically, the radiolarites form a distinct crescent-shaped pattern in the landscape. Due to their higher susceptibility to erosion compared to the more resistant limestones, these units commonly appear as brown-to-purple landforms, creating a striking visual contrast in the terrain.
Based on several different statistical measures, the region's climate is relatively cold and only somewhat wet. Using De Marten's method of the Climatic Dryness Coefficient, the area is dry from May to September, desertic from September to October, somewhat wet during April-May, and very wet during all the other months. In other words, for five months of the year, it is relatively dry, and for seven months of the year, it is wet. Another study using Conrad's Coefficient found that the climate in the region is trending toward becoming wetter. The amount of annual rainfall has now reached almost 600 milliliters. The temperature in summer has been reported to maximize at 45°C and to minimize at -27°C in winter.

## Tappeh Khanileh

Tappeh Khanileh is located approximately 200 meters west of the village of Khanileh, on the eastern side of a seasonal stream and adjacent to the road between Khanileh and Kani-Kaboud (Figures 1b and 1c). This mound, which is located 1405 meters above sea level, covers one hectare and rises five meters above the surrounding ground (Fig. 3). The village graveyard is adjacent to the eastern edge of the mound, and the mound plowed annually across its entire surface, significantly contributing to the erosion of its archaeological deposits. Several hundred meters to the north, there is a permanent spring, whose water is piped into the village of Khanileh. This spring exposes a band of Kermanshah Radiolarite with a large mass of limestone. During the two surveys of 1986 and 2006, seventy pieces of ceramics and forty-one chipped stone artifacts were collected from the surface of the mound, which are now kept at the National Museum of Iran.

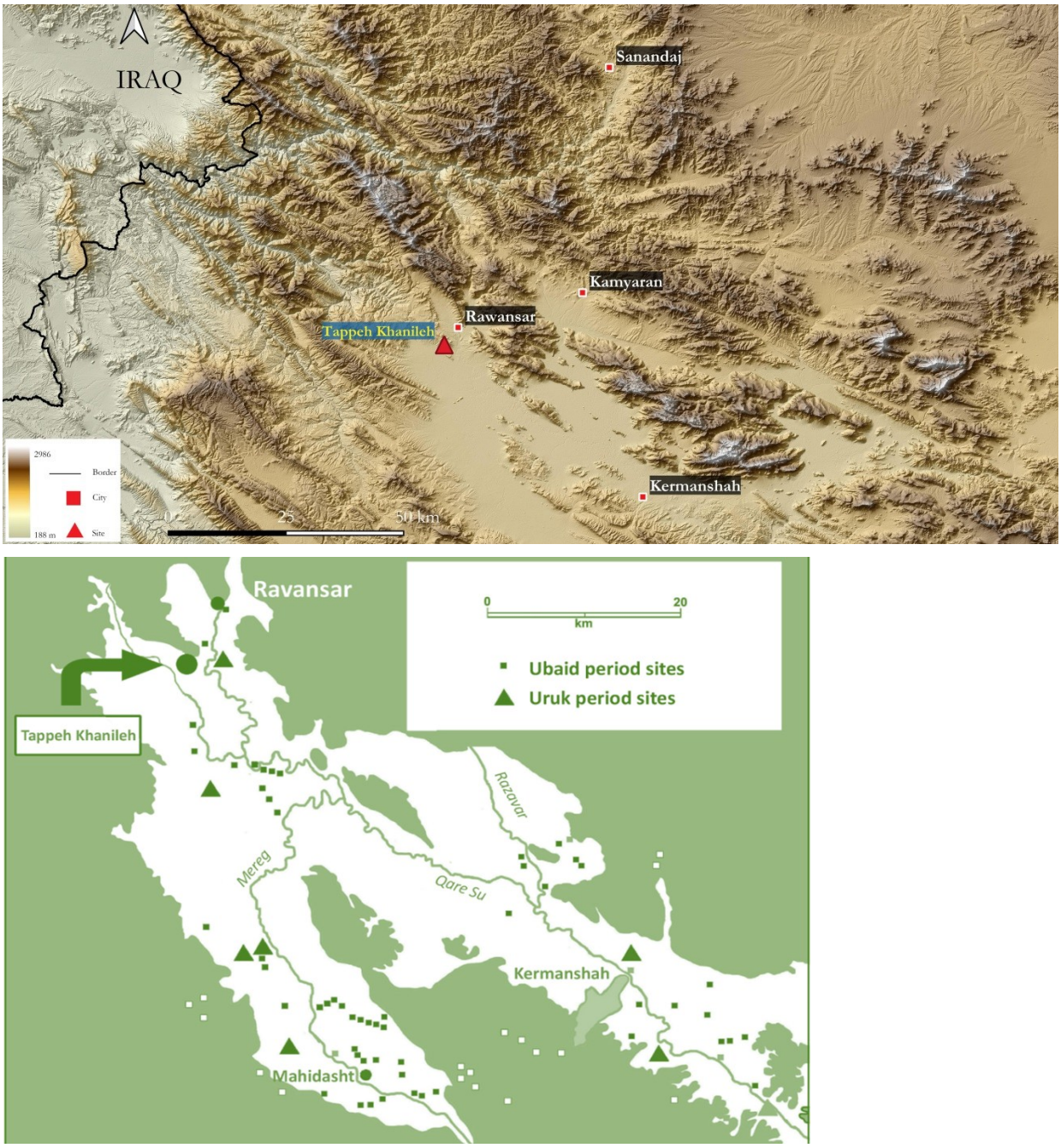



**FIGURE 2.** Up. The Khanileh location, the used base map: COP30; https://opentopography.org/; accessed 2025-02-01, Right. Location of Tappeh Khanileh and identified sites in the Mahidasht; Squares are Ubaid period sites, Triangles are Uruk period sites. Kermanshah lies to the southeast, Rawansar to the north, the big arrow points to Khanileh, and Mahidasht is to the south (Updated based on Levine 1977).


**FIGURE 3. Right.** Plan map of the village (cluster of boxes), mound (grey oval) and graveyard (dotted oval) From left: Tappeh Khanileh, Tappeh Bawa, Locus of Glazed Iron Age vessels, destroyed ancient burial ground **Left top.** Aerial image (Google Earth) of the Rawansar region, highlighting the locations of Khanileh and Tappeh Mousaei, **Left down.** Aerial image (Google Earth) of the Khanileh, indicating the locations of the sites discussed in the paper.

During the 2006 survey two illicit pits dug into the top of the mound were observed (Figs. 1b and 4). The larger trench was located in the northern part of the mound and measured 2×2.5 meters wide and almost three meters deep (Fig. 4). The remains of several stone walls were visible in the section of the trench. A number of ceramic sherds (seemingly Chalcolithic), lithic artifacts, and animal bones were also found in the backdirt adjacent to the pit. In the smaller trench, which was less than one meter wide, the remains of a burial, including the femur, mandible, skull fragments, and phalanges were visible; these remains were likely related to the Islamic period, and this is the probable reason the pit was abandoned. The faunal remains collected during the 2006 survey were identified by Dr. Marjan Mashkour and included a cattle's knuckle (about three years old), and one of a goat as well. A shell of a freshwater bivalve was also found, which likely came from the Qara-Su River 2.5 kilometers to the east or from the Garab stream (Awi-Kher) 2 kilometers to the south. In 2009, illegal excavators opened a deep pit on the mound that was approximately 2×2 meters with a depth of eight meters, and arrived at likely virgin soil at 6 meters below the surface. This trench demonstrated the thickness of deposits at Tappeh Khanileh.

**FIGURE 4.** Illicit excavations on top of Tappeh Khanileh reached virgin soil at a depth of approximately 6 meters. Most of the finds were collected from the backdirt of this deep pit.

### Ceramics

In terms of the chronology of the Central Zagros, the ceramics collected from the surface at Tappeh Khanileh can be divided into four groups, the earliest of which is related to the Chalcolithic, and the most recent of which belongs to the Islamic era (Figure 5 and Table 1).

### Group 1: Middle Chalcolithic

Seven pieces of decorated ceramics were identified as part of this group. The paste of these wares is cream and brick red with a very fine vegetal inclusions. The decorations on the ceramics are all geometric, and include horizontal lines, vertical lines, and cross hatched patterns, executed in either dark brown or black. None of the sherds is decorated on the inner side. This type of pottery is comparable to the monochrome wares of Dalma and Godin VIII and IX (Mortensen 1976: 55, Levine and Young 1986: 21), (Figure 5: 2, Table 1, Figures 4 and 7).

### Group 2: Late Chalcolithic

The largest percentage of ceramics (39% or 23 sherds) belongs to the group of Late Chalcolithic wares. The ware color varies from dark cream, brick red to light brown, and the temper is either straw or fine sand. Most of the potteries of group 2 seem to be wheel made. Vegetal inclusions sometimes create spongy surface on the sherds. Often the outer surface of the potteries had thin slip or wash. Only two cases of thick red slip are observed (Figure 5: 1 and 18). One example, of which there is doubt in its Late Chalcolithic attribution, is a decorated ware with a thick red slip with a musk-colored band on the lip and neck of the vessel (Figure 5: 1). There was also a specimen with a short spout, the surface of which was slipped as well (Figure 5: 12). Based of the rim shapes, both open and closed pottery forms occur in the collections, from which the second type tends to be the more common. Most of the rims tend to be everting. In some of the cases the rim may evert quite sharply, whereas in others it is more gradual. In this collection, two samples with different tempering agents were observed (for instance, fine sand with white grains), the outer surface of one of which had been burnished. The matrix of these ceramics is more of a light grey.[3] However, except for the short spouts and some special rim forms the potteries of the group can not be easily attributed to this period, due to the fact that these forms again appear in later periods.

### Group 3: Middle Elamite Period and the 1st Millennium BCE

Before dealing with the possible Middle Elamite period potteries, it is necessary to first briefly discuss a piece of the Bronze Age pottery. This sherd is part of a rim of an open-mouthed vessel with a light brown matrix, whose paste was tempered with sand and fine straw. The firing of the piece is complete and it seems to have been wheel-thrown. This piece is therefore attributed to the third millennium and is in many ways very similar to the ceramics of the Late Chalcolithic period. On the other hand, however, the matrix and the tempering materials, as well as the type of slip on the piece are not comparable to the aforementioned Chalcolithic wares (Figure 5: 12).

After the Late Chalcolithic wares, ceramics considered to belong to the Middle Elamite period compose the largest percentage of the sample (20 pieces), however, unfortunately most of these pieces are body sherds of vessels and mostly non-diagnostic. The matrix of this group of wares ranges in color from bricky red to creamy light brown. Some of the diagnostic features of this group include relatively round and everting rims with striking linear decorations, with both blocky and cord-like shapes (Figure 5: 3 and 14). The imprints of

[3] The term "incompletely fired" is used in archaeological texts, and is also known as a "mis-firing". This is important to note, because the degree of firing is meaningful for consideration of the ceramics. The existence of a black or grey matrix in the ceramics is caused by a rapid temperature increase and a lack of ability for gasses to escape completely during the glassification process. Based on this, our suggestion is mention the color of matrix in the ceramics instead of use the term "incompletely fired" (F. Bahrol'oloomi).

coarse plant material are visible on the surfaces of some of these ceramics and their insides are mostly light or dark grey. All of them seem to be wheel-thrown and slipped with a brick red or sometimes thick cream color. One of the diagnostic samples of this collection, which is connected to the Middle Elamite Period, has a bottom button resultant from the process of its cutting (String-cut base), a technique often seen to be used with wheel-thrown ceramics (Figure 5: 17).

**Table 1:** Description of the Ceramic finds from Figure 8. Numbered from top to bottom, left to right on Figure 8.

| # | Relative Chron | Description | Absolute Chron | Comparanda |
|---|---|---|---|---|
| 1 | Late Chalcolithic | Light Brown Matrix, Fine sand temper, light cream slip on inner surface, red-brown slip on outer surface, black painted decorations, possibly wheel thrown | | Levine & Young 1986: Fig 31. #3 |
| 2 | Middle Chalcolithic | Light Brown Matrix, Coarse and Fine straw temper, Light cream slip on both surfaces, black painted decorations | | Levine &Young 1986: P. 4 Fig 7<br>Levine & McDonald 1977: 1, Ia |
| 3 | Middle Elamite | Light Brown Matrix, Coarse straw temper, White inclusions, Grey pith, Wheel fired, wet slipped exterior | | Similar to: Carter 1978: Fig 47, #9 |
| 4 | Middle Chalcolithic | Light Cream matrix, Coarse straw temper, hand thrown, straw marks on inner and outer surfaces, dark brown painted decorations | | Levine & Young 1986: Fig. 9, #35.2 |
| 5 | Late Chalcolithic | Light Brown matrix, fine straw temper, Grey Pith, thin brick-red slip on inner surface | | Wright et al. 1975, Fig. 7: F |
| 6 | Late Chalcolithic? | Brown matrix, fine straw temper, slip on outer surface, burnished inner surface, possibly wheel thrown | | -- |
| 7 | Middle Chalcolithic | Brick red matrix, Coarse sand temper, fine white inclusions in matrix, dark cream slip on inner surface, handmade, dark brown painted decorations | | Levine & Young 1986, Fig 8: b |
| 8 | Late Chalcolithic | Brown Matrix, Coarse sand temper, Grey pith, white inclusions in matrix, wheel thrown, hand applied slip on inner and outer surfaces | | Similar to: Zagarell 1975, Fig 3: 4 |
| 9 | Islamic | Grey Matrix, Fine sand temper, fine white inclusions in matrix, wheel thrown | | -- |
| 10 | 1st mill. BCE | Light Brown Matrix, coarse sand temper, white nodules in matrix, both surfaces grey with burnishing, wheel thrown | | |
| 11 | Parthian | Grey Matrix, Unidentifiable temper, Brick red slip on inner surface, wheel thrown | | -- |
| 12 | Middle Chalcolithic | Dark Cream matrix, Coarse sand temper, Light cream slip | 3600 ± 165 BCE | -- |
| 13 | 1st Mill. BCE | Light Brown Matrix, Coarse sand temper, wheel thrown, black blots on outer surface, black pith | | -- |
| 14 | Middle Elamite | Brown Matrix, Coarse Straw temper, incompletely fired, wheel thrown, cream slip on both surfaces, straw impressions visible on both surfaces | | -- |
| 15 | Late Chalcolithic | Light brown matrix, Fine straw temper, white inclusions, light grey pith, slip on outer surface, wheel thrown | 3520 ± 290 BCE | Zagarell 1975, Fig. 3: 2 |
| 16 | Late Chalcolithic | Dark cream matrix, coarse sand temper, white inclusions, slipped on both surfaces | | Zagarell P. 15b, Fig 3: 4 |
| 17 | Middle Elamite | Brick red matrix, fine straw temper, wheel thrown, slip on outer surface | | Similar to: Miroschedji 1978, Fig 50: b |
| 18 | Late Chalcolithic | Dark Cream matrix, Fine Sand temper, Brick Red slip on inner surface, wheel thrown | | Wright et al. 1975, Fig. 7: F |
| 19 | 1st Mill. BCE | Light Brown matrix, fine sand temper, wheel thrown, white inclusions, completely fired, fine straw impressions visible on both surfaces, both surfaces seem to be burnished | | -- |
| 20 | 1st Mill. BCE | Light brown matrix, fine sand temper, white inclusions, completely fired, outer surface burnished | | -- |
| 21 | Mid-Late 1st mill BCE | Light grey matrix, fine sand temper, wheel thrown, completely fired, outer surface burnished, white inclusions in matrix | 450 ± 180 BCE | |
| 22 | Possible Early 3rd Mill BCE | Light Brown matrix, Fine sand and straw temper, wheel thrown, completely fired, outer surface slipped with thick brownish red, outer surface burnished over the paint | | -- |
| 23 | Iron III (8th – 7th Century BCE). | Diameter of mouth 4.9, Height 9.8, body diameter 7.7 cm; glazed small pitcher, decorated, completely figred, wheel thrown, matrix light cream | | |
| 24 | Iron III (8th – 7th Century BCE). | Diameter of mouth 4.6, Height 10.5, body diameter 7.6 cm; glazed small pitcher, decorated, completely figred, wheel thrown, matrix light cream | | |

This type of pottery is comparable to different types of button-base wares from other sites in southwestern Iran (Carter 1978: Figure 9, #47). Among the other diagnostic ceramics that herald the arrival of the Middle Elamite phase that were found at Tappeh Khanileh include ceramics with applique bands across the body of the vessel into which fingers were pressed. This type of pottery mostly has a brown matrix with a temper of coarse straw. Most of these wares are dark grey on the inside, and some are covered in a thick cream slip on their outer surfaces (Figure 5: 3 and 14). Other diagnostic features include the imprints left by coarse straw on both the outer and inner surfaces of the wares. Also a number of vessel rims are observed in this collection, which with attention to their form and matrix may be considered to belong to the 1st millennium BCE. The matrix of these wares is either grey or light brown and has a temper of fine sand. The outer surface of these wares is always burnished and in some cases seems to have white sand trapped inside the matrix (Figure 5: 13, 19 to 24). In a small number of cases, the inner surfaces of these wares have also been decorated with burnished designs (Figure 5: 10). Most of these vessels have wide mouths and include cup-shaped and trough-shaped vessels. Some of the types of these cup-shaped vessels are also very commonly observed during historical periods. Comparative thermoluminescence dating will help confirm the age of these samples (Figure 5: 21).

### Group 4: Ceramics of the Historic and Islamic Eras

The number of ceramics relating to the Historical and Islamic Eras at Tappeh Khanileh is very small, and diagnostic pieces are rarely observed. As a result, the two periods have been lumped together into one group containing 10 samples. The samples likely related to the Historical period are mostly either light grey or terracotta colored with a temper of coarse sand. These vessels typically lack necks, but rather have a straight rim. The presence of black blotches and traces of burning suggest these wares were used as cooking vessels. Three samples which are possibly of the Clinky (Jalingi) type, and therefore related to the Parthian period, are wheel thrown and have a reddish brown appearance with an unidentifiable temper and a light grey matrix. The firing technique used has made these wares very strong and durable (Figure 5: 11). There is only one sample of a Grey Ware with a fine white sand temper, the outer surface of which is decorated with diagonal incised decorations in points and parallel lines, which could possibly be related to the Islamic period (Figure 5: 9).

## Chipped stone artifacts

A small collection of 42 lithic artifacts were collected from the surface at Tappeh Khanileh (Figure 6 and 7). This collection includes cores (5 pieces), core fragments (2 pieces), simple flakes (12 pieces), broken flake (6 pieces), flake fragments (5 pieces), debitage (3 pieces) and retouched tools (10 pieces). Other than the several pieces of quartz, this collection is composed entirely of chert. The large majority of the chert is brown in color, though there is also radiolaritic green of the Kermanshah type, a vein of which lies exposed near the site. The location of the site along the northern slope of Salakan provided an easy access to lithic raw materials sources for the inhabitants of the site. The raw material is found as tabular pieces and chunks on the slopes, consisting of coarse to medium-grained, opaque cherts, as well as fine grained cherts with glossy surfaces. However, some of the cherts are not suitable for knapping as they have many veins and seams of other minerals running through them (Figure 8). The high quality reddish brown chert forms approximately 39% of the collection. Other types of chert are observed in the collection, such as matte grey chert and whitish-grey chert, as well as high quality grey translucent chert. The second type of rock present in the collection, though less abundant, is milky quartz with red veins. This material is well-suited for producing flake tools and is found in limited quantities scattered across the site. The primary source of this quartz is local, as it is readily available in the foothills surrounding the area. Approximately 22% of the artifacts collected from the site's surface exhibit cortex. The relatively low proportion of cortical pieces can be attributed to the structural properties of the chert veins in the region, which are distributed across the slopes and lack weathered cortex due to their geological characteristics.

All the cores found were of the flake core type, specifically multidirectional irregular flake cores (Figure 7: 5). Only one core exhibited flakes detached in a parallel pattern along the length of one side. Flakes made up a significant portion of the collection (approximately 75%), with 29% showing retouch. The retouched flakes, in order of frequency, include denticulated flakes (4), truncated flakes (2), partially retouched flakes (2), and

one awl/borer (Figure 7: 2-4). Additionally, a small broken bladelet with inverse retouch along a lateral edge was identified (Figure 7: 1).
The lithic assemblage primarily consists of locally available raw materials, which required minimal time and effort to procure. Although the collection is small, its techno-typological characteristics suggest that toolmakers at Khanileh may never have developed advanced craftsmanship in lithic tool production. Instead, they likely produced simple, ad hoc tools as needed, relying on readily accessible materials. Given that the collection originates from a surface context and is likely multi-period, this pattern appears to have persisted across different periods. It is probable that tool production was carried out at the household level on a daily basis, with minimal time investment.
In sum, assuming this observation is unbiased, lithic tool production at Khanileh was likely predominantly flake-based. The only artifact suggesting specialized production is a small broken bladelet with inverse retouch, which was detached from a prismatic bladelet core (Figure 7: 1). It is possible that this isolated specimen was produced at another settlement site in the area, such as Tappeh Mousaei[4], and transported to Khanileh.

## Chronology of Khanileh

### Thermoluminescence Dating

Ten potsherds were selected from a group of ceramic fragments collected from the backdirt of illicit excavations on top of Tappeh Khanileh for dating using the thermoluminescence technique. In choosing these samples, the authors aimed to select body sherds thicker than two centimeters, allowing for the removal of the surface layer to date the inner matrix of the ceramics.
After having their surfaces shaved off, these ceramics were ground to a power and treated with 5% Acetic Acid. From each sample, at least forty pellets were prepared for testing. The luminosity diagram of 15 samples was measured after they were placed in the oven on a Nickel-Chromium sheet in a pure nitrogenous environment. In the subsequent phase, different numbers of the pellets are exposed to beta streams of Strontium$^{90}$ isotopes at different doses. Half of the samples are measured two days after the exposure, and half of the samples are measured at one month after the exposure in order to account for the loss in perceptibility of the samples. Then, 15 of the pellets are exposed to Americium$^{241}$ in different dosages. With the use of these measurements, the amount of effective energy of the alpha radiation and sensitivity relative to the alpha radiation can be measured. In comparison to the first luminosity diagram (the thermoluminescence of the natural samples) and the luminescence of the samples exposed to beta radiation, the amount of stored energy in the samples can be calculated. The density of the trace elements Potassium, Uranium, Thorium and the lack of the gas Radon were also investigated in these samples using Photometry (Bahrol'oloomi 1999).
Given that the samples used for dating were remnants left behind by illicit smugglers, there is a possibility that the dosimeter's origin could be from the site itself. Based on this, for environmental data collection, such as annual rainfall, the Climate Research Center, located 6 km north of Khanileh in Rawansar, should be consulted. Of the 10 ceramic samples selected, only three were successfully dated. The analysis of the remaining samples was hindered by various issues, including the effects of heat and light over time on the surface of the mound. The resulting chronology of the finds can be divided into two groups: one corresponding to the mid-4$^{th}$ millennium BCE, and the other to the mid-first millennium BCE (Table 1).

### Relative Dating (Typology)

Between the second half of the 7$^{th}$ millennium BCE and the beginning of the 6$^{th}$ millennium, a new style of decorated pottery appeared in the Central Zagros region, replacing the preceding simple undecorated style (Mortenson 1964: 33; Levine and McDonald 1977:40). Examples of this style can be found at Tappeh Gouran, Tappeh Sarab, and a number of other sites on the Holailan, Harsin, and Mahidasht (Kermanshah) plains. Following this further, during the Chalcolithic period, which encompasses 2 millennia between approximately 5500 and 3000 BCE, both fine and coarse ceramics were produced at their locus of

[4] Tappeh Mousaei is contemporaneous with Khanileh and lies 6 km distant in the middle of the city of Rawansar (Garavand et al. 2013).

consumption. These types of wares have been identified at a number of sites in the intermontane valleys of the Zagros. The coarse wares range in color from cream to yellow or red to pink and have coarse straw tempers.

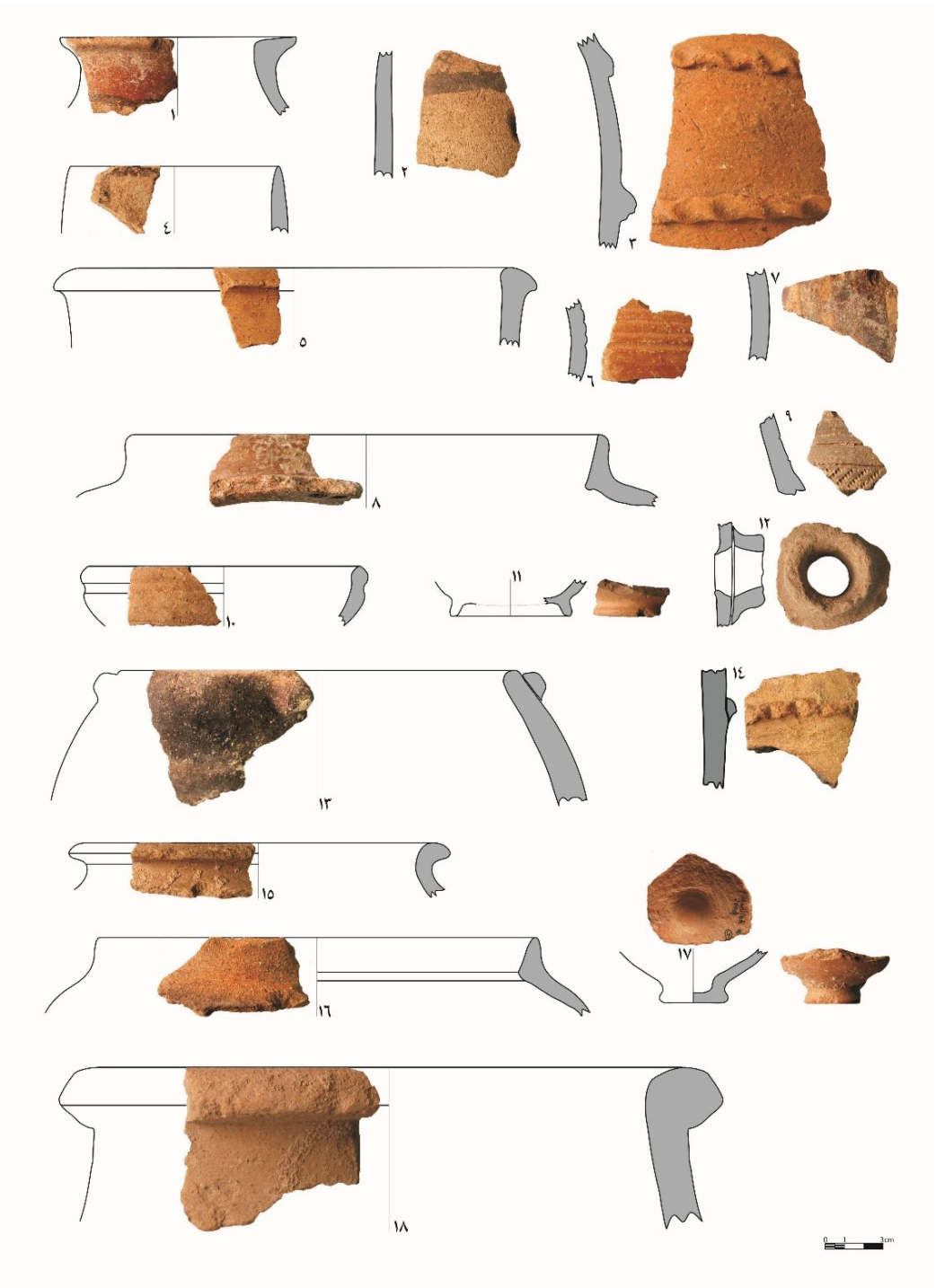


**FIGURE 5a.** Diagnostic Samples of Ceramics from Surface Survey at Khanileh

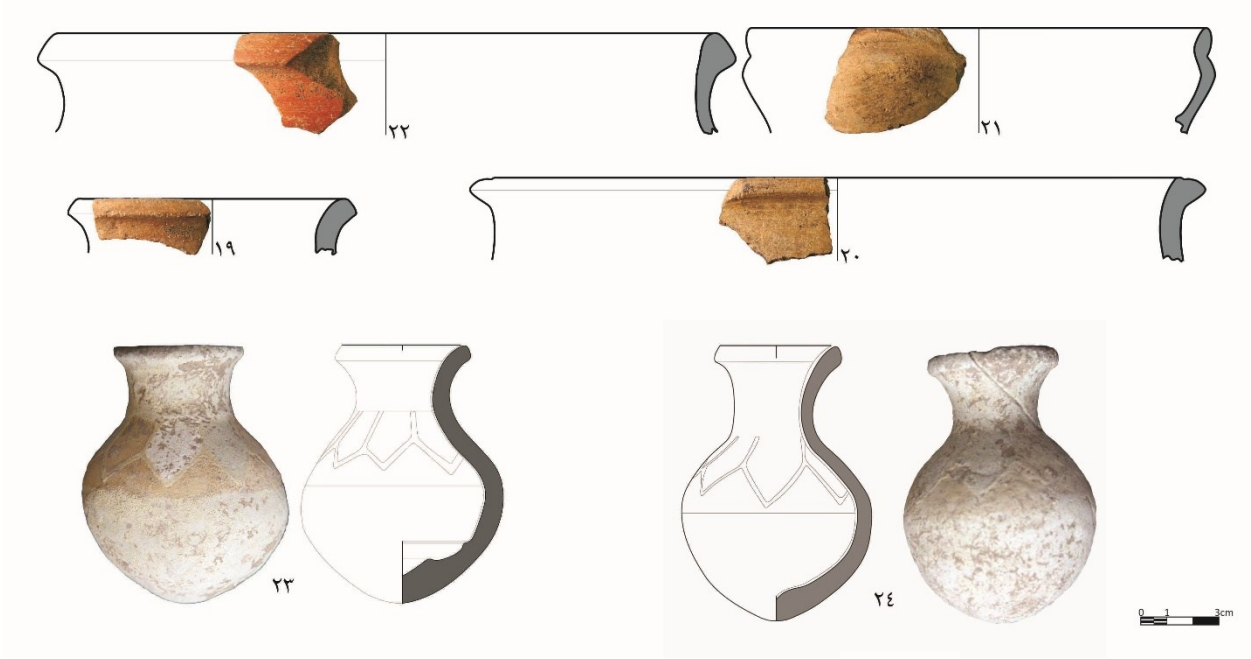



**FIGURE 5b.** Diagnostic Samples of Ceramics from Surface Survey at Khanileh


**FIGURE 6.** lithic artifacts were collected from the surface at Tappeh Khanileh

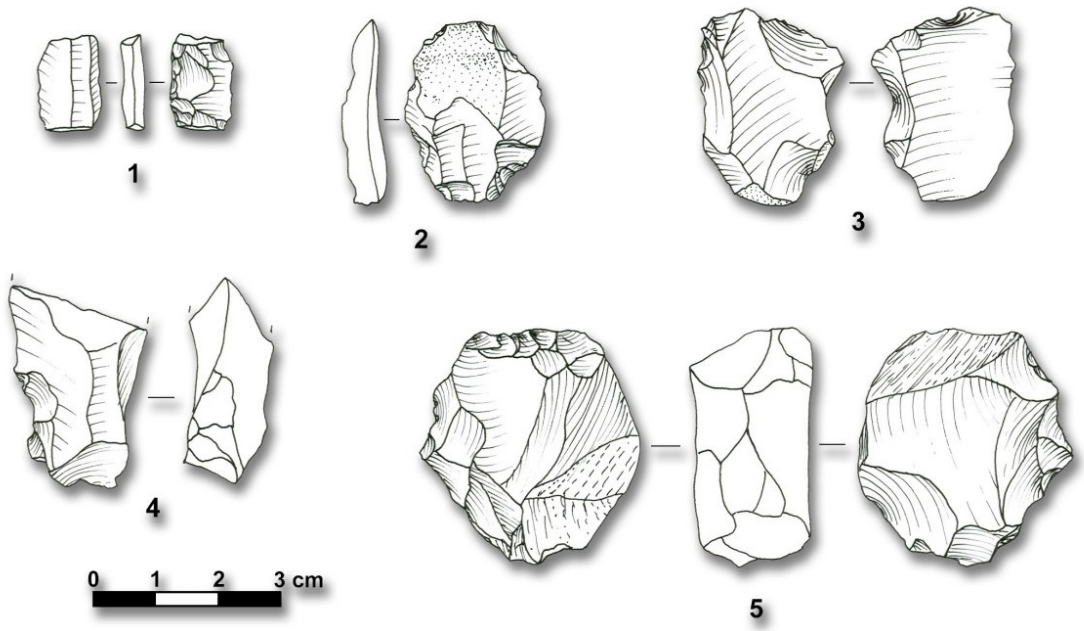



**FIGURE 7.** Lithic artifacts drawing from Tappeh Khanileh


**FIGURE 8.** Exposed Radiolarite near Tappeh Khanileh

The fine wares are mostly cream/buff colored with black painted decorations (Henrickson 1993: 278). Unfortunately it is exceedingly difficult to use these wares in a comparative framework for typological and chronological studies due to a lack of analytical results, unsystematic surveys and the small number of published excavations (Mortenson 1976).

That in mind, the similarities and differences in the production of cultural materials can be taken as differences in regional ceramic-making traditions in the intermontane Zagros valleys. However, major differences in production styles of cultural materials, especially in pottery, can be clearly exhibited even among contemporaneous sites of the same region. For example, comparison of two contemporaneous sites shows that at Tappeh Kazabad[5] B during the Late Chalcolithic ceramics with red slip and coarse sand/grit temper were produced, but at the same time at the site of Kahreh,[6] fine cream wares comparable to types similar to the lands immediately south of the site were being produced. It is worth mentioning that some scholars have argued that these fine wares at this site are related to the Early Chalcolithic period (Mortenson 1974: 37). The presence of the same kind of fine cream/buff wares with black painted decorations has caused archaeologists to draw parallels between these cultural materials in their regional, but also macro-regional context within the Zagros (Mortenson 1974, Levine 1974, Zagarell 1975).

Instead of intensive regional surveys of the intermontane valleys of the Zagros that are used to identify the various cultural periods and then excavate their layers, these surveys can be used as a key to intraregional chronological comparison. Likewise, when looking at a broader perspective, sites whose stratigraphy and chronology (both relative and absolute) have been analyzed separately can be used as comparative samples to other regions in the Zagros. Based on this, it should be possible to conceive of a relatively coordinated chronological sequence in the Central Zagros region. Now, with regards to the aforementioned materials from the site of Khanileh in the Rawansar plain, and with attention to its multi-period sequence, and not forgetting its highly favorable location in an area that a crossroads for a much larger region, Khanileh serves as a relatively suitable chronological and cultural index in the region from the Late Neolithic to the Iron Age.[7]

## Other sites and unique finds

### Geleh-Jana

This site, of which little remains, lies east of the village near the country road. According to locals, between the 1940s and early 1960s, soil from the mound was used for plastering house walls. It is said that each year, during this process of sediment removal, metal and ceramic would surface. A 1964 map of the area depicts the mound as significantly higher than the surrounding springs (Figure 3). In the late 1980s, parts of the mound were partially destroyed and leveled during the construction of the country road, though cultural deposits may still remain beneath roadbed.

### Tappeh Bawa

This mound is located approximately 20 meters south of the village and has a height of less than one meter. It covers an area of about one hectare, and its surface is plowed annually. Numerous small ceramic fragments and broken bones, both burned and calcified, are visible on the surface. Based on the shape of the rims of several potsherds, it is possible that this settlement dated to the Historic periods, especially the Parthian period. However, the presence of straw-tempered and handmade pottery suggests the possibility of older settlements at the site, potentially from the Chalcolithic period. A pit is situated in the northern half of the site, though no pottery was found in the pit's walls.

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[5] Tappeh Kazabad is a site related to the Chalcolithic that was identified by Aurel Stein in 1936 in the Holailan region during his surveys of Central Zagros in Western Iran. The site of Kazabad is divided into Mound A and Mound B. The oldest ceramics on the surface of KazabadA are comparable with Hajji-Firuz Tappeh in Western Azerbaijan and the oldest ceramics from the surface at Kazabad B are comparable with Susa B and C.

[6] Tappeh Kahreh is located approximately 6 kilometers south-southwest of Tappeh Gouran in Kermanshah Province. This site was surveyed for the first time by C. Goff (Goff 1971: Figure 2). The surface ceramics from Kahreh have many similarities with contemporaneous sites on the Susiana Plain (Late Susa period or Susa A).

[7] There is the possibility of ceramics of the Middle Elamite period at the site – which if confirmed would demonstrate the influence of the Elamites on the north central part of the Zagros.

**FIGURE 9.** Different views of the Glazed Iron Age vessel.

## Possible Iron Age Graveyard

Among the other finds from Khanileh were two glazed vessels discovered by a villager during the clearing of abandoned ruins in the village in 1998 (Figure 11). These two glazed ceramic vessels belong to the 'Eggshell' ware type dating to Iron III (Hassanzadeh 2016). Similar examples are commonly found at sites in northwestern Iran (Hassanzadeh 2016), including Ziwiye (Mo'tamadi 1997), Changbar Cemetery, and Kultarikeh (Rezvani and Roustaei 2007) in Kurdistan, as well as at the Qelaichi in Bukan (Kargar 2004) and the Varkabud cemetery (Haerinck and Overlaet 2004: 31, Figure 9) in Lorestan.

These finds consist of small glazed cups with an average height of 9-10 cm and rim with a diameter of 4 cm, decorated with vegetal motifs on the body that resemble a layer of glass[8] (Figure 5: 23 and 24).

A broken animal figurine was found near the findspot of the two glazed vessels. It consists only of the front portion, including the head, neck, two forelegs, and the front half of the torso (Fig. 10). The animal's eyes and nostrils are formed by simple, shallow indentations, while its snout was shaped by finger pressure from both sides. The maker's fingerprints are visible on parts of the surface. The broken sections are light cream in color, while the surface ranges from dark gray to black. The figurine measures 58 millimeters in height. Based on the shape of the forward-facing ears and snout, it appears to represent a dog, though it could also represent another animal species.

The production of such animal figurines was widespread in the Zagros region during the Neolithic and Chalcolithic periods, and they remained relatively common in the later Bronze and Iron Ages.

[8] During a recent visit to the site, it was noted that a large portion had been damaged during the digging of an agricultural pit. Similar glazed wares were observed in the eastern wall of the pit.


**FIGURE 10.** A broken animal figurine from the possible Iron Age Graveyard, Khanileh

## Special find

One of the other finds recovered from the agricultural lands about 700 meters south of the village in 1986 was a bronze socketed trilobite ('three – bladed') arrowhead, 3 cm in length (Figure 11).

Its blades form a rhomboid shape. Trilobate arrowheads were once thought to be associated with the Scythians and Cimmerians, but they were also a common type during the Achaemenid period, where they became a standard form of (Moshtaq 2006: 308, 744). Similar arrowheads are reported from Pasargadae (Stronach 1978: 218–219, pl. 165: a,b)

**FIGURE 11.** Different views of the Trilobate arrowhead from the south of Khanileh

## Concluding Remarks

The discovery of two glazed vessels at Khanileh is significant, as it suggests the presence of a site associated with the Iron III historical period.

This period witnessed many socio-political transformations in the region, characterized by the appearance of the Medes, the encroachment of the Assyrians and finally the Achaemenid occupation. Although the main goal of Louis Levine during the Mahidasht Project was to elucidate some of the uncertainties regarding the historical geography of Assyrian military campaigns, until now, this issue has not been intensively investigated. It should be noted that the original aim of surveying the Rawansar region was to assess Simu

Parpola's (Parpola 2001: Map 11) theory regarding the location of the Assyrian state of Nikkur. However, since little relevant archaeological evidence was found during this initial survey, the results were ultimately disappointing. Nevertheless, given the existing evidence from the first millennium BCE in the region (Figure 5: 23 and 24), there is hope that a more focused survey or excavation could provide clearer insights into this period and location.

Targeted excavations along with the application of new analytical techniques, could help address additional questions about the technological aspects of cultural material production, subsistence strategies, and the socio-political positioning of Khanileh relative to similar cultures to the south and southeast. Based on the cultural materials discovered so far, it can be hypothesized that Khanileh played a significant role in regional networks for the production of ceramics. The presence of a permanent spring, access to fertile plains with productive pastures, and proximity to the highlands provided an ideal environment for settlement, starting as early as the Middle Chalcolithic and continuing through to the historical periods. By the first millennium BCE, the settlement at Khanileh appears to have shifted eastward to the site of the present-day village, where it remained occupied into the historic period.

Khanileh has yielded evidence that can help supplement and refine the chronology of the intermontane regions of the Central Zagros, particularly for the Chalcolithic period.

With regard to the richness of the remaining materials at Khanileh and the risk of destruction of these sites, the first steps have been taken to confirm its structural integrity and to enter it on the National Historical Register. Because of the construction of livestock and poultry pens, as well as due to agricultural activities on the surface of the mound, and the mound's use as a graveyard for the nearby village, a great deal of the surface and subsurface deposits have already been disturbed. It is imperative to generate a detailed plan for future excavations of the Iron Age Graveyard in the village and at Tappeh Khanileh itself.

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