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BİLDİRİLER/PROCEEDINGS



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CONICAL DOMED ROUND STRUCTURES OF THE DELİ HALİL SETTLEMENT IN CILICIA

Füsun TÜLEK[1]

Round structures frequent an ancient settlement situated on south slope of a volcano, the Deli Halil, in East Plain Cilicia. The ancient settlement, named after the volcano, has round structures both built-in and on ground on circular plans. Built-in structures are walled with basalt stones and have tops flat or conical in shape and have openings rectangular or circular in shape; some do have terracotta pipes for either to collect surface water and or to fill olive oil or grain in. Built-on structures rise above ground in cylindrical shape with walls corbelling to form a conical dome.

Numerous archaeological sites in Anatolia dating from Neolithic Period to Roman times yield structures built in ground functioned as depots regardless circular or rectangular in plan. However, a round structure circular in plan, built to rise over ground in cylindrical shape with an entrance and a conical dome similar to those of the ancient settlement of Deli Halil is quite unusual and scarcely found in ancient sites of Anatolia. 'Beehive houses' as built-on examples of vernacular architecture in Southeast Anatolia and North Syria differs with their rectangular plan and modular design. Vineyards of Midyat, in Turkey contain structures, named *kokel* or *kımzah,* built-on ground in circular plan with tapering cylindrical shape but with a truncated top.

The Deli Halil is an ancient settlement in Toprakkale town of the Osmaniye Province (Figure 1). The volcano is part of a tectonic formation comprised of a number of smaller volcanoes named by geologists as the Deli Halil Basalts (Doyuran 1982, 152). The Deli Halil Basalts stretch from northeast tip of the Issikos Gulf to east to the Amanus Mountain range separating Issos Plain from the East Plain Cilicia; however a narrow pass, namely the Kısık Pass, between the Basalts and skirts of the Amanus Mountains runs in north- south direction connecting the two plains.

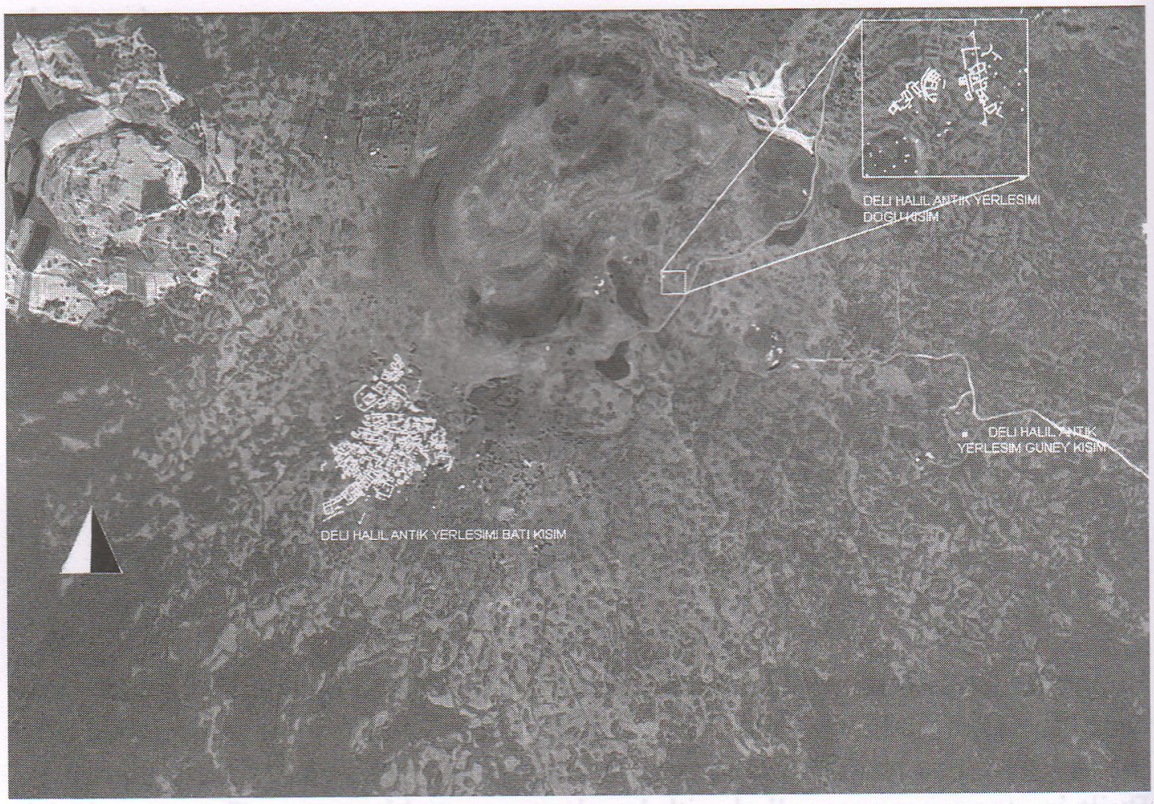


Figure 1. The Deli Halil Volcano and sections of the ancient settlement (Füsun Tülek, C. Sudaş).

The Issos Plain has a long stretch of the Mediterranean Sea and is a coastal plain squeezed between the mountains and the sea. There is a narrow pass, namely the Kısık Pass, at the northeast of the Issos Plain between the Deli Halil Basalts and the first heights of the Amanus mountains in south-north direction connecting the Plain to north, to the east of the Plain Cilicia. The Deli Halil ancient settlement strategically encroaching on south slope of the volcano, which is on west side of the Kısık Pass, has a clear view of the Gulf and the Plain, as well as, the ancient settlements on plain and along the coast. The panoramic view of the settlement spans from east to west including Amanus Mountains, Kısık Pass, ancient city of Issos, Kinet, Kara and Müttalip mounds, ancient port of Burnaz, as well as the Misis Mountain range.

Ruins of a couple of cisterns (!) have been first noticed at the site in year 2000 and registered as National Cultural Heritage when the southeast skirts of the volcano have been chosen as a development and an industrial zone of the Osmaniye Province. In 2008, Osmaniye Archaeological Survey identified the ruins as an ancient settlement for the first time (Tülek, 2009), and examined it until 2012.[2]

The site has never been marked as archaeological ruins on present day official maps. It has never been mentioned in Late Antique and Medieval sources. It has not been mentioned by the prominent 6th century historian, Prokopios in his highly

esteemed account of building activities of the emperor Justinianus, De Aedifici (Whitby, 1986). At the time of the Arab rule the area was part of al-Thughur of the Arab Armies, and the Arab writers have not mentioned it either. Medieval sources, as well as the 19th century accounts of the travelers did not list it together with the sites along the coast and in the Plain of Issos.

The 19th century traveler Ainsworth who explored the foothills of the Amanus range did not notice the ruins (Ainsworth, 1838) neither did Ritter who only described a narrow pass – the Kısık Pass- through which runs the land route leading from Erzin to inland to Çukurova plain (Ritter, 1859). Heberdey and Wilhelm in 1892 (1896, 23), Janke in 1904 (1904, 15-16), and Bell in 1905 (1906, 4-5) passed through the Kısık Pass; and none of these travelers noticed existence of ruins of a settlement on the volcano. In 1935, Honigmann mentioned al-Kussuk Boğaz as a pass leading to Çukurova plain; he also did not notice ruins of an ancient settlement. In 1990s Bilkent University conducted an Archaeological Survey encompassing Yumurtalık, the coast strip from Ceyhan to Issos, and the Iskenderun plain until the skirts of the Amanus range (Özgen and Gates, 1993). Examination of the Bilkent Survey omitted the area around Kısık Pass; thus the Deli Halil settlement has once more gone unnoticed. Geological researchers who examined the volcano proper have not noticed ancient masonry on basalt bedrock to identify the ruins as an archaeological site, either.

Ruins of the ancient settlement are scattered in three clusters, at present stretching from West to East of the South side of the volcano. The three clusters of ruins are identified by the Osmaniye Archaeological Survey as West, North, and South Sections of the settlement (Figure 1). An aerial photograph demonstrated that widespread remains of the settlement were once connected to each other in a single settlement, and that in present day sections lost connections. The Archaeological Survey team documented unspoiled sections of the ancient settlement, which has retained archaeological context. A number of huge hollowed areas at the lower skirts of the volcano are due to harshly exploitation of the volcanic land as a basalt quarry for a long time. Present day, a mine company is still exhausting the volcano digging out pumice for road construction. Thus, in course of time, several roads were opened for heavily loaded big trucks to run through destroying the ancient ruins. Remaining part of the ruins at the North section today are *ca.* 300 m distant to the remains at the East section, whereas the distance between North and West sections are *ca.* 1000 meters. East section of the settlement yet remains to be fully documented.[3]

Ruins at the West section remain in a better state; it structures could have been documented and identified to an extent so that a comprehensible settlement lay out could have been drawn, which contains a temple erected on a higher terrace and a necropolis at its fringes (Figure 2). The West section of the ancient settlement is the largest and the most extensively spread of all the three sections. However,



Figure 2. The layout of the West section of the Deli Halil ancient settlement (Füsun Tülek, C. Sudaş).

the West section has also been plundered by looters, as well as by locals residents as a stone quarry for present day constructions. Potsherds collected in both sides are mostly of terra sigillata import tableware of the Phocaea productions dated

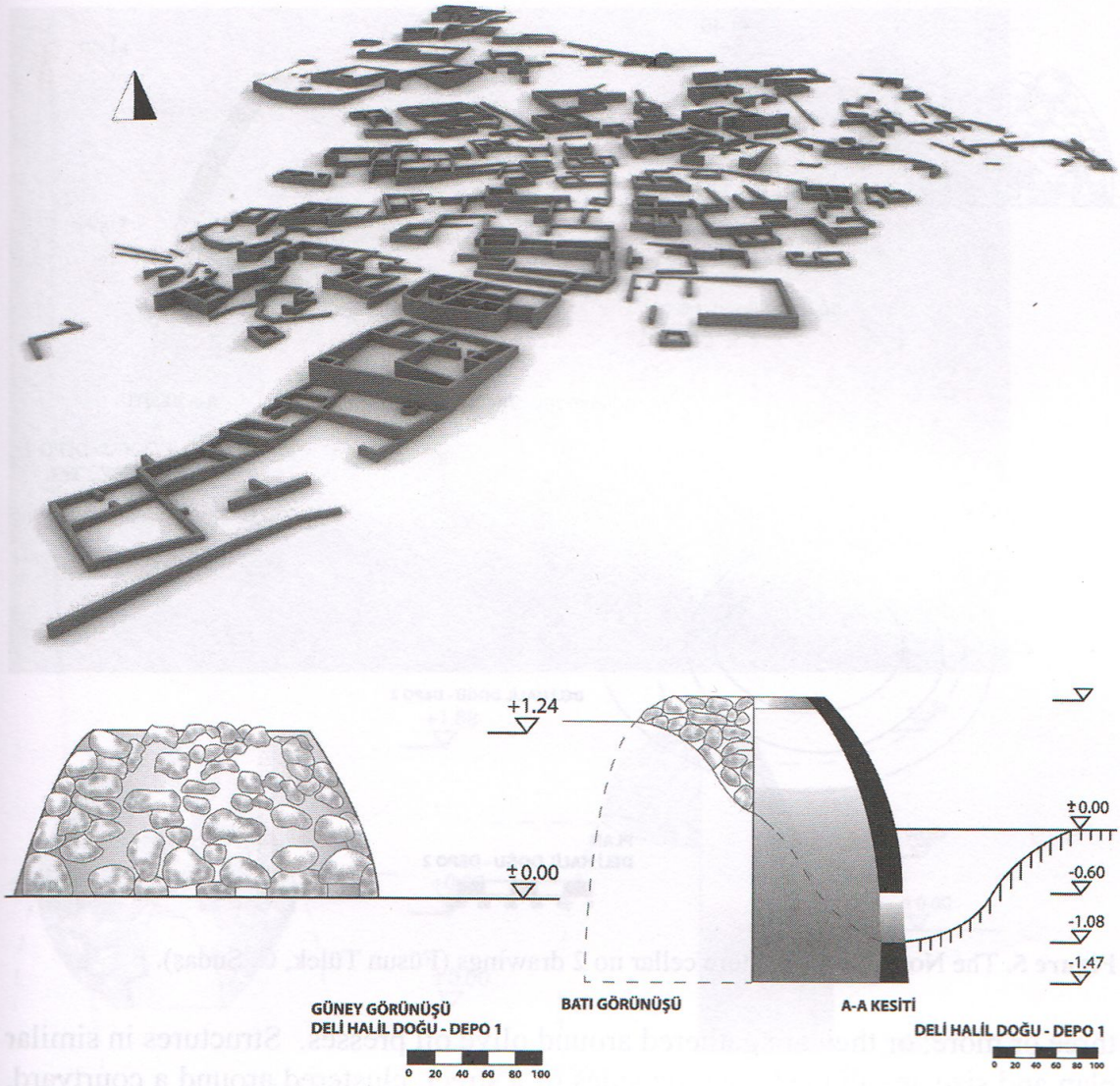


Figure 3. 3-D illustration of the West Section of the settlement. (Füsun Tülek, C. Sudaş).

Figure 4. The North Section, Store cellar no 1 drawings (Füsun Tülek, C. Sudaş).

from the 5th to the 7th centuries. Regarding existence of a temple, a necropolis and a well-planned layout of the settlement, the West section can be considered as the core of the Deli Halil ancient settlement. The settlement has a premeditated plan laid out on terraces to conform the topography (Figure 3); the streets intersect with each other at leveled areas forming clusters of insula. Rectangular structures placed on terraces and on both sides of streets are composed of at least 2 units with a walled enclosure, a courtyard. Most of these rectangular structures are interpreted as living spaces, houses. Almost all of them contain at least one, sometimes two or three, built-in round structures within their courtyards. Most of the courtyards contain at least one built-in round structure, possibly might have facilitated as cistern. In the West section, generally built-in round structures are clustered at open spaces like a plaza formed at the junctions of the streets in two,

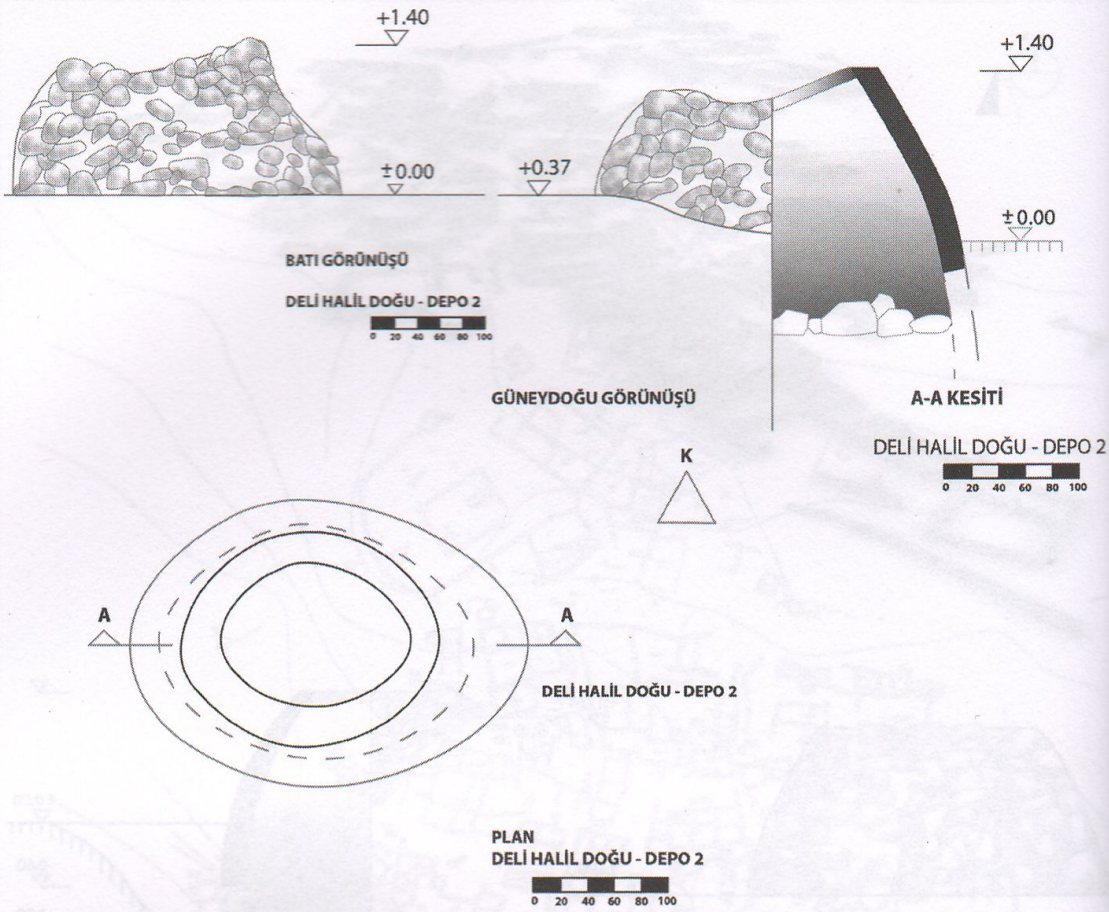


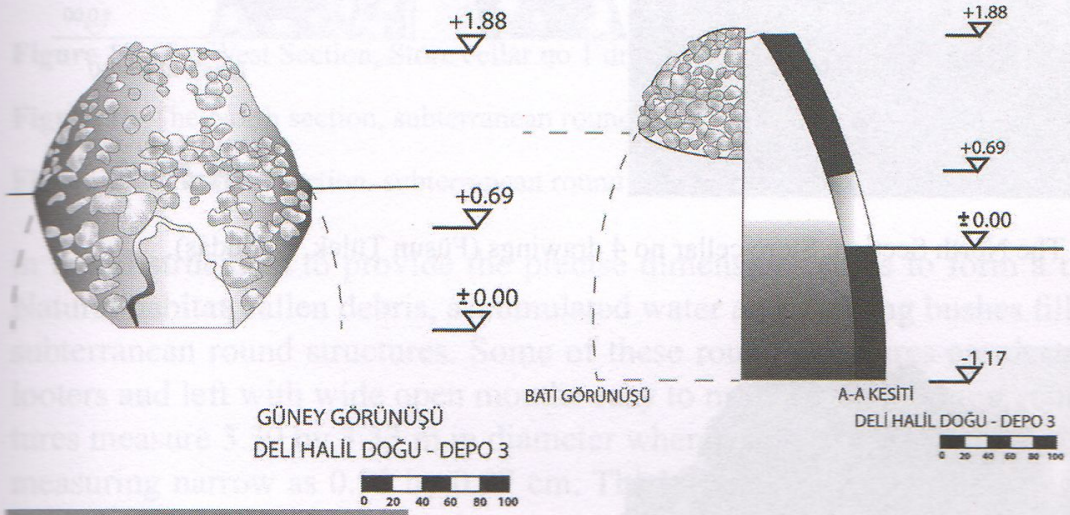
Figure 5. The North Section, Store cellar no 2 drawings (Füsun Tülek, C. Sudaş).

three or more; or they are gathered around olive oil presses. Structures in similar plan and size are aligned flanking sides of a street, clustered around a courtyard, or in an insula between intersections of streets. Thus, residential areas in the lay-out of the settlement can be distinguished. The year 2010 examination of the Sur-vey team documented 97 rectangular structures, 108 cisterns, 5 olive oil presses and 5 built-on round structures at the West section. A temple has been identified placed at the most prominent and visible spot of the settlement contained in a temenos enclosed by a peribolos with scattered fragments of column shafts and architrave fragments.

Round Structures

Ruins of the ancient settlement both at West and North sections contain in total 150 round structures built-in as subterranean structures, whereas round structures built-on ground (Figures 6, 9) totals up to 20 including those of the ruins at East section.[4]







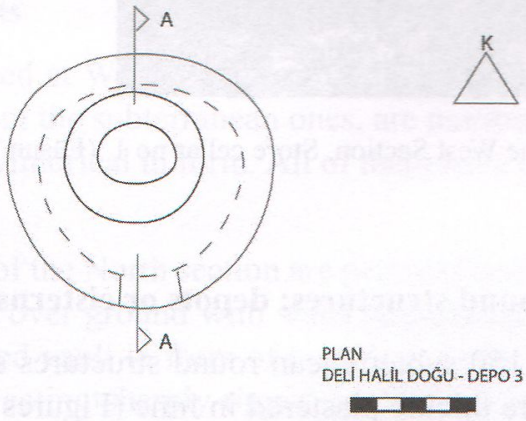


Figure 6. The North Section, Store cellar no 3 (Füsun Tülek).

Figure 7. The North Section, Store cellar no 3 drawings (Füsun Tülek, C. Sudaş).

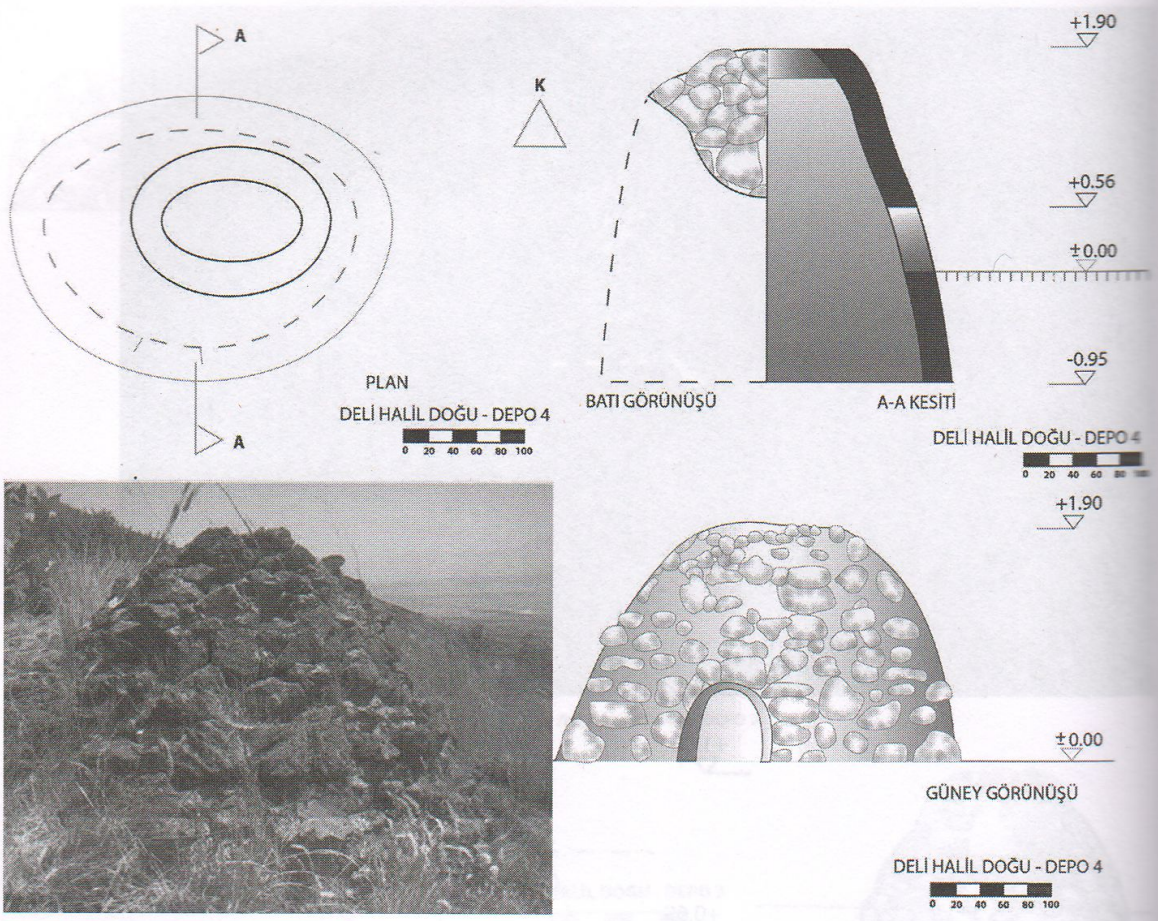


Figure 8. The North Section, Store cellar no 4 drawings (Füsun Tülek, C. Sudaş).



Figure 9. The West Section, Store cellar no 1 (Füsun Tülek).

Built-in round structures: depots or cisterns

All of the 150 subterranean round structures are built in with basalt and mortar and they are thickly plastered in lime (Figures 4-13). They are round in plan and have a body roughly cylinder in shape. Some of them have neatly defined square-shaped holes at the top. It is hardly possible to measure depth of these built-

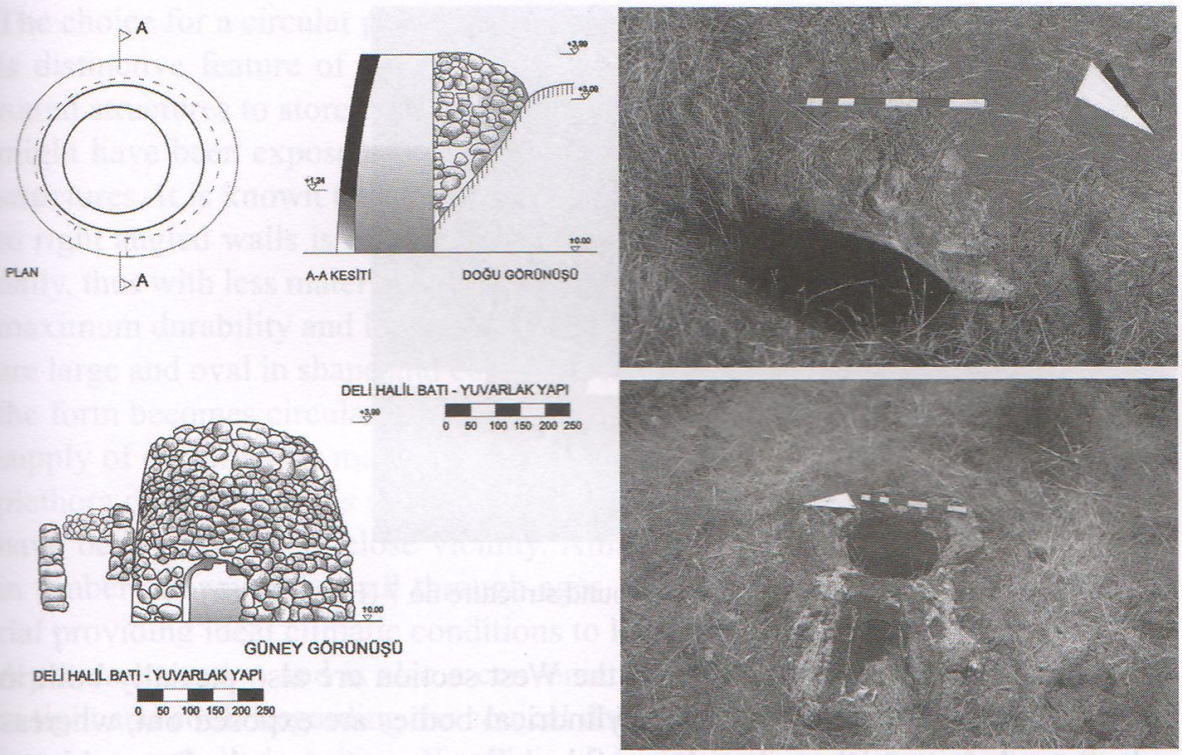


Figure 10. The West Section, Store cellar no 1 drawings (Füsun Tülek, C. Sudaş).

Figure 11. The North section, subterranean round structure no 37 (Füsun Tülek).

Figure 12. The West section, subterranean round structure no 39 (Füsun Tülek).

in round structures to provide the precise dimensions so as to form a typology. Natural habitat, fallen debris, accumulated water and growing bushes fill in these subterranean round structures. Some of these round structures are destroyed by looters and left with wide open mouths easy to measure. The largest round structures measure 3.30 by 3.33 m in diameter whereas intact ones have small mouths measuring narrow as 0.92 by 0.97 cm. The built-in round structures might have been facilitated as cisterns and some could have functioned as depots for grain, though.

Built-on round structures: depots

Standing round structures examined at West, North, and East sections, hereafter named as depots to distinguish from the subterranean ones, are numbered eleven. They are all circular in plan and cylindrical in form. All of them have an entrance facing inclination of the hill.

The six standing round structures of the North section are partially built in ground and two-thirds of upper parts rise over ground with walls slightly taper inwards having been covered with corbelled vault in form of a conical dome. The basalt stones corbel in smaller circles creating sharply tipped spectacular cone shaped domes. Roughly all of the depots measure 2,5 - 3 meters in diameter and 4 - 5 meters in height.

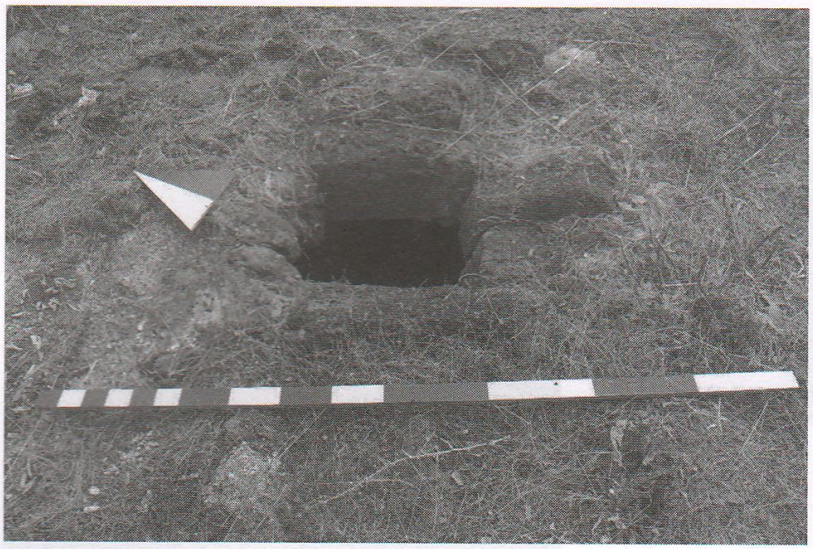


Figure 13. The West section, subterranean round structure no 7 (Füsun Tülek).

The five standing round structures of the West section are also partially built in ground. However, three sides of the cylindrical bodies are exposed out, whereas only one side leans to the rising slope of the hill, or in one case, the Depot 4 leans to the enclosure wall of the courtyard. Depot 1 is placed on the First Terrace and Depot 2 is at the temple temenos. They rise in cylindrical shape without curtain walls tapering inwards and they are vaulted more like a saddle-shape than a conical dome. However, Depot 3 and 4 have walls tapering inwards starting from the circular flat base. Thus, these two are thought to have conical domes similar to those of the North section. Among all, only Depot 1 of the West Section can be clearly measured as the looters dug it down to the original bottom level, which measures 5 meters in height and 3 meters in width.

It is noteworthy that masonry of the entire ancient settlement is in dry wall technique using amorphous basalt rocks put tightly together polygonal sides fitting with rough surfaces facing out. Masonry of the ancient settlement is reminiscent of archaic architecture in dry wall technique. On the other hand, both the built-in and built-on round structures have been built firmly with mortar and interiors have been neatly plastered with thick pinkish lime.

These round structures are too small to be houses or to be barns to shelter even a couple of sheep. They must have been used to store the most vital thing for the economy and livelihood of the ancient Deli Halil inhabitants. Significance of olive oil production for the ancient Deli Halil inhabitants has been conceived by existence of olive oil presses documented at least five of them at the West section. These depots might have been facilitated to keep produced olive oil in terracotta containers ready to export. At present interiors of these depots contain potsherds of terracotta containers, of some *dolia* type.

The choice for a circular planned structure built on ground to facilitate as a depot is distinctive feature of culture of the ancient Deli Halil inhabitants. Building round structures to store goods might have been inherent in their culture, or they might have been exposed to such a culture having a tradition of building round structures. It is known that technically constructing circular structures compared to right angled walls is easier since curvilinear walls distribute the weight internally, thus with less material and labor building firm and steady structures provide maximum durability and longevity (Radt, 1970). Structures built to shelter a herd are large and oval in shape and covered with ephemeral material. Smaller the size the form becomes circular for the convenience of the roofing. On the other hand, supply of construction material was not a problem for the Deli Halil locals since plethora of basalt rock is available in situ, as well as, limestone and timber could have been provided in close vicinity. Amanus Mountain range is a rich source in timber known widely all through ages. Besides, basalt is a convenient material providing ideal climatic conditions to keep goods in steady temperature for a depot construction and is also a convenient material for a cistern keeping water in tight and cool. Regarding the conical dome construction, circular curtain walls impose a corbelled vaulting. Small sized depots built circular in shape with corbelled vaults must have been the most suitable structures to store goods.

Round structures in Archaeological Context

Tradition of building round structures has a long past since hunter-gatherer period of mankind. Ephemeral material used for constructing shelters imposed form of the structure having curvilinear walls and wattle-and-daub roof. Round structures endured Neolithic and Bronze Ages; even became hallmark of a prominent Mesopotamian culture, namely Halaf culture.

Contemporaneously, Aegean Cultures yielded round structures and circular enclosures as open-air sacred sites. Circular planned burials covered with earth and or corbelled vaulting has also been observed from Late Bronze Age into Iron Ages such as, tomb of Atreus. Such tombs and round structures have also been documented in Lelegian towns of the Halicarnassus peninsula as part of the Lelegian traditional architecture dated to geometric and archaic periods (Radt, 1970). These Lelegian round structures are identified as round settlements or farmsteads, rather having round enclosures, round cisterns covered with corbelled vaults, oval houses and circular compounds 50 meters in diameter, probably were uncovered, and round burials namely *tumuli* in various sizes from 8 to 16 meters in diameter (Radt, 1970; Diler, 2005). Structures circular in plan named *tholos* in Greek architecture have also been observed in Roman times. Round temples, monumental tombs, and public buildings such as, market place or stock exchange have been built on circular plan supported with arches crowned by vaults or domes. Round structures constructed in several techniques for several functions are found at numerous ancient sites of the Classical period along the Mediterranean coast and

inland Anatolia, as well, such as Aezonai and Caunos (Naumann and Naumann 1973; Schmaltz 1997). In Rough Cilicia, in ancient city of Anemurium two round structures described as 'truncated cone' have been identified as burial chambers dated to the end of the 3rd century (Alföldi-Rosenbaum 1971). Similarly, a round structure unearthed at the acropolis of the Hellenistic city of Nagidos has been identified as a burial (Durugönül, 2007).

Round-shaped depots dug in ground have been unearthed in numerous settlements dating as of Late Chalcolithic period, such as on mound of Tell Turlu in North Syria (Del Olmo Lete, 1993). All through the Bronze Age depots in round shape built in ground frequented most of the settlements in Anatolia, Mesopotamia, and Levant. A survey, conducted on grain stores of Syria-Mesopotamian archaeological sites, lists numerous Bronze Age settlements yielding circular structures identified as depots. The stone-built platforms documented at the site of Arad, in Negev, Israel are of the Early Bronze II period (3000-2800) and they are elliptical in form *ca.* 4 meters in diameter. These structures are thought to have conical domes (Currid, 1986). In the Akkar plain of the Central Syria excavations of Tell Arqa yielded subterranean round structures used as depots dated to the Middle Bronze Age. Tell Arqa depots are bottle-shaped, built-in ground with corbelled stone masonry. Tell Arqa depots measure 1.50 to 1.60 meters in diameter and they are 1.80 to 2 meters deep. At the Hittite level of the Kaman-Kalehöyük in Central Anatolia numerous sunken round structures in various sizes facilitated as grain storage have been found. They are noted having flat circular bottom as the smallest measuring 2 meters in diameter and conical in shape.

Depots, round in shape also built on ground facilitated as grain stores are known in Egypt dating to the Early Bronze Age until the Roman period. An illustration of such an Egyptian depot demonstrates how grain was stored at the time of Pharaoh Thutmoses III, *ca.* 1460 BCE (Erman and Ranke, 1923). A study of round or elliptical structures of Palestine compared to the ones of Egypt and Crete suggests that these buildings should have functioned as granaries and or storehouses (Currid, 1985). With regard to storages built-on ground, as would be termed *Rundbau* depots by Wright who exemplifies an Early Bronze Age site Khirbet Kerak by Lake Tiberias in which nine depots arranged together built up in basalt ruble masonry look like beehive houses (Wright, 1985). Red and black burnished potsherds led Wright to presume that it is a culture coming from North from Anatolia which has built such structures otherwise, for him it is not the culture of Palestine to build beehive houses. Tell Qara Quzaq excavations in North Syria yielded round structures built on ground dating to the Middle and Late Bronze Ages identified as depots to store grain, as well. The depots of the Tell Qara Quzaq are identified by Del Olmo Lete as Syrio-Anatolian type (Del Olmo Lete, 1993).

Round structures in Vernacular Architecture

Present day examples of conical domed structures, namely 'beehive houses' are found in towns and villages in the Urfa province, such as Harran and Suruç (Akın, 1985). In towns of North Syria, Hama and north of Aleppo, structures with conical domes similar to those of the Urfa beehive houses are numerous. Almost all of these examples of vernacular architecture share a common feature as they have a rectangular plan and have a modular design cluster to form rooms of a house complex (Eres, 2010). On the other hand, round structures of the Deli Halil ancient settlement are circular in plan and they rise solitaire on ground. The conical domes of the Deli Halil ancient settlement are not juxtaposed on the risen walls of the structure as that of the vernacular examples but a continuous masonry corbels in gradually narrowing diameter to cover up the cylindrical body of the solitaire round structure. A recent study questions efforts to link round structures of vernacular architecture to those of the archaeological context mainly from Halaf period to the Classical times (Akkerman, 2010).

In vernacular architecture structures circular in plan and cylindrical in shape are found in vineyards of Midyat and they are named '*kokel*' or '*kımzah*' by the locals (Akın, 1985). Although, *kokels* are structurally similar to the Deli Halil depots *kokels* are not roofed by a corbelled vault but the cylindrical form of the structure is truncated by a flat roof. Archaeologist Del Olmo Lete who dug the Tell Qara Quzaq observed depots in use in contemporary Syrian architecture similar to the round depots uncovered at the archaeological context. Identical in shape and function with the round structures with truncated tops, namely the *kokel/ kımzah* of southeast Anatolia is the '*shomera*' of the Judaean desert vineyards existing in Wadi Jinan. The question whether these present day depots inherit round depot building technique as an enduring tradition since Classical ages is a subject of further investigation.

Standing round structures of the Deli Halil ancient settlement covered with conical domes or saddle-like vaults have no comparison in Cilicia Region. Round structures standing with conical domes have not yet been found in any of the excavated ancient settlements in Asia Minor. Function of the subterranean round structures are presumed to be both cisterns and depots whereas the standing ones are depots to keep harvest, possibly olive, but not grain for long term storage.

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ABBREVIATIONS

AA	Archaeologischer Anzeiger
AST	Araştırma Sonuçları Toplantısı
BA	Biblical Archaeologist
BANAE	British Association for Near Eastern Archaeology
IstMitt	İstanbuler Mitteilungen
KST	Kazı Sonuçları Toplantısı
TTK	Türk Tarih Kurumu
TÜBA-AR	Türkiye Bilimler Akademisi Araştırma Dergisi
TÜBA-KED	Türkiye Bilimler Akademisi Kültür Envanteri Dergisi
ZPDV	Zeitschrift des Deutschen Palaestina-Vereins

NOTES

1. Doç. Dr. Füsun Tülek, received PhD at Illinois University in 2004, is a faculty member at Kocaeli University since 2005. Tülek conducts the ongoing projects Osmaniye Archaeological Survey, and Mosaic Corpus of Bithynia and Paphlagonia. Tülek teaches courses in History of Architecture, Byzantine Architecture and Archaeology, and Underwater Archaeology. Settlement Archaeology of Roman and Medieval Plain Cilicia together with architecture and ceramics of the related periods are the major subject matters she is working on at present.

2. Osmaniye Archaeological Survey received the grant of the Scientific Research Council of the Kocaeli University in years 2008 and 2009 numbered 2008/18. Archaeological and geological examination of the Deli Halil ancient settlement was supported by a grant of the Tubitak- National Scientific Research Council numbered 109K025 in 2009 to 2011.

3. Archaeological examination of the site continues, however documentation of the structures has ended in 2012.

4. I hereby acknowledge the meticulous work of the team members of the Tübitak- Sobag 109K025 project, then architecture students at the Kocaeli University, Cerem SUDAŞ and Gökhan YAMAN who collaborated in drawings of the round structures standing on ground at the ancient settlement of Deli Halil in 2010.