

ARTIFICIAL CAVITIES OF GAZIANTEP (SOUTHEASTERN TURKEY)

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After the Hagia Sophia and Topkapi Palace of Istanbul (Turkey) underground structures project that we carried out in 2008–2009 as OBRUK Cave Research Group, we began to prepare “Gaziantep Underground Structures Inventory” offered us by Gaziantep Municipality and CEKUL Foundation in November 2011.

The aim of this project was to research, document, survey and making an inventory of the entire underground structure heritage which is within the borders of Gaziantep city and disappearing day by day because of the new constructions. It has been long known that Gaziantep, possessing a continuous inhabitation since 3000 BC, has hundreds of underground structures which were carved in sandy limestone. Some of those underground structures were used as storage facilities or cisterns, while some others are as yarn ateliers today. Furthermore, despite forming a huge and complex system, underground water structures whose small part can be researched due to destructions are another important phase of that project. This study will provide an assessment of the underground structures, aimed at protecting this cultural heritage. Additionally, it is known that some of the caves dug mostly in soft limestone may collapse. This inventory study will be a reference for the future for preventing such potential hazards. The abovementioned project is basically aimed at detecting, measuring, mapping and studying all underground structures in the old settlement area of Gaziantep, with an Autocad program. Thereby, the relation between all the underground and aboveground structures would not be lost. As a result of the studies carried up to date, 48 artificial caves and water structures have been explored and mapped. The project is planned to be completed by the end of 2013.

1. Introduction

As OBRUK Cave Research Group, we have carried out surveying and mapping of Hagia Sophia and Topkapi Palace underground galleries and chambers at Istanbul during the years 2008–2009, headed by Dr. Çigdem Aygun. It can be accepted as a milestone that those structures, having great historical importance and heritage, have been researched by expert cavers without producing any harm through using “Single Rope Techniques”. Within the scope of this project, 32 underground cisterns have been measured and mapped in the Historical Peninsula of Istanbul, and a total length of 2,000 m of tunnels has been explored and measured.

After this project and another study carried out in Hasankeyf’s underground structures in March 2010, a project was offered to our group for the exploration of underground structures at Gaziantep (Fig. 1). The basics of the project and how to apply it were planned during the following meetings. After signing the protocol between Gaziantep Municipality and CEKUL Foundation, the studies were launched in the city.

2. Execution of the Project

- At the beginning of the study, a main zone was selected in the city. This study zone was indicated by Gaziantep Municipality and CEKUL Foundation together.
- In the first stage; all underground structures in the main zone, which had been already known, were detected and underground studies started.
- In the second stage, all detected underground structures were measured and processed into the main city plan. Water structures, on the other hand, were searched for level and directions besides architectural measurements are processed into a surface map accordingly, by taking

surface related points as reference.

- The local people were constantly communicated and all notifications were taken into consideration. As a result of the whole information, the first detected fields were crossed and various studies in different regions were carried out.
- During the study, plans, features and photographs of each underground structure were recorded as the separate tags. Structures and tunnels were processed into the map.
- The project is coordinated by OBRUK Cave Research Group’s architect-cavers.

3. Geology of Gaziantep

The geological units near and around Gaziantep can be classified in three groups:

3.1. Gaziantep Formation

This unit comprises limestone and chalk. The places where the most typical outcrops are seen are Gaziantep and its surrounding area. It is mixed with Firat Formation in the region. Although it is mostly consisting of soft rocks as argillaceous limestone and chalk limestone, thicker layered massive limestones can also be found. Argillaceous limestones comprise whitish, grey and yellow, loose and thin-middle layered and chalky levels. The unit is dated as Upper Eocene–Middle Eocene (MTA 1997).

3.2. Firat Formation

This formation crops out in discordance with Gaziantep Formation. The formation starts with a thick layered limestone with cream, white and yellow in the lower part



Figure 1. Project area.

and goes on with more fossiliferous limestone above. In the upper formation, it comprises thick layered limestone. Limestones are generally fractured, and the fractures are filled by calcite. Firat Formation is of Miocene age.

3.3. Yavuzeli Basalt

This Middle-Upper Miocene formation can be found in the south of Gaziantep. It generally comprises lava flow, which is dark brown to dark gray and blackish. Despite its large outcrop area, it presents thickness ranging between 10 m and 50 m.

4. Tectonics

The East Anatolian Fault, one of the most important faults in Turkey, extending from 50 km north of Gaziantep to the west, and the Dead Sea Rift, which is below this fault from the south to the north, still resume their activities in Turkey. These main faults and all the minor faults between them are active. It is known that, as a consequence of the strong earthquakes in 1526, 1760 and 1822, most of the buildings in Gaziantep were destroyed (Ambraseys and Finkel 1995).

5. Artificial Underground Structures of Gaziantep

48 artificial cavities which were detected in Gaziantep up to now can be classified into 2 groups.

The first group is the underground water structures which were widely used in the past. There are numerous water resources around the plateau where Gaziantep is located. Despite all these resources, there is no water table under the city. Therefore, long tunnels were dug a long time ago in order to bring water to Gaziantep.

To date, some 700 m of the total tunnel length have been explored and several shafts have been investigated. These tunnels, which are for miles and called “*livas*” locally (Fig. 2), are very similar to the ancient “*qanat*” or “*karez*” which were initially realized 2000–3000 years ago in Iran and can today be seen in many countries like Morocco, Algeria, Egypt and China (Wessels 2000; Castellani 2001). The tunnels of Gaziantep some of which are longer than 7 kilometres carried the water from the springs to the town.

There are numerous shafts (or wells) opened from the surface to these tunnels. Unfortunately, the modern settlements in Gaziantep seem to have destroyed most of these shafts and wells.

Apart from these shafts; other underground structures peculiar to Gaziantep are represented by washing pools which are connected to the surface with stairs, and by public places with small baths and lavatories. These public water areas, locally called “*kastel*”, were mostly built near the mosques. Although there were at least 15 “*kastels*” until 50 years ago, only 5 examples remain today (Çam 1982).

Nevertheless, the remaining structures give an idea about the impressive architecture of these interesting underground features. Among these structures, Pisirici (Fig. 3) is one of the oldest, together with an underground mosque built in 1283. The “*livas*” bringing water to this structure cannot be precisely followed due to subsidence in the area. Among the other “*kastel*”s, only Ahmet Celebi Kastel, with a slight change, fits for purpose.

The remaining 3 kastels; İhsan Bey, Kozluca and Nadir Bey, are unprotected and have been the victims of wrong modifications.



Figure 2. A typical “*livas*” under Gaziantep (photo: AE Keskin).

Various water tunnels (*livas*) likewise the ones in Gaziantep War Museum Cave, Tütün Han Cave, Fethullah Mosque Kastel and Ömer Ersoy Culture Centre are all connected to the same underground water system. On the other hand, it was also found that many shafts searched during the project are also connected to those water tunnels. For example, there are two different tunnel connections in the depths of a 44 m deep well of the American Hospital.

Additionally, the soft limestones of Gaziantep are particularly suitable for digging tunnels and other underground structures. Nearly all of the old houses have an underlying cave used as storage (Çanakçı and Güllü 2004). The stones coming out as a result of the excavation were used in the construction of the upper structure. Though most of the caves explored and mapped up to now belong to this group, there are some extraordinarily large structures which were excavated as quarries and then used as yarn or ceramic factories. For



Figure 3. Pisirici Kastel (photo AE Keskin).

example; Akbulut Cave, used as an underground ceramic factory for a long time, covers a total area of 9,500 m² and is one of the largest artificial cavities of Turkey. On the other hand, Uzumcu, Iplikci and Sulu caves are still being used as yarn ateliers.

As to mention Cemetery Caves (Figs. 5 and 6), it is a gigantic system located under the modern cemetery of Gaziantep, a total area of more than 60,000 m², with 14 entries and used

as a yarn manufacture and barn previously. It can be considered as the largest known artificial cavity of Turkey.

The unique example different from the two groups of underground structures mentioned above, is represented by the tunnels located under the Castle of Gaziantep. These tunnels, with a total length of 280 m, reach the cisterns at the bottom. Age of the tunnels is unknown, but archaeological researches are continuing at the castle.



Figure 5. Plan of Cemetery Caves of Gaziantep.

6. Future of Artificial Cavities in Gaziantep

Gaziantep is probably the richest region in terms of historical underground structures of Turkey after Cappadocia. Most of the structures that we surveyed during this project either continue to be used for their original purpose or have a new function as a cafe or restaurant. Yeni Han and Tutun Han caves are beautiful examples of those underground structures which are used as cafes today.

Traditional yarn manufacturers still continue to work in some caves. It will be a preferable application that this branch of business, having an ancient tradition, would maintain its activities in the same places after the restoration of their caves.

Furthermore, Gaziantep Municipality is looking forward at the end of this project, to have useful information about the future usage of the empty Akbulut Cave, Copper Market Cave or Cemetery Caves.

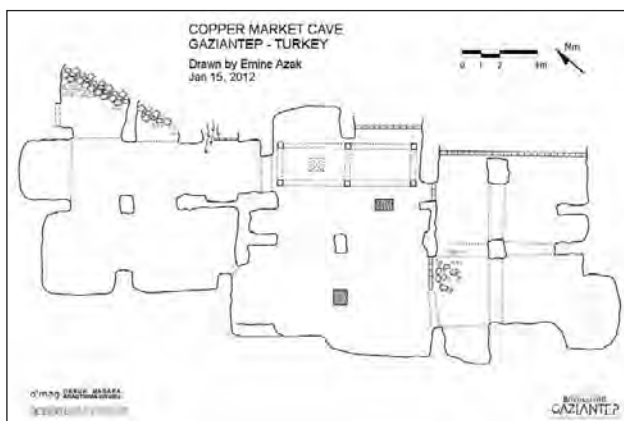


Figure 4. Plan of Copper Market Cave.



Figure 6. Cemetery Cave A5 Main Gallery (photo AE Keskin).

On the other hand, some protected parts of the underground water systems, namely “*livas*” and “*kastel*” will be restored and open to public.

Our main purpose is to protect the available underground structures of Gaziantep and transfer them to the next generations.

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