Evaluation of Underground Cities in Nevşehir and its Surroundings in Terms of Cultural Geography*

Nevşehir ve Çevresindeki Yeraltı Şehirlerinin Kültürel Coğrafya Açısından Değerlendirilmesi

Elif KAHYA YILDIRIM**

Abstract

Underground cities have survived to the present day, shaped by the influence of many cultures. In this study, it is aimed to evaluate the underground cities, which have been used by many individuals, societies and groups from ancient times to the present, in terms of cultural geography. The study area determined as Nevşehir and its surroundings effectively reflects the natural and cultural characteristics of the Ancient Cappadocia Region. The main settlements in the study area are Nevşehir Center, Ürgüp, Avanos, Gülşehir, Acıgöl, Derinkuyu districts and Gülağaç and Güzelyurt districts of Aksaray province. In the study area, the northwest of Ürgüp in Nevşehir, the north of Derinkuyu, and the surroundings of Güzelyurt and Gülağaç in Aksaray have been identified as areas where underground cities are concentrated. As a result of literature analysis and observations made in field studies, the human-space relationship in underground cities was analyzed within the framework of concrete cultural elements. The research method that has a fundamental impact on the process of obtaining and analyzing data is field work. The main underground cities observed through field work are Derinkuyu Underground City, Kaymaklı Underground City, Özkonak Underground City, Güzelyurt Underground City and Tatlarin Underground City. These underground cities were examined together with their surroundings; geographical and cultural evaluations were made.

Keywords: Nevşehir, Cultural Geography, Ancient Cappadocia, Underground Cities.

Öz

Yeraltı şehirleri, çok sayıda kültürün etkisiyle şekillenerek günümüze ulaşmıştır. Bu çalışmada, Antik dönemden günümüze pek çok birey, toplum ve grup tarafından kullanım görmüş yeraltı şehirlerinin kültürel coğrafya açısından değerlendirilmesi amaçlanmıştır. Nevşehir ve çevresi olarak belirlenen çalışma alanı, Antik Kapadokya Bölgesinin doğal ve kültürel özelliklerini etkin bir şekilde yansıtmaktadır. Çalışma alanındaki başlıca yerleşmeler, Nevşehir Merkez, Ürgüp, Avanos, Gülşehir, Acıgöl, Derinkuyu ilçeleri ile Aksaray ilinin Gülağaç ve Güzelyurt ilçeleridir. Çalışma alanında Nevşehir'de Ürgüp'ün kuzeybatısı, Derinkuyu'nun kuzeyi, Aksaray'da Güzelyurt ve Gülağaç çevresi yeraltı şehirlerinin yoğunlaştığı alanlar olarak tespit edilmiştir. Literatür analizi ve arazi çalışmalarında yapılan gözlemler sonucu yeraltı şehirlerinde insan-mekân ilişkisi, somut kültürel öğeler çerçevesinde analiz edilmiştir. Verilerin elde edilmesi ve analizi sürecinde temel etkiye sahip olan araştırma yöntemi arazi çalışmasıdır. Arazi çalışmasıyla gözlemlenen başlıca yeraltı şehirleri Derinkuyu yeraltı şehri, Kaymaklı Yeraltı Şehri, Özkonak Yeraltı Şehri, Güzelyurt Yeraltı Şehri ve Tatlarin Yeraltı Şehridir. Bu yeraltı şehirleri çevreleriyle birlikte incelenmiş; coğrafi ve kültürel değerlendirmelerde bulunulmuştur.

Anahtar Kelimeler: Nevşehir, Kültürel Coğrafya, Antik Kapadokya, Yeraltı Şehirleri.

Introduction

Culture is a concept addressed by many disciplines. Each discipline that focuses on culture in its studies has adopted different approaches. The difference in approach in cultural studies has also been observed among cultural geographers. The main reason for this situation is the differences between traditional cultural geography, cultural turn and new cultural geography.

The Berkeley School has an important share in the development of Cultural Geography. This school was put forward by C. Sauer (1889-1975) in line with the human ecology approach and principles developed by H. Barrows (1877-1960). This approach, which focuses on the concept of landscape and is called "Landscape Ecology", has dominated the discipline of geography for many years and formed the basis of cultural geography (Arı, 2005: 7).

* This Study Was Produced from The Author's Doctoral Thesis Titled "Cultural Geography of Nevşehir and its Surroundings".

** Dr.Öğr.Üyesi. Niğde Ömer Halisdemir Üniversitesi, elifkahya@ohu.edu.tr, ORCID: 0000-0003-4990-9816.

Kahya Yıldırım, E. (2025). "Evaluation of Underground Cities in Nevşehir and its Surroundings in Terms of Cultural Geography", *Asia Minor Studies*, Cilt 13 Sayı 1, 77-105, Gönderim tarihi: 12-11-2024, Kabul tarihi: 10-01-2025.

Araştırma Makalesi.

The founder and most important intellectual architect of American traditional cultural geography is Carl Sauer (1889-1975). Sauer argued that the main thing to look at and understand is culture, and the main subject of geography to study is landscape. Sauer (1925) established spatial relationships between phenomena and aimed to reveal the distribution of landscape on the earth's surface and the meanings of its structural features. Another aim of Sauer is to reveal the changes that occur in the landscape over time by collecting information about a region with the landscape morphology approach (Sauer, 1925; Schein, 2004; Kaya, 2015).

The influence of traditional cultural geography, which gave rise to many areas of expertise such as cultural ecology, political ecology and historical ecology, ended in the 1980s. After the criticism directed at traditional cultural geography, it turned into a major movement called "cultural turn" and its impact within geography began to be seen. The cultural turn, on the one hand, has brought about new approaches in human geography studies and, on the other hand, has provided the birth of a new cultural geography (Kaya, 2015: 631).

New cultural geography is undoubtedly the most concrete reflection of the cultural turn within geography. New cultural geography differs from Sauerian cultural geography in many ways. At the basis of the distinction lies the critical approach that centres on the concept of culture. The cultural turn has also made the spatial turn in geography effective; the spatial perspective has also become important in other social and human sciences. The cultural and spatial turn has been influential in the discipline of geography as processes that break down interdisciplinary boundaries and enable productive interactions. On the one hand, the cultural and spatial turn and on the other hand, the interdisciplinary approach have diversified the research topics of the new cultural geography and ensured that quite different trends find a place in the discipline (Schein, 2004: 12).

The discipline of cultural geography analyzes the cultural relationships between people and space. This discipline provides an in-depth understanding of social identity, historical processes and human-environment relations by analyzing the reflections of culture on space. In this respect, the approach offered by the discipline of cultural geography is different from other geographical approaches.

In this study, underground cities in Nevşehir and its surroundings were examined from a cultural geography perspective. Addressing underground cities from this perspective is important in contributing to the understanding not only of their geological or touristic features but also of their cultural context at the time they were built and their current status. In addition, with this approach adopted in the study, it was aimed to highlight the cultural function of the space and the role played by underground cities in social and economic relations.

The main questions that are aimed to be answered in the study developed for this purpose are as follows;

What are the historical, social and cultural aspects of underground cities?, How influential were war, security, religious and economic reasons in the emergence of these settlements?, What was religious and social life like in the underground cities?, Through which structures and structural units can this experience be observed?, What economic activities did the production, processing and storage areas in underground cities contribute to?

These questions enable us to understand the cultural and social dynamics of the people who built and lived in underground cities.

Cultural geography studies, which are based on the mutual interaction between humans and the environment, are the main sources on which this article is based. Sauer's work “The Morphology of Landscape”, which opposes environmental determinism, has a very important

place in the sub-discipline of cultural geography. Sauer (1925, 1952) stated that the existence of geography in the interaction between humans and the environment should be emphasized in his studies. Establishing spatial relationships between phenomena, Sauer (1925) aimed to explain the distribution and structural features of the landscape on earth. Another aim of Sauer is to reveal the changes that occur in the landscape over time by collecting information about a region with the landscape morphology approach. Carl Ortwin Sauer's works have been a guide for researchers working on cultural geography in later periods. Duncan et al. (2004) are the changes in cultural geography in the 20th century, the analysis of the basic approaches that guide cultural geography studies, and some important thematic areas contributed by cultural geographers. This work, titled "A Companion to Cultural Geography", detailed in a series of articles, emphasizes that cultural geography cannot be separated from other branches of Geography. In this regard, the focus is on the dialogue that cultural geographers establish with geographers who conduct political, economic, historical and social studies. Birkeland (2008), in his study on the relationship between culture-nature and society-space, deals with the conceptualization of the subject of "culture" within "cultural geography". Wu (2010), who emphasized cultural ecology, one of the main topics of cultural geography, supported the explanation of the cultural landscape with Sauer's definitions. In his study, he revealed that the landscape is becoming increasingly cultural and the effect of this situation on the ecosystem. Referring to the subjects of Sauer and the Berkeley School in his study, Hannam (2015) emphasized the cultural evaluation of the geography discipline. In the study conducted by Gibson and Wait (2020), the focus was on depicting the geographical space from a historical perspective. Studies on cultural geography in Turkey have increased in recent years. Karakuzulu and Atnur (2007) examined the Turkish people's perception of Tortum, Çıldır and Tödürge (Demiryurt) lakes in Anatolian legends in terms of cultural geography. Focusing on traditional houses and the influence of culture in the construction of these houses, the study of Kayserili and Altaş (2010) deals with the evaluation of rural dwellings in Horasan district in terms of cultural geography. In this study, cultural region, cultural diffusion, cultural ecology, cultural interaction and cultural landscape, which constitute the main subjects of cultural geography, constitute the subheadings of the study. In the study conducted by Gök and Kayserili (2013), it was aimed to reveal the reflections of the cultural accumulation and cultural landscape that the people living in Erzurum brought from past to present on the residential culture. One of the aims of this study is to turn the physical geographical conditions of the city of Erzurum in favor of the city. Kocaman, Kayserili and Kaya (2015), in their study aiming to reveal the reflections of the cultural accumulation and cultural landscape from past to present on the residential culture in Kağızman, also focused on determining the issues related to reducing the negative effects of topographic and climatic factors on residences. The study conducted by Kahya (2023a) aimed to analyze the cultural landscape of Ihlara Valley in terms of cultural geography. In the study developed in this direction, the cultural landscape values of Ihlara Valley were reflected in a natural, historical and cultural framework. The study by Aydoğan Tatar and Aydın (2023), in which they aim to reveal the concrete and intangible cultural values of the region in the historical process in line with the general geographical characteristics of Karamürsel District (Kocaeli), is among the studies done on this subject.

As a result of the literature review and document analysis, it was seen that the issues emphasized by the Cultural Geography sub-discipline were generally highlighted in previous studies. In cultural geography studies conducted in Turkey, researchers focused on residential culture. The main reason for this situation is that the cultural-geographical view that emerges as a result of people's perception of the environment and changing it in line with their needs and expectations can be observed in the best way through architecture. The underground cities, which are the focus of this study, have an important place in the cultural heritage of Nevşehir and its surroundings, which stand out with their natural structure. It has been observed that the

studies (Bixio, 1994; Bixio et al., 2012; Ayhan & Ulusay, 2003; Ayhan, 2004; Kaya, 2005; Ceylan, 2021) on underground cities in the region were developed focusing on geology and tourism issues. Kocalar's studies (2018a, 2018b) identified tourism-related conservation and use problems of underground cities in the region and offered solutions for conservation. In this context, the gap that is intended to be filled in the literature is that underground cities, which maintain their importance in almost every period of local life, have not been evaluated as a cultural place. This evaluation, made from a geographical perspective, aims to fill the gap in the literature.

The basic approach prioritized in this study was shaped in line with addressing the natural structure-human relationship as required by cultural geography research. In the study developed in this direction, human impact is centered on the development of underground cities in terms of their location, formation and functional characteristics. In the findings section of the study, the data obtained in the research were evaluated under six subheadings. The history of underground cities in the study area, their functions, distribution, structural units, daily use areas and prayer areas, relations with trade and mining activities are the issues evaluated in the findings section.

The Ancient Cappadocia Region stands out in Turkey as an area where volcanic eruption centers, landforms and rocks cover a large area. This area was formed by volcanic activities that took place over a period of time spanning the last 16 million years. The volcanic rocks that give the region its general character have spread to the earth from very important eruption centers (stratovolcanoes) such as Erciyes Mountain, Hasan Mountain and Melendiz Mountain, which are also volcanic complexes, and some of them have spread to the earth from other large volcanic complexes such as Acıgöl and Göllü Mountain (Doğan, 2021: 4). Volcanism effective in the region creates a high plateau covered in horizontal layers several hundred meters thick, covered with lava and volcanic tuffs. The ease of cutting and excellent thermal insulation properties of these soft volcanic tuffs have been the main reason for the establishment of an underground settlement in this region from ancient times to the present day (Erguvanlı & Yüzer, 1977: 15). The fact that the tuff that forms the rock layer in the region is very soft and dries when exposed to air, allowed people to live in underground settlements without being disturbed by humidity.

Bixio and Castellani (1995) divided the underground cavities in the region into two: “natural cavities” and “artificial cavities”. Artificial cavities are divided into two groups. Fairy chimneys, rock churches, rock tombs and dovecotes form hillside settlements; underground cities and water tunnels constitute underground structures (Ayhan, 2004: 28). All of these artificial cavities are rock settlements of the “Cappadocia Region”.

When cliff entrances are located within the sloping walls and peaks from which they reach valleys, protected cities have been excavated to include wide open areas of flat platform with little or no ground elevations. The transition from the ground floor to the lower floors is provided by steeply descending tunnels and gradual vertical shafts. On each floor there are rooms, warehouses, cisterns and niches connected to each other by corridors. In this way, a complex, horizontal network of underground cities was created (Bixio, 1994: 49). The places called “underground cities” in Nevşehir and its surroundings are generally formed by carving soft tuff on the valley and plateau slopes and develop underground. Underground cities are one of the most important representatives of civilian life in the region.

The name underground cities is used for underground settlements that develop by carving the soft tuff underground. However, all academic studies agree that these settlements do not have permanent settlement status. At the same time, it is not clarified how long it was inhabited and the number of people living there. For this reason, it is not correct to describe all

the underground settlements in the region as having a city function. It is thought that these places, which are mentioned with names such as “underground caves”, “underground shelters”, “underground settlements” in various sources, may have been called “cities” from a touristic perspective. Yörükoğlu et al. (1990) named underground settlements as village-town and city due to their capacities. For example, the Yallı Damı, Ayazma, Ören (Yeşilöz) underground settlements located near the Belha Monastery in Özkonak are referred to as “underground villages”, and the larger complex Derinkuyu, Kaymaklı, Mazı, Özkonak underground settlements are referred to as “underground cities”. Although it is not correct to call all settlements cities because the number of people hosted by an underground settlement is not certain, the settlements are called “Underground Cities” because the concept of underground cities is widely used and some of them are large enough to accommodate thirty thousand people (Gülyaz & Yenipınar, 2003: 38).

Bixio et al. (2012: 13) divided the underground areas in Cappadocia into three in terms of settlement typology. These are natural caves developed by natural events, occasionally containing anthropological remains, Anthropized caves (natural caves partially modified by humans), and cavities completely dug by humans (Artificial/Anthropic cavities). The most developed and common among these are artificial cavities.

The Ancient Cappadocia Region has many geological and geomorphological heritage that can be evaluated from scientific, educational and aesthetic perspectives. The region, which hosts important volcanic mountains such as Erciyes and Hasan Mountain, as well as rare landforms such as fairy chimneys, is also very important in terms of its geopark potential. Geoparks, which play an active role in promoting the integrity of the landscape, emphasize the need for sustainability of resources and geographical character (Akbulut & Gülüm, 2012: 415; Kocalar; 2020: 178: Kocalar, 2021: 29). Volcanic mountains, valleys covered with fairy chimneys and rock churches, underground settlements in the region indicate the natural, cultural, architectural, historical and archaeological importance of the area that can be considered as a geopark. The underground area has an important place in the cultural landscape of Nevşehir and its surroundings. Underground settlements unique to the ancient Cappadocia region are living spaces carved into soft tuff rocks, protected by millstones. These settlements, where various units are connected to each other through tunnels, were created for protection purposes. Aksaray, Niğde, Kayseri, Kırşehir and Yozgat in the Ancient Cappadocia region, especially Nevşehir, are the areas where underground settlements are most common (Bixio, 2002; Bixio et al., 2012; Ayhan, 2004; Yamaç et al., 2015). Underground settlements with thousands of rooms, corridors, galleries and paths deep underground are large enough for 5,000-30,000 people to live (Yörükoğlu, 1990: 7).

In geological and geographical terms, the area called Central Anatolia Volcanic Region, Cappadocia Volcanic Field and Cappadocia Volcanic Plateau covers an area of approximately 20,000 km² with many well-preserved volcanoes, volcanic ash fillings and lava flows. In addition to this morphological evaluation, within today's administrative borders, the region is evaluated within a spread area that we can define within the scope of Nevşehir in the center, Niğde and Aksaray in the west, and Kayseri in the east (Doğan, 2021: 1; Güngördü, 2023: 2). The core area of the region, which was called “Cappadocia” in ancient times and had very wide borders, is today characterized by some settlements in Nevşehir and its surroundings. The settlements determined as the study area in this research are Nevşehir Center, Ürgüp, Avanos, Gülşehir, Acıgöl, Derinkuyu districts and Gülağaç and Güzelyurt districts of Aksaray province (Figure 1).

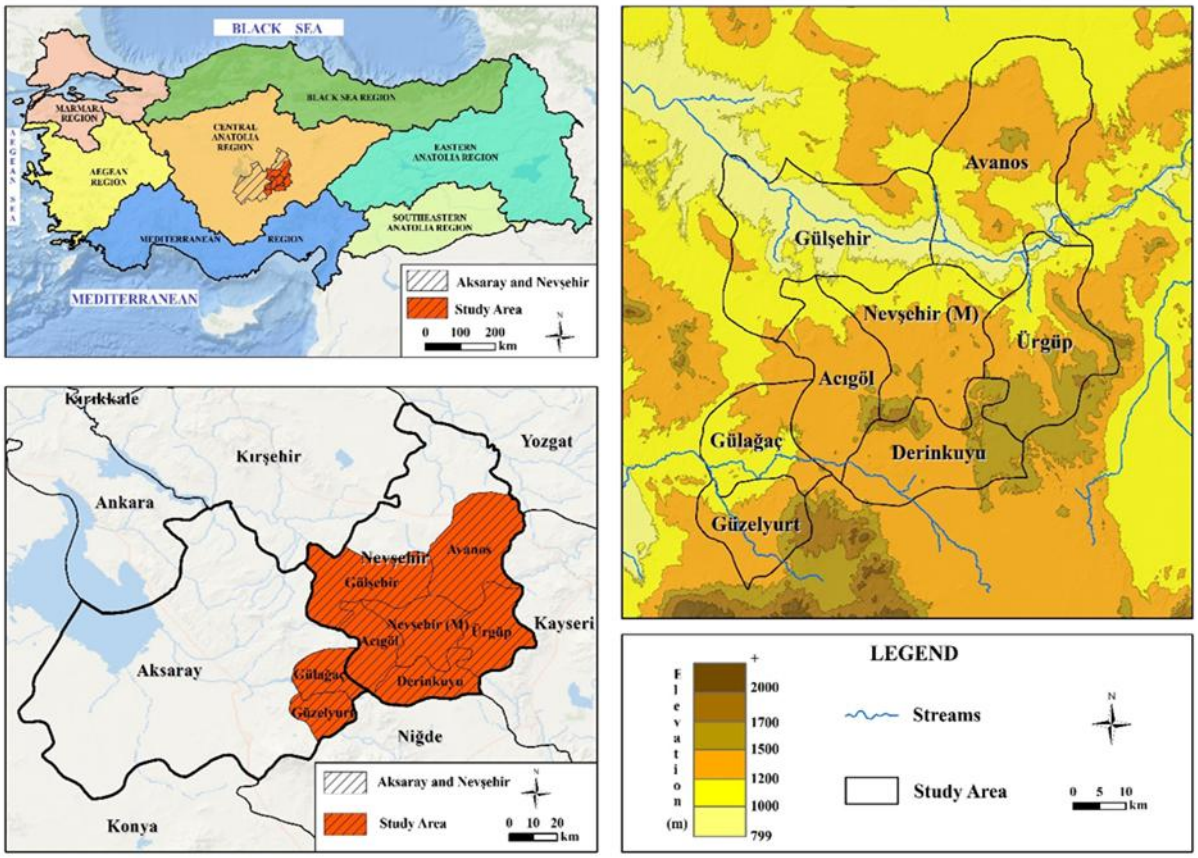


Figure 1: Location of the Working Area

Material and method

The underground cities located in the "Ancient Cappadocia Region", which has a deep-rooted cultural history, are the result of the mutual interaction between people and space. Man's ability to perceive and interpret nature has enabled him to shape natural areas in line with his needs and expectations. Underground cities, which are residential areas created in this direction, are discussed in the study from a cultural geography perspective. In the study, which includes the distribution and concentration areas of underground cities in Nevşehir and its surroundings, underground cities are examined within the framework of their functional features, main units and areas of use. The study, prepared using various geographical methods and techniques, was designed based on literature analysis, field work and observation. Monographic sources obtained as a result of literature research on the formation and history of underground cities were used. It is important in document analysis to determine which of the relevant documents is important within the scope of the research problem and can be used as a data source (Yıldırım & Şimşek, 2008: 188). In this respect, the problematic of the research played a leading role in determining the analyzed documents and providing data.

Field studies played an important role in obtaining data related to the study. Field studies, which form the basis of data collection in geographical research, enable direct observation of people's interactions with the natural environment. For this reason, field research are important in terms of supporting cultural transfer and spatial results in both physical and human geography research (Kahya, 2023a: 206). The data obtained as a result of the field study has a fundamental impact on the analysis of the study. In the field studies carried out at various times between 2020-2023, Derinkuyu Underground City (February, 2020), Kaymaklı Underground City (February, 2020), Özkonak Underground City (February, 2023), Güzelyurt Underground City (August, 2020), Tatlarin Underground City (February, 2023) were examined

together with their surroundings and geographical and cultural evaluations were made. Observations made within the scope of field studies were carried out regarding the areas where underground cities spread, their current situation, their relationships with their environment, and the spaces shaped in line with cultural use. The culture-space relationship was directly observed in the field, and photographs were taken in the interior and exterior of the underground cities. Relevant photographs have been added to the study.

ArcMap 10.4 software was used to create maps of the research area. In the creation of maps, figures and tables, Google Earth data, data and numerical values belonging to the Republic of Turkey Ministry of Culture and Tourism, Nevşehir Provincial Directorate of Culture and Tourism were used. In the study, the map showing the locations, distributions and concentration areas of underground cities was arranged in line with the data obtained from Ayhan, 2004, a monographic source, and supported by field studies.

Results

Historical Background

Today, there are many sources on the history of the "Ancient Cappadocia Region". However, these sources do not contain clear information about the history of the underground cities spread in the region. Stea and Turan (1993: 169) stated that the practice of rock carving to create a living space in the region occurred long before Christianity spread to the region. So much so that he associated the reason why Christian immigrants chose this region as a living space with their knowledge of the existence of these settlement practices.

The biggest development in underground settlement culture was in AD. It took place between the 6th and 16th centuries, that is, during the Christian period. This situation, concretized by a large amount of evidence, is accepted by most scientists. Kostof (1972: 50) said that "there is no reason not to believe that the practice is older". Although there are other academic studies (Yörükoğlu et al., 1990; Kaya, 2005) that contain similar ideas to this view, there is no direct evidence showing that the dating dates back to the pre-Christian period.

Yörükoğlu et al., who made a connection with people's first houses and the way they settled in houses (1990: 78) compared underground spaces with Neolithic period houses and stated that they were very similar in terms of usage. Although this assumption is based on the fact that the houses are built adjacent to each other, entrances and exits are provided from the roof, and the existence of tunnel-like units, there is no finding supported by archaeological data that can be used to date the underground cities.

The geographical proximity between underground settlements and mounds, which are neolithic settlements, is striking. Most of the underground settlements are 300-500 m deep. near or 1000-2000 m. There are mounds in the distance. Sometimes there are mounds located at the midpoint, equidistant from several underground settlements. Particularly located in the town of Acıgöl, the mound seems to be built almost on top of an underground city. An underground settlement is located opposite the huge Hittite hieroglyphic rock inscription (Topada Inscription) near the Ağırlı Village, also located in the south of Acıgöl town, 500 m away. The large Karahöyük is located in the south (Yörükoğlu et al., 1990: 13-14).

Another example of the underground settlement-mound connection is the Ören underground settlement in Yeşilöz village on the Avanos-Gülşehir road and its 500 m. mounds seen in the east. It can be said that between the first civilization established in mounds and the last civilization (between 3000-100 BC), underground settlements were built and these were used constantly or in times of danger (Yörükoğlu et al., 1990: 14). Although it is difficult to determine with 100% certainty when the underground cities were excavated, there are many hypotheses about the excavation periods. One of these assumptions is that they may have been

excavated in the Hittite or Phrygian period. The most important reason for this is that all underground settlements in the region are 300-500 m deep. There are frequent rock reliefs and written monuments from the Middle and Late Bronze Age in the vicinity (Gülyaz & Yenipınar, 2003: 47; Ayhan, 2004: 29-30; Yörükoğlu et al., 1990: 9). Again, the frequent occurrence of masterfully constructed underground passages called "potern" in the defense system of Hittite cities strengthens the opinion that there may have been a Hittite influence in the formation or expansion of the underground settlement in the region (Gülyaz & Yenipınar, 2003: 47). Poterns are a typical defense system developed by the Hittites. Considering that there was a Hittite influence in their formation, it is possible that the underground cities were also military structures for defensive purposes.

A hand mill from the Hittite period was found in the lower floors of Derinkuyu underground city. Since this hand mill may have been brought there at a later date, it is not sufficient evidence to be used in archaeological dating, but based on this, it can be said that the underground city was used for several centuries (Emge, 2011: 5). Again, there is a different situation in Derinkuyu Underground City than the examples seen in the Roman-Byzantine periods. While the transition from the first floor to the second floor is provided through a corridor with stone doors, there is no such system on the other floors and the transition to the floors is provided directly (Ateş, 1996: 83-85).

Adıbelli (2002: 174) stated that when the historical layers are followed after the Hittite period, there are traces that underground spaces were used during the Phrygian period as well. He supported this view with a square-planned temple located at the entrance of the Mazıköy underground city and the presence of sacred signs of the goddess Cybele in this temple (Adıbelli, 2002: 174). This information obtained from the literature points to the connections of underground settlements with the pre-Christian period. However, the deficiencies in archaeological and archaeometric data show that this information is not supported by scientific evidence and cannot go beyond a guess.

As a result, there are many opinions that the lifestyle and rock carving practice in the region dates back to the pre-Hittite period and that subsequent cultures continued this settlement process in the region. Metal tools were used in the creation of Underground Cities. Considering the rock settlements and metals found in underground structures, it can be said that the underground cities used since the 3rd millennium BC cannot be dated back any earlier (Ayhan, 2004: 29). Again, the oldest source about underground cities dates back to B.C. Since Xehephon, who lived in the 4th century, has a work called "Anabasis", the underground settlements can be dated to this period most precisely (Gülyaz & Yenipınar, 2003: 49).

Rock tombs from the Roman period in Nevşehir and its surroundings show a distribution parallel to the areas where underground cities are concentrated. The presence of niched klines[1] in the rock tomb chambers in the Underground Cities shows that the people of the Roman period also played a role in the construction of the Underground Cities (Gülyaz & Yenipınar, 2003: 48). There are rock tombs from the Early Roman period on both slopes of the valley where the Mazı underground city is located. In the Tatlarin underground city, there are niches that are thought to have been used as graves in the Roman period and as cellars in the Byzantine period. These niches are similar to the niches in Roman rock tombs.

There is a rock monument written in Hittite Hieroglyphs near Gökçetoprak (Sivasa) Underground City. In addition to this monument, which is thought to belong to the Late Hittite period, there is a Zeus Statue made in relief during the Roman Period. This statue is the only work made in high relief in the Cappadocia Region (Gülyaz & Yenipınar, 2003: 85). In addition

[1] The cedar, usually made of stone, on which the dead were laid in ancient graves.

to the traces of the Roman period being generally traced through rock tombs, the finding of such a statue suggests that the Gökçetoprak underground city and its surroundings may have been used as a religious center.

The most obvious cultural evidence that has survived to this day in the underground cities belongs to the Byzantine period. The region dates back to the 3rd century AD. The Persian attacks started in AD and the first one was in AD. It was the scene of the Arab raids in 642 and the Byzantine-Persian and Byzantine-Arab struggles (Ötüken, 1987: 3). It can be thought that the people who settled in secret valleys and rock holes on the slopes during these turbulent periods may have settled underground, which was safer. The Iconoclasm movement, which spanned the years 726-842, also caused people to prefer underground for protection (Stea & Turan, 1993: 177). The idea that the underground settlements in the region may have been excavated by the local Christian people between the mid-7th century and the early 11th century, which coincided with the Arab raids, is supported by various researchers (Jerphanion, 1925; Kempe, 1988; Ousterhout, 2017). The most important evidence of the Byzantine period around the underground cities are churches. Güzelyurt (Gelveri) underground city is an important example at this point, with churches made of cut stone from the Byzantine Period around it. St. Gregorius Church and Sivişli Church, known today as the Church Mosque, are located in this region.

It is thought that underground cities were used for similar purposes during the Seljuk and Ottoman periods. Although there is no definitive evidence that they were used for shelter and shelter during these periods, it is thought that they may have been used as secret shelters for military purposes and therefore were kept secret (Gülyaz, 1998: 520). In the 14th century, Christian locals used underground cities to protect themselves from Timur's Mongol raids (McIntosh, 2017: 1). Between 1909 and 1911, Cambridge linguist R. M. Dawkins conducted research on the Greek natives in the region and noted the following: “When the news of the latest massacre came in Adana, most of the population in Axo took shelter in these underground rooms and did not dare to sleep above ground for some nights.” (McIntosh, 2017: 1). The information that it was inhabited until the end of the 20th century, with the use of it by the Greeks living in Cappadocia, has been obtained from written sources. The underground settlements were abandoned with the exchange between Turkey and Greece in 1923. Today, some of the underground cities are opened to tourism and can be visited. Some parts of the underground cities, which have not been opened to tourism and have not been largely unearthed, are used for storage etc. It is used for different purposes.

Functions of Underground Cities

When underground cities are examined functionally, it is seen that they do not serve a single purpose, but are arranged to suit all kinds of uses. In addition, it is not known what special conditions and pressures they emerged as a result of, which makes it difficult to reach a definitive conclusion in dating and understanding the reasons for their construction. As a matter of fact, underground cities can be used for permanent residence or are equipped for periodic use and hiding. This situation makes the issue even more complicated. Although they have many units to ensure vital continuity, the majority of them do not have toilet cabins, making underground cities a reserve city that offers the opportunity to settle in temporary and dangerous situations (Ateş, 1996: 81).

Underground cities served as shelters during wars and were even used as “military garrisons” by the local people and the soldiers themselves. N.Thierry determined that these cities were located on the Byzantine military line (Thierry, 1983 cited in Adıbelli, 2002: 175). Emge (2011: 6) associates the fact that the underground cities are very large and can be disconnected from the outside at any time, with the fact that they were designed as “Trojan

Horses" in order to serve military purposes. The fact that the stables are located on the upper floors of the underground cities and the presence of many units inside supports the view that the underground cities may have been used as a part of military strategy. Talking about the war strategy of the Cappadocia Region, Nicephor Phocas reports that special scout units watching the regional roads alerted the people in case of danger and ensured that they took shelter in the underground cities with their goods as soon as possible. Leon Diacrel also stated that the people of Cappadocia could quickly hide in the labyrinths of underground cities when there was a dangerous situation (Adıbelli, 2002: 175).

During the field study conducted in the region, it was obtained that the Tatlarin underground city, which has very regular and high tunnels, was used as a military garrison. The rock-carved places in the surrounding area suggest that the people living here went to the underground city in times of danger. The dungeon section and the presence of holes on the walls to tie slaves prove that this was a military unit where captured enemies were brought. Emge (2011: 6) stated that in the early periods of the Byzantine Empire, many soldiers were stationed in the large plain areas close to the area today called Göreme Valley Ruins. These soldiers, who received small amounts of food and payment, mostly made their living with the supplies they received from the local people. Some of the food provided to contribute to the army at the front was stored in underground warehouses and silos to be used in times of war, natural disaster or famine. This shows that underground cities serve as food storage as well as hiding purposes. According to Kaya (2005: 22), the reason why there are so many underground cities in the region arose from the necessity of looking at these settlements as "fortresses". If there was a rock outcropping (surface) in settlements such as Uçhisar, Ortahisar, Ürgüp or Mardin, castles were built there. In some cases, double employment was provided with both castles and underground shelters. The fact that Kaymaklı Underground City is still called "Eneği Castle" among the public today shows that underground villages/cities are intended for shelter during times of protection. A similar situation exists in Tatlarin Underground City. The abundance of food warehouses and churches in the Tatlarin Underground City, located on the hill called "Castle" in Tatlarin Town, suggests that this place may be a military garrison or monastery complex rather than a normal underground settlement (İpek, 2008: 58). Castles are structures built for defense and security purposes. The fact that underground cities are located in areas seen as "Castle" confirms the idea that they were created as centers of shelter and self-defense in times of danger.

Distribution of Underground Cities in Nevşehir and Its Surroundings

Firstly, underground cities are densely seen around the rocks called "Ürgüp Formation" by Pasquaré (1968). In the region alone, 22 large underground cities located in ignimbrites have been identified in Nevşehir and its surroundings. In recent years, a new underground city located in the Nevşehir settlement area has been added (Ayhan, 2004; Doğan, 2021: 128).

Various opinions have been put forward about the number of underground cities in Nevşehir and its surroundings. According to the list of Cappadocia Underground cities created by the Italian Speleology Association (SSI, 1995), headed by R. Bixio, there are 60 in Nevşehir, 46 in Aksaray, 35 in Niğde, 22 in Kayseri, 5 in Kırşehir, 4 in Yozgat and There are a total of 175 underground cities, 3 of which are located in a place whose exact location has not been determined (specified as Nessuna) (Bixio, 2002: 293-307). Martin Urban gave this number as 41. It is not clearly stated what data was used when determining the number of underground cities and whether they were separated from rock-carved settlements in mountainous regions. 41 underground cities, the size of Derinkuyu and Kaymaklı, have the capacity to accommodate 3 times the total population of the entire Cappadocia region and surrounding settlements. Therefore, it is possible that this number was obtained by adding the mountainous settlements of Zelve, Soğanlı, Selime, Uçhisar, Ortahisar and Göreme (Stea & Turan, 1993: 175). In

addition, Gülyaz and Yenipınar (2003: 38) stated that there are 150-200 underground cities of different sizes in the Cappadocia Region.

Various opinions have been put forward regarding the number of underground cities in Nevşehir and its surroundings. However, it is not clearly stated on what criteria these data were obtained. The depth and width of the underground cities in the region vary. However, they are largely similar in terms of their structural features.

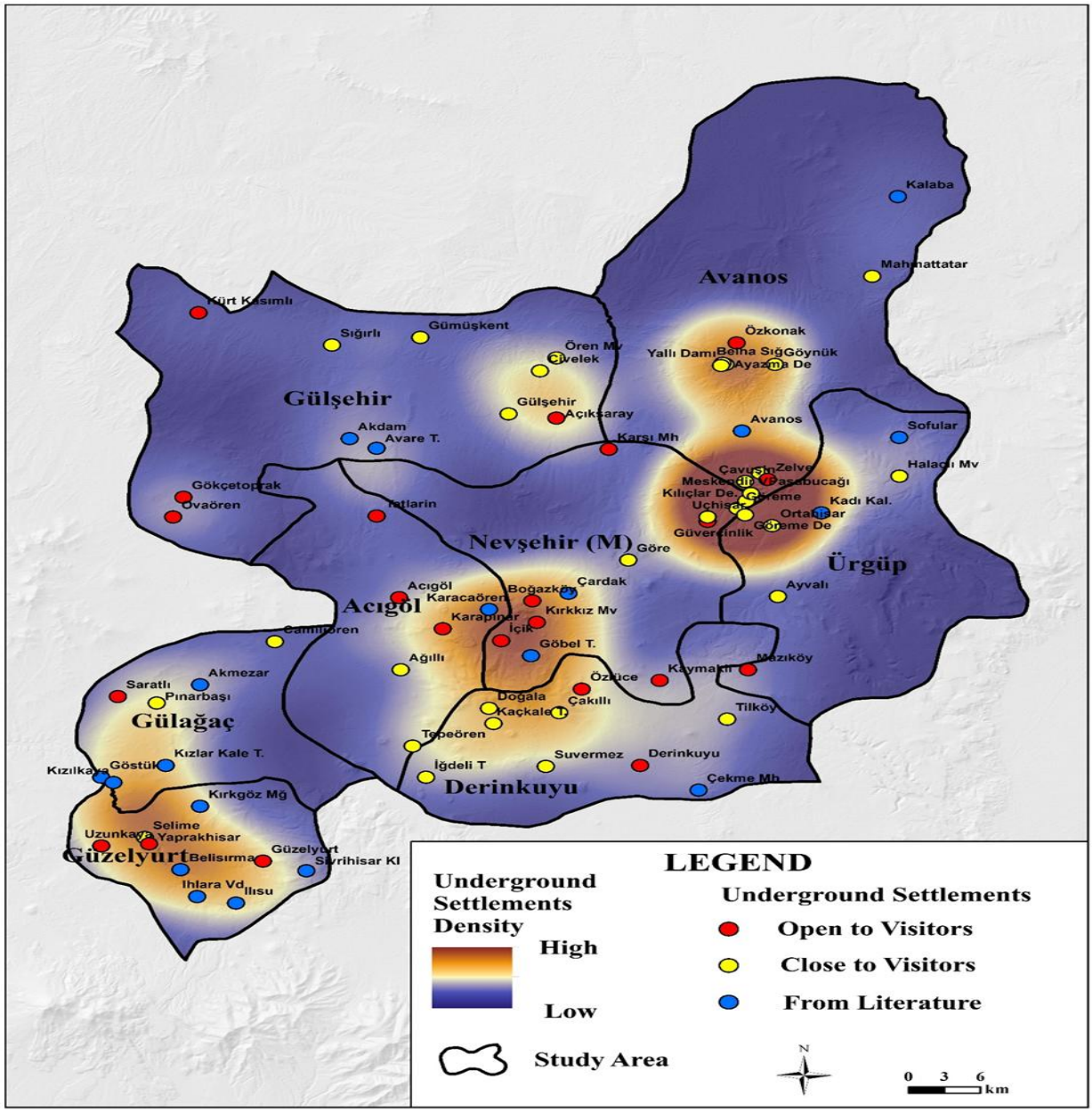


Figure 2: Distribution of underground settlements in the research area and their concentration areas (Edited from Ayhan, 2004).

When Figure 2 is examined, it is seen that the underground cities in the research area are concentrated around the northwest of Ürgüp in Nevşehir, the north of Derinkuyu, and around Gülağaç and Güzelyurt in Aksaray. It is seen that there is a very large underground settlement area in the study area, with underground settlements that are closed to visitors and identified from the literature. Most of these settlements are multi-storey spaces covering large areas. The main underground settlements in the region are given in Table 1.

According to the common view, underground cities are connected to each other with long passages and labyrinth-like tunnels. However, Gülyaz and Yenipınar (2003) stated that there is not enough evidence to support this view. Underground cities are also connected to the houses in the area through secret passages. Corridors were made long, low and narrow in order to restrict movement during enemy attacks (Aydan & Ulusay, 2003: 252). There are hundreds of rooms in underground cities connected to each other by corridors. Derinkuyu, Kaymaklı, Mazı, Özkonak and Tatlarin underground cities are the most important among these underground cities (Doğan, 2021: 128; Aydan & Ulusay, 2003: 252).

Table 1: Distribution of underground cities in the research area by provinces and districts.

UNDERGROUND CITY	PROVINCE	DISTRICT
Kaymaklı Underground City	Nevşehir	Kaymaklı
Derinkuyu Underground City	Nevşehir	Derinkuyu
Til Underground City	Nevşehir	Derinkuyu
Suvermez Underground City	Nevşehir	Derinkuyu
Doğala Underground City	Nevşehir	Derinkuyu
Özlüce Underground City	Nevşehir	Derinkuyu
Özkonak Underground City	Nevşehir	Avanos
Yallı Damı Underground City	Nevşehir	Avanos
Göynük Underground City	Nevşehir	Avanos
Acıgöl Underground City	Nevşehir	Acıgöl
Kurugöl Underground City	Nevşehir	Acıgöl
Tatlarin Underground City	Nevşehir	Acıgöl
Ayvalı Underground City	Nevşehir	Ürgüp
Mazı Underground City	Nevşehir	Ürgüp
Göre Underground City	Nevşehir	Merkez
Boğazköy Underground City	Nevşehir	Merkez
Gökçetoprak (Sivasa) Underground City	Nevşehir	Gülşehir
Ovaören (Göstesin) Underground City	Nevşehir	Gülşehir
Gümüşkent Underground City	Nevşehir	Gülşehir
Abuşağı Underground City	Nevşehir	Gülşehir
Yeşilöz Underground City	Nevşehir	Gülşehir
Gaziemir Underground City	Aksaray	Güzelyurt
Güzelyurt (Gelveri) Underground City	Aksaray	Güzelyurt
Kuluk Ali's House	Aksaray	Güzelyurt
Gözyaşı Underground City	Aksaray	Güzelyurt
Pınarbaşı (Geyral) Underground City	Aksaray	Gülağaç
Saratlı Underground City	Aksaray	Gülağaç
St. Mercurius Underground City	Aksaray	Gülağaç
Göktaş Yeraltı Underground City	Aksaray	Gülağaç
Çukurören Underground City	Aksaray	Gülağaç
Gülpınar Underground City	Aksaray	Gülağaç
Bekarlar Underground City	Aksaray	Gülağaç
Sofular Underground City	Aksaray	Gülağaç

Derinkuyu underground city: Derinkuyu Underground City, excavated into the Kızılkaya ignimbrite, is the best-known underground settlement in the region and opened to touristic visits. This underground city hosted the Proto-Hittites, Romans and Byzantines. Hittite period artifacts and “Eagle at the Peak” statues, the symbol of victory of the Roman conquest, were found in the Derinkuyu underground city. All these are evidence of pre-Christian settlement in the underground city (Ayyıldız, 1990: 96). The depth of Derinkuyu underground

city, which is thought to be the first hiding place of Christians, is 85 meters. The area of the city is 2500 m². Today, 8 floors can be seen. In this underground city, there are churches, kitchens, storage areas, dining halls, wine cellars, toilets, wells, halls, air vents, corridors, etc. there are sections (Doğan, 2021: 128; Aydan & Ulusay, 2003: 252). In addition to these units, there is an interesting underground cemetery and a missionary school with a large vaulted ceiling (Figure 3). There are around 200 rooms in Derinkuyu underground city. It is estimated that there are 400 of these rooms, including those that have not been excavated. A settlement area of this size could not even be seen on the surface at that time. Average 4x4 m. The size of these rooms is not very large and is suitable for a family of approximately 5 people. This indicates that Derinkuyu, significantly larger than similar underground cities, had a living space of approximately 2000 people (Krassmann, 2007: 7).

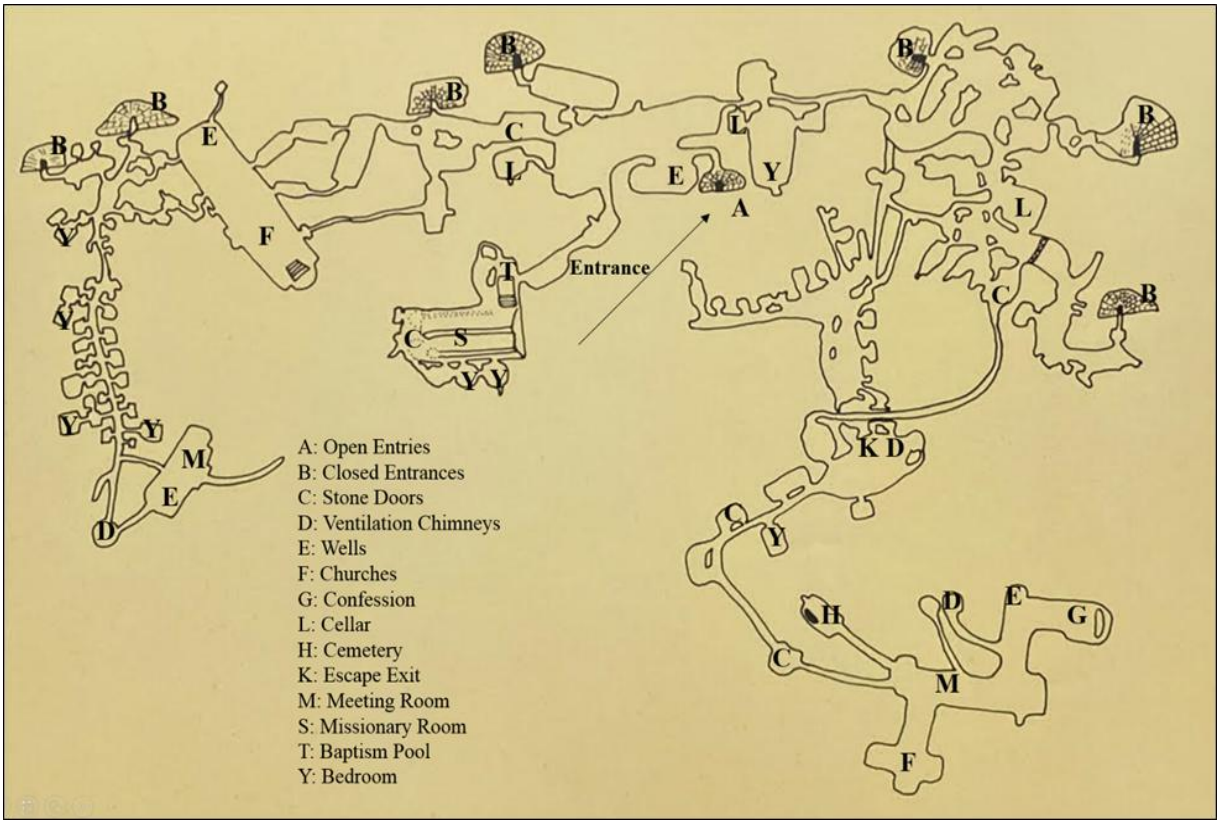
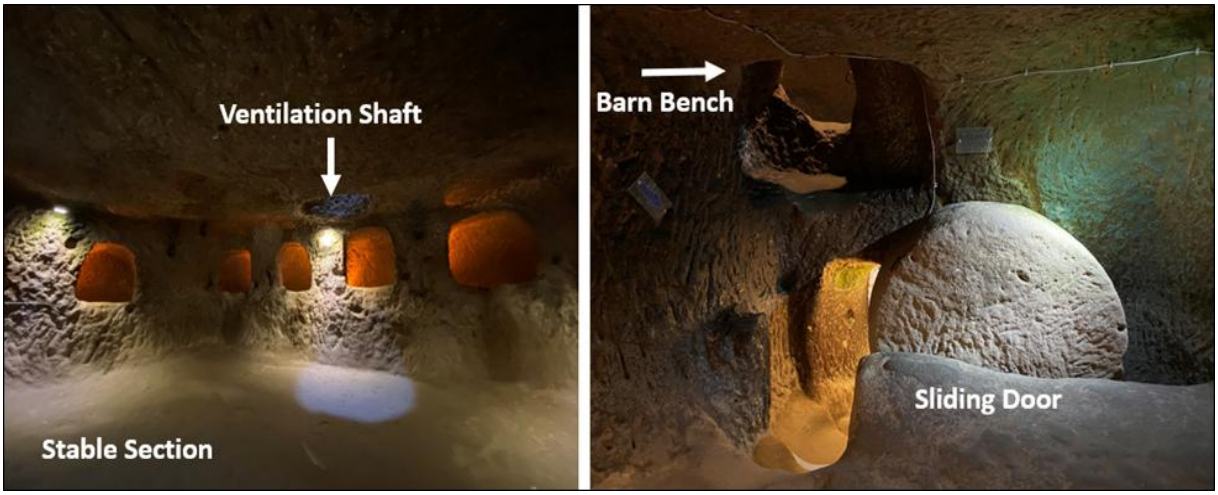


Figure 3: Derinkuyu underground city plan (Edited from Gülyaz and Yenipınar, 1996).

Kaymaklı underground city: Kaymaklı Underground City is approximately 9 km from Derinkuyu (Doğan, 2021: 128). This underground city has the capacity to host 60,000 people (Aydan & Ulusay, 2003: 253). Today, 4 floors of Kaymaklı Underground City are open to visitors. In Kaymaklı underground city, there are halls, rooms, kitchens, water cisterns, warehouses, chapels and ventilation chimneys, connected by tunnel-like passages. The tunnels in Kaymaklı underground city are steeper, lower and significantly narrower than in Derinkuyu.

Özkonak underground city: Özkonak underground city is 14 km away from Avanos district it is located in the north. Communication between floors was provided through long and narrow holes, not chimneys as in Derinkuyu and Kaymaklı underground cities. There are 14 venues of different sizes in Özkonak underground city. At the entrance, there are two large spaces used as stables. It is thought that the irregularly carved niches in living spaces were made for storing items (Aydan & Ulusay, 2003: 253). One of the stable sections is entered through a stone door. It is thought that animals were kept for hiding in this section, where there is also a ventilation shaft. It is also possible that an area at the top may have been used as a section called

"barn bench" by the local people (Photograph 1). It is likely that the barn bench, which is a flat and high room-shaped area created to benefit from the heat emitted by the manure in the barn over time, was used during the winter season. The presence of a stone inside the terrace section shows that it has a feature that opens and closes. It is interesting to think that this section, which is seen as a wooden unit in the local housing types of Anatolia, may have been located in the underground city.



Photograph 1: Özkonak underground city stable section[2]

Gaziemir underground city: Gaziemir underground city is 18 km from Güzelyurt center and 20 km from Ihlara. Approximately 10 km from Gaziemir Underground City. It is entered through a long stone masonry corridor. At the end of this stone corridor, built with the corbelling technique, an example of which is seen in the Hittite capital Hattusa, it leads to an open area that allows access to other parts of the underground complex. Gaziemir underground city was used extensively during the Byzantine period. The most important evidence of this is the discovery of many Byzantine coins during the cleaning work. In addition to various living spaces, food cabinets, animal shelters, tandoor stoves, churches, baths, wine cellars and wine jars were found in the Gaziemir underground city (Arıbaş, 2015: 298).

Gaziemir underground city is also an underground caravanserai. The giant bones found and the animal tethers on the walls suggest that this place may have been used as an inn in later periods. At the same time, some of the corridors connecting the spaces are wide enough for a camel to walk (Arıbaş, 2015: 299). It is thought that the first period of use of the Gaziemir underground city was the Bronze Age. The most intense use was in the Byzantine period, as in all underground settlements in the region. Its location, the units inside, its physical structure and the traces that have survived to the present day support the idea that it was used as a caravanserai during the Turkish period. This underground caravanserai is an important representative of the region's unique settlement character, showing that it has a wide cultural and economic impact.

Saratlı underground city: It is located in Gülağaç. Saratlı underground city, like other underground cities, was built for security purposes and has witnessed many periods of history. It has the ability to accommodate more than one family. In this three-storey underground city, there are 40 rooms used as stables, warehouses, kitchens and living spaces.

[2] All photographs in the study were taken by the author during field studies.

Since Saratlı is located on the King's Road, it witnessed the passage of many saints during the spread of Christianity. It is thought that the most intense use of this underground city was during the Christian period (Arıbaş & Yıldırım, 2012: 206).

St.Mercurius underground city: It is located in Gülağaç district. It stands out as a culturally and archaeologically important place. The underground city is entered from an inn dating back to the Seljuk period, popularly known as “Develik” (Aksaray İl Kültür ve Turizm Müdürlüğü, 2023). The underground city, which contains a church and an Alevi tomb, was carved into the rocky slope extending towards the north in the center of Saratlı village (Yamaç et al., 2014: 37-41).

The church, which is the most important structure of the underground city, is on the 3rd floor and has 20 graves in its basement. This situation is in accordance with the tradition of church tombs in Cappadocia. Most of the graves belong to children. Today, the Alevi tomb, which local people visit and make vows to, is known as "Dedeli Dam Tomb".

Özlüce underground city: Özlüce underground city, which is different from other underground cities in terms of geological structure and architecture, does not have a floor system. However, it is spread over a very wide area. At the entrance of the underground city, there is an interlocking and arched space made of basalt. The long galleries with traps at their bases are noteworthy. There are also food closets, living rooms and cell rooms (Gülyaz & Yenipınar, 2003: 64-65).

Natural structure and human interaction can also be easily monitored through economic activities (Kahya, 2023b). Nevşehir and its surroundings stand out as an important tourism center today. Therefore, the dominant economic activity in the region is tourism. The region is one of the first areas opened to domestic and foreign tourism in Turkey. Its natural and cultural heritage has been effective in this situation. The underground cities in the region are also among the most notable tourist attractions. The most remarkable underground city from a touristic point of view is Derinkuyu Underground City, whose upper floors were cleaned and opened to tourism in 1965. Culture is the source of tourism in Nevşehir and its surroundings. Underground cities are one of the best proofs of the use of space by different cultures in the region.

4. Units in underground cities

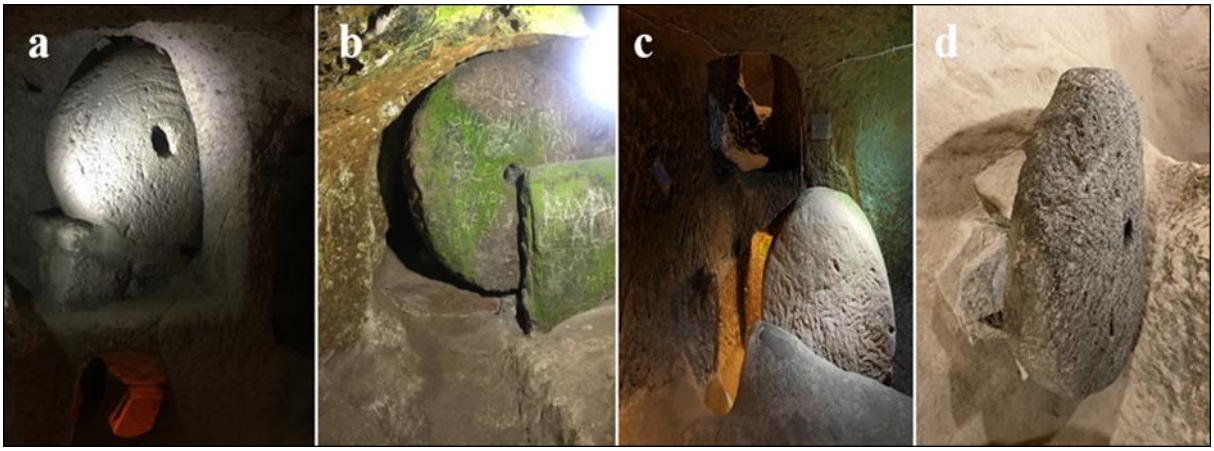
Underground cities in Nevşehir and its surroundings, which attract attention with their locations, functional features and cultural values, stand out with their unique characters. Some common units seen in almost all underground cities in the region were decisive in the formation of this originality. Sliding doors, ventilation shafts and tunnels are the first units that come to mind when talking about an underground city. These units have functions that facilitate the lives of people who use underground cities as shelter and shelter. Some units of symbolic importance for underground cities are as follows:

Sliding doors: Sliding/stone doors located between floors in underground cities separate various areas from each other. These doors, which can only be opened from the inside, are 1-1.5 m wide in diameter and 30-35 cm is thick. (Aydan & Ulusay, 2003: 252). These doors, made of large circular rocks, are located at the entrance of each floor. The doors can only be opened from the inside to prevent the enemy from entering. The doors close by rolling, making it impossible to open them from the outside (Photograph 2).

These stones, which serve as an important defense mechanism in underground cities, are also called “tığraz”. There is a hole in the middle of the cylindrical stone doors. The sliding stone can be opened and closed by moving it in its slot with the help of the support attached to the hole in the middle. Again, this hole allows us to see the dangers that may come from outside and to respond with various defensive tools.

Sliding stone system, 50-60 meters every 10 m in deep tunnels is also repeated. As the tunnels go downwards, the use of bolt stones becomes more frequent (Stea & Turan, 1993: 177). Sliding stones were generally made inside the underground city. However, the situation is different in Özkonak and Gökçetoprak underground cities. The sliding stones of these underground cities were made outside and brought inside. The interior of the Özkonak underground city is light and the sliding stones are dark tuff; 1.5 km from Gökçetoprak underground city. The rock block found far away and left unshaped is seen as obvious evidence of this situation (Gülyaz & Yenipınar, 2003: 77-87).

Another difference about the sliding stones of Özkonak underground city is that there is no hole in the middle of the stones. There is a different application here. It is thought that the hole in the ceiling of the tunnel was opened to pour hot oil on the enemy (Demir, 1995: 84).



Photograph 2: Kaymaklı (a), Derinkuyu (b), Özkonak (c), Tatlarin (d) examples of sliding doors from underground cities

In underground cities, bolt stones with holes in the middle, tunnels with traps at their bases, and holes opened in the ceilings to pour hot oil are the most obvious evidence of the defensive shaping of the space. It is thought that the place called “Dungeon” by the people in the underground city of Tatlarin emerged as a result of the struggles with the enemies. 3 skeletons were found here (Gülyaz & Yenipınar, 2003: 82). The dungeon section was created by carving downwards into the niche on the right wall of a large rectangular-planned space. There are also holes on the walls of this place where slaves were tied (Photograph 3).

Photograph 3: Dungeon in Tatlarin underground city (left) and carved sections where slaves were tied (right)

Chimneys: It is one of the most important additions to underground cities in terms of ventilation and communication. Chimneys, which have been used as water wells as well as cisterns, are generally connected to the bottom floor of underground cities. Cisterns were used to collect, preserve and distribute the water carried to the underground city through channels.

Life in underground cities has been made possible thanks to the chimneys that provide the ventilation system. Especially during the Arab raids, the Arabs' efforts to smoke were unsuccessful thanks to these chimneys, and the people and goods of Cappadocia did not suffer much damage from these attacks (Adıbelli, 2002: 176).

The reason why the units used as water wells in underground cities are disconnected from the ground is the danger of poisoning the water by the enemy. Chimneys can be square or round. There are small niches on the edges of the square chimneys that allow descent and exit (Gülyaz, 1998: 516). The ventilation shaft in Kaymaklı underground city looks like this (Photograph 4).

Photograph 4: Ventilation chimneys, Kaymalı underground city (left) and Tatlarin underground city (right)

Tunnels (corridors): These are long connecting roads built to connect places in underground cities. Tunnels are narrow, flat, curved and long structures. The floors are in the form of ramps or stair steps. Large areas where tunnels meet serve as a central distribution point (Stea & Turan, 1993: 177).

The walls of the tunnels expand upwards in a "V" shape. In this way, walking in narrow corridors is made easier. There are many niches (spaces) opened in the walls of the tunnels to place lighting elements such as oil lamps and candles. Heat and light were provided by burning linseed oil obtained from linseed in oil lamps (Gülyaz, 1998: 516; Ertuğ, 2000: 171-174). Niches opened to place such elements are also found in spaces other than corridors.

5. Daily use areas and worship units in underground cities

The original entrance door has not been found in most of the underground cities. The second of the three entrances of the Acıgöl underground city and the entrance of the Mazı underground city are the original entrances. At the entrance of Acıgöl underground city, a system similar to the house doors in the surrounding area can be seen. The side walls of the entrance are irregular, while the ceiling is made of smooth, thin and long stones (Gülyaz & Yenipınar, 2003: 80). One of the underground cities whose original entrance has been destroyed is the Tatlarin underground city. It can be entered through two rooms located in the west direction. The entrance to the underground city was provided by opening a door to the place, which has niches carved into its walls (Photograph 5).

Photograph 5. Tatlarin underground city entrance

Underground cities have many of the units and applications used in daily life. Among these units and practices, there are also spaces shaped in line with religious beliefs. The underground structures unique to the region are the most well-equipped and safe settlement areas, dating back to ancient times.

Tunnels descending spirally from the entrances of underground cities to the ground floor connect daily use areas such as living rooms and kitchens with religious units such as churches, chapels, baptisteries, wineries and cemeteries. Units with religious functions are generally located after a certain depth. Especially large churches were built deeper, which is thought to be for the purpose of making people feel safer. In Derinkuyu underground city, this distance is 85 m. (Stea & Turan, 1993: 177).

Churches and cemeteries: Underground cities were used intensively, especially during the Christian period, and became centers of religious refuge. For this reason, the church structure is one of the important units. As a matter of fact, there are church structures in many of the rock-carved settlements that are known to have been actively used during the Christian period. There are church structures in the underground cities of Kaymaklı, Derinkuyu and Mazı and they are spread over a very large area. Church units in underground cities can be easily identified based on the traces they contain.

In Kaymaklı underground city, the church section is located on the first floor; At the entrance to the church, there is an altar in the middle and two apse opposite it. There are seating units on the sides (Photograph 6). There is a cross motif on the left wall close to the apse, thought to have been excavated during the Byzantine period (Temizsoy, 2005: 145). Cemeteries are often close to church sections. Their proximity to the church suggests that the people to whom the graves belong may have been religiously prominent people. The most obvious examples of this can be seen in Derinkuyu and Kaymaklı underground cities. In Derinkuyu

underground city, the burial chamber is separated from the church through a narrow, low and long tunnel.

Photograph 6: Kaymaklı underground city, church section

Tatlarin underground city cemetery section is created in a very orderly manner. The similarity of the niches in this section to the niches in Roman rock tombs where the dead were laid is striking (Photograph 7). It is thought that in later periods, its floors were carved and used as food warehouses. The place, which was a cemetery in the Roman period, served as a cellar in the Byzantine period. This example shows that the units are shaped according to the needs and expectations of the cultures that use the space.

Photograph 7: Tatlarin underground city, cemetery section

School: One of the most important units that distinguish Derinkuyu underground city from other underground cities is the Missionary School located on the 2nd floor (Photograph 8). It is known that this large room, which stands out with its barrel-vaulted ceiling, was used as a madrasah. The units on the left side of this room are classrooms.

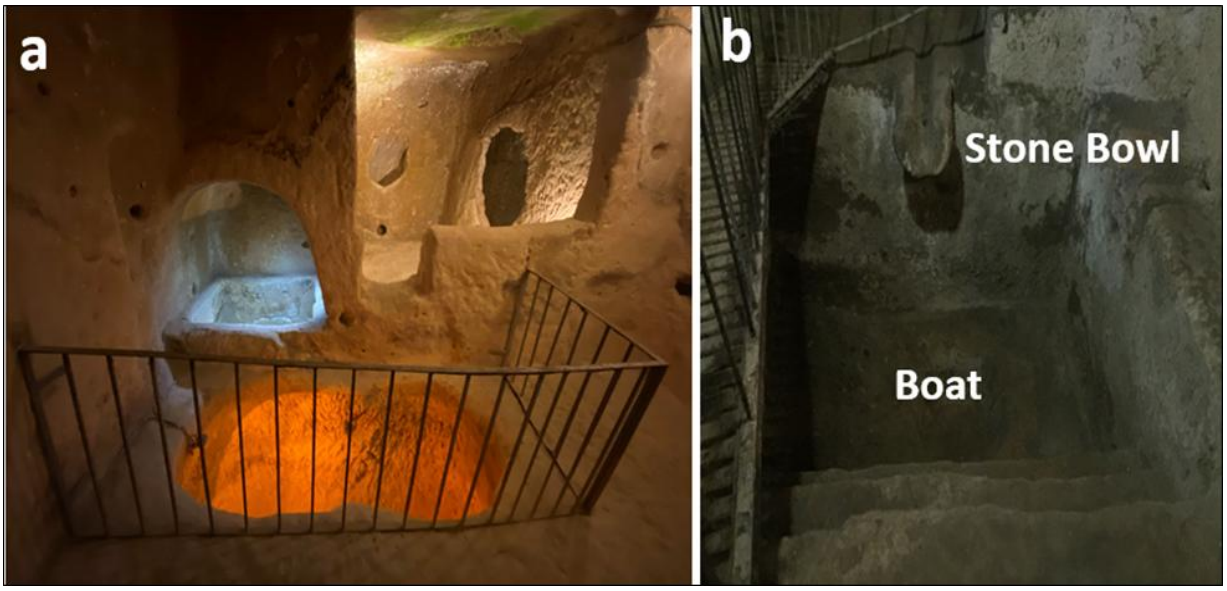
Photograph 8: Derinkuyu underground city, missionaries school

Kitchen: When the kitchen sections in underground cities are evaluated in terms of their numbers, it is concluded that they are a jointly used unit. There is a tandoor (cooking stove) in the middle of the kitchens. The cavities on the edges are for placing food cubes regularly. Kitchens and nearby wineries are generally located on the upper floors of underground cities.

Winery: Nevşehir and its surroundings are one of the most important units of rock carving settlements. This is because they are areas of production and consumption of wine, which is both important in daily life and considered sacred for the Christian religion.

Wineries, which have a workshop function in underground cities, are a special unit and are located close to the kitchen. In wineries, there are rock-cut areas where grapes are collected to be crushed and wells where the must is collected. The must is transformed into wine by going through various processes, then placed in jars to be stored and used (Gülyaz, 1998: 519).

The grape crushing trough and the cone-shaped opening in the middle of this trough are seen in all wineries. The basin below is where the grape juice released during the crushing process is drained through a stone trough (Photograph 9). The resulting grape must is processed through various processes to obtain wine. Wine was stored and used by filling it into cube.



Photograph 9: Özkonak underground city/winery (a), stone bowl and boat where grape must is drained in Derinkuyu underground city winery (b)

Food warehouses (silos): They are located on the floors of kitchens and living rooms. These warehouses expand towards the bottom (Photograph 10).

Photograph 10: Derinkuyu underground city, provision stores

Barn: The oldest floors of underground cities are usually the ground floors. Since it was difficult for animals to reach the lower floors, these floors were generally used as stables. There are irregularly carved cavities at the bottom of the barn walls to place feed and water for the animals and holes to tie them up (Gülyaz & Yenipınar, 2003: 43-44). Stables are spread over a wide area in underground settlements. In the underground city of Mazı, there is a trough carved

from the rock that allows animals to drink water. It distinguishes itself from others with this feature. The large number of barns gives an idea about both people's daily life activities and the abundance of animal production. When evaluated from an economic perspective, this indicates a society with a good level of welfare.

Toilet: It is not a common unit in underground cities. Toilet facilities are only found in the underground cities of Tatlarin and Güzelyurt. In both underground settlements, toilets are located at the end of an L-shaped corridor. It is thought that this may be to prevent odor (Gülyaz, 1998: 516). B.C. It is stated that the rock-built toilet in the Tatlarin Underground City (Photograph 11), thought to have been built by the Hittites living in the Cappadocia Region in 3000 BC, pioneered the spread of toilet culture in Anatolia (İpek, 2008: 58).

Photograph 11: Tatlarin underground city, toilet section

6. Trade and mining in underground cities

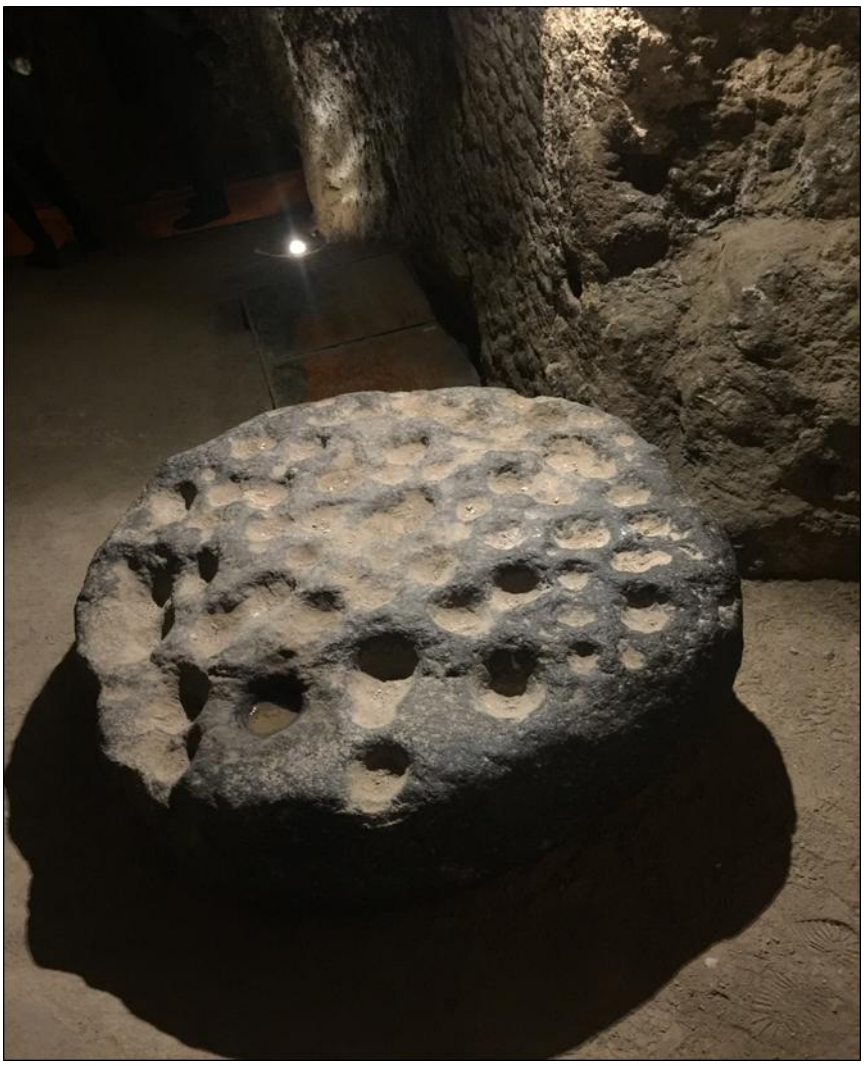
The proximity of underground settlements to trade routes enabled merchants to store their supplies safely and served as their temporary shelter. Gaziemir Underground City, which is known to have been used as a caravanserai, provides concrete evidence of this situation. In addition, the closeness of the underground cities with the Seljuk caravanserais is remarkable.

There are Seljuk caravanserais (A.D. XI.XIII. century) near Acıgöl, Kurugöl, Tilköy, Gümüşkent, Mucur, Derinkuyu, Tomarza, Bürüngüz, Develi and other underground cities or equidistant from several underground cities (Yörükoğlu et al., 1990: 14). There is Til Underground City near Dolayhan Caravanserai, Özkonak Underground City near Saruhan Caravanserai, and Pınarbaşı (Geral) Underground City near Ağzıkarahan Caravanserai. The average distance between caravanserais and underground cities is 5-10 km. It is thought that the reason why the Seljuks built their caravanserais close to the underground cities was for military purposes.

There are many production, processing and storage areas in underground cities. This situation, which can be clearly traced through wineries, copper processing workshops and food storage areas, proves that the people have a stable economy and that they continue their daily work underground (Şen, 2019: 1). There are traces of mining on the stone located in Kaymaklı underground city (Photograph 12).

There are various copper processing practices known since prehistoric times. Andesite stone, which is an important type of volcanic rock formed by lava and located on the third floor of Kaymaklı underground city, was used to break down copper ore. In this application, it is known that 10 cm diameter holes are opened on the andesite stone, and the copper ore is put into these holes and hammered and processed (Şen, 2019: 1). Since there is no copper reserve or enterprise in the Nevşehir region, it is not known exactly where the copper ore crushed in this tool was obtained. It is thought that the source of the copper ore used here is the old operating place located in Düğüz village on the Aksaray-Nevşehir highway and today called Bakırçukuru (Kaptan & Yurttagül, 1995: 68).

Although it is called the "Spice stone" because it is found in the 3rd floor kitchen unit, this multi-pitted tool is an ore enrichment tool used to prepare the ore for metallurgy. This tool is made of volcanic rocks, a heavy material that cannot be carried, and was shaped on site (Kaptan & Yurttagül, 1995: 64).



Photograph 12: Multi-pit ore beneficiation device, Kaymaklı underground city

Another relationship between underground cities and mining is the findings of the research conducted by the University of Chicago, USA, that gold, silver and copper were produced in the region during the Assyrian Trade Colonies period. As a matter of fact, the discovery of underground cities by the public has also been associated with attacks on these precious mines. The fact that the multi-pit ore enrichment tool found in Kaymaklı underground city is a copper sensitization stone also confirms the thesis that mineral production was carried out in the region (Kaya, 2005: 22).

Conclusion

In almost every period of life, humans have taken advantage of the opportunities offered by the natural structure and brought a lot of cultural evidence to the present day. Traces of underground life are evaluated as concrete evidence of the cooperation between nature and humans. Underground cities, which stood out with their functions centered on making life easier at the time they were created, are among this evidence. Underground cities contain many secrets waiting to be solved today. It is generally accepted that the most intensive use of underground cities was the Christian period. However, the connections with pre-Christian times are also striking. The presence of similar features in underground cities to the plans and practices seen in mounds, which are Neolithic settlements, constitutes an example of this situation. The underground passages called “potern” seen in Hittite cities are similar to the practices in underground cities and their closeness to Hittite rock inscriptions are other examples of pre-Christian connections. It is difficult to make a definitive judgment on this issue due to the lack of archaeological and archaeometric data.

When underground cities are examined functionally, it is seen that they are suitable for both permanent and seasonal settlement. This situation causes uncertainty regarding both dating and function. Their geographical location or the units within them show that some underground cities are fully suitable for the “military garrison” nature. For example, it is likely that some underground cities located on the hills called “Castle” were built to be used as shelters in times of danger.

Today, the largest underground cities in terms of depth and width are located in Nevşehir. Many underground cities have been identified in Nevşehir and surrounding provinces, and various opinions have been put forward in different sources regarding their numbers. There is no consensus on the number of underground cities because it is not clearly stated what criteria these views were used to put forward. However, they are largely similar in terms of their structural and functional properties. Sliding doors (stone doors), chimneys and tunnels (corridors) are the most common units in underground cities. Church and cemetery sections are among the most important units of underground cities, as they were used extensively especially during the Christian period. Kitchens, wineries, barns, living rooms and food warehouses (silos), which are the main areas where people carry out their daily life activities, can be seen in almost all underground cities. Derinkuyu underground city is distinguished from others by having a school section. The toilet is not a very common part in underground cities and is only found in Tatlarin and Güzelyurt underground cities.

Traces of underground cities from past to present show that these complex structures were used by more than one culture. The fact that the same units are used with different functions is the most important evidence of this. An example of this is the fact that the cemetery section in Tatlarin underground city was used as a food store by having its floors carved out in later periods. Today, many underground cities that have been discovered and not opened to tourism function as warehouses in accordance with today's conditions. This situation clearly reveals the impact of cultural needs and expectations on shaping the space.

The complex underground settlement, bearing tangible traces of human life, has witnessed hundreds of years of a region's struggle for survival. The most intense use of underground cities is for defense and protection. However, investigations show that the use is not limited to this purpose only. So much so that it is seen that there are production, processing and storage areas in the underground cities, whose settlement history dates back to the Hittite period. Due to the high viticulture activity in the region and the culture of belief, wineries and warehouses, which are evidence of settlements for shelter purposes, are examples of these areas. Even when their use for this purpose ended, underground cities continued to be effective in most respects. The contribution of underground cities to the economic activities in the region can be traced through trade and mining activities in later periods. The Seljuk caravanserais built in areas close to the underground cities and the ore enrichment tool used to refine copper found in the Kaymaklı underground city provide traces of mining in the region are examples of this situation. As a result, underground cities have become an integral part of human life in the region and served as important monuments in the continuity and facilitation of life.

This study aims to analyze the underground cities in Nevşehir and its surroundings, which attract attention with their natural structure, as a cultural place. The main reason for limiting the study area to Nevşehir and its surroundings is that the region is a culturally rich region that has hosted many civilizations throughout history. It can be traced through the cultural evidence that has survived to this day that this region was also an important underground settlement area. It seems that the gap that needs to be filled in the literature about the region is studies that prioritize nature-human interaction and therefore are based on culture. As a matter of fact, there are many studies that focus on geology and tourism, and the issue of culture is superficially touched upon in these studies. It is also seen that cultural geography studies are generally based on traditional houses. It is clear that human activities are quite numerous and diverse in human life. It is important to evaluate the material culture elements produced in line with these activities and inherited to the present day in terms of cultural geography. It is expected that the findings obtained in the study will contribute to future studies because they are evaluated from a different perspective.

Underground cities are not only physical structures, but also representatives of social memory, identity and cultural diversity. The cultural preservation of underground cities is very important. In the conservation policies planned to be implemented, local identity elements should be central and the active participation of the local people in conservation should be ensured. It is a necessity that conservation and tourism policies be addressed with a sustainable approach. Carrying capacity analysis in tourism-related studies can contribute to the sustainable use of underground cities. Virtual tours should be prepared to reduce the negative impact of physical visitors on carrying capacity. These tours can contribute to the digital archiving and preservation of underground cities, ensuring that tourist use continues without damaging the cultural heritage.

It is thought that evaluating underground cities from a cultural geography perspective will bring new perspectives to both academic literature and practical applications. At the same time, it can provide theoretical progress in the discipline of cultural geography in terms of further developing, developing or enriching existing knowledge and theories with new perspectives. The study adopted an interdisciplinary approach that could offer new perspectives on fields such as history, sociology, archaeology and architecture, as well as geography. It is thought that this situation will provide ideas and contributions to future studies in related fields.

Bibliography

Adıbelli, R. (2002). *Kapadokya bölgesi'ndeki hıristiyanlık tarihi*, Yayımlanmamış Yüksek Lisans Tezi, Selçuk Üniversitesi Sosyal Bilimler Enstitüsü, Konya.

Akbulut, G. & Gülüm, K. (2012). Suggested Geopark Site: Cappadocia. *Journal of Balkan Ecology, 15* (4), 415-426.

AKSARAY İL KÜLTÜR TURİZM MÜDÜRLÜĞÜ. (2023). Kapadokya'nın yeraltı şehirleri, (Online) 20 February 2023, https://aksaray.ktb.gov.tr/TR-63663/yeralti-sehirleri.html.

Arı, Y. (2005). 20. yüzyılda Amerikan coğrafyası: genel bir değerlendirme. *20. Yüzyılda Amerikan Coğrafyasının Gelişimi*, Yılmaz Arı (Ed.), s. 3-19, Çizgi Kitabevi, Konya.

Arıbaş, K. & Yıldırım, T. (2012). *Tarihin başladığı yer Gülağaç*, Çizgi Kitabevi Yayınları: 368, Konya.

Arıbaş, K. (2015). *Güzelyurt ilçesi'nin (Aksaray) beşeri ve ekonomik coğrafyası*, Çizgi Kitabevi, Konya.

Ateş, M. (1996). *Kapadokya'nın Başkenti Nevşehir*. S. Mülayim, M. Tuncel, & M. Ateş (Ed.), Nevşehir içinde (ss. 54-113). T.C. Kültür Bakanlığı Yayınları, İstanbul.

Aydan, Ö. & Ulusay, R. (2003). Geotechnical and geoenvironmental characteristics of manmade underground structures in Cappadocia Turkey, *Engineering Geology, 69*, s. 245-272. DOI:10.1016/S0013-7952(02)00285-5

Aydoğan Tatar, E. & Aydın, F. (2023). *Karamürsel ilçesinin (Kocaeli) kültürel coğrafyası*, İksad Yayınevi, Ankara.

Ayhan, A. (2004). *Geological and morphological investigations of the underground cities of Cappadocia using GIS*, Yayımlanmamış Doktora Tezi, ODTÜ, Ankara.

Ayyıldız, U. (1990). *Eşsiz Kapadokya*, Net Turistik Yayınlar A.Ş., 2. Baskı, İstanbul.

Birkeland, I. (2008). Nature and the 'cultural turn' in human geography. *Norsk geogr. Tidsskr.,52*(4), 221-228.

Bixio, R. (1994). Surveys in the underground cities of Cappadocia, *XI. Araştırma Sonuçları Toplantısı*, 24-28 Mayıs, Ankara Üniversitesi Basımevi, Ankara, ss.43-56.

Bixio, R., Caloi, V. & Pascale, A. (2012). Kapadokya bir yeraltı yerleşim bölgesi, *1. Uluslararası Nevşehir Tarih ve Kültür Sempozyumu Bildirileri*, Ankara, ss.5-31.

Ceylan, S. (2021). Nevşehir yeraltı şehirlerinin turizm potansiyeli ve ziyaretçi sayıları üzerine bir değerlendirme, 21. Ulusal-5. Uluslararası Turizm Kongresi "İç Turizm", Tam Metin Bildiri, 324-343.

Demir, Ö. (1995). *Kapadokya medeniyetin beşiği*, Demir Yayınları, Nevşehir.

Doğan, U. (2021). *Kapadokya zamanda yolculuk*, Bilgin Kültür Sanat Yayınları, Ankara.

Duncan, J.S., Nuala, C. J. & Richard H. S. (2004). *Introduction*, (Ed.), James S. Duncan; Nuala C. Johnson and Richard H. Schein, A companion to cultural geography, Blackwell Publishing, Oxford.

Emge, A. (2011). "Var olmayanda" kendini evde hissetmek: Orta Anadolu Kapadokya mağara yerleşimlerini, peribacalarını ve yeraltı şehirlerini anlamak, (Online) 22 February 2023, http://www.andusemge.de/Texte/cappacavesturkce.pdf

Erguvanlı, A.K. & Yüzer, A.E. (1977). Past and present use of underground openings excavated in volcanic tufts at Cappadocia area, *Proceedings on Rock Storage*, Oslo, pp.15-20.

Ertuğ, F. (2000). Linseed oil and oil mills in Central Turkey: Flax/ Linum and Eruca, important oil plants of Anatolia, *Anatolian Studies*, Sayı 50, ss.171-185.

Gibson, C. & Waitt, G. (2020). Cultural geography. *International Encyclopedia of Human Geography,* (2), 99-110.

Gök, Y., & Kayserili, A. (2013).Geleneksel Erzurum evlerinin kültürel coğrafya perspektifinden incelenmesi. *Doğu Coğrafya Dergisi, 18*(30), 175-216.

Gülyaz, M. E. (1998). *Yeraltındaki dünyalar*, Kapadokya, İstanbul.

Gülyaz, M. E. & Yenipınar, H. (2003). *Kapadokya kaya yerleşimleri ve yeraltı şehirleri*, Dünya Kitap Kırtasiye ve Turizm Ticaret, Nevşehir.

Güngördü, F. V. (2023). Doğal mirasın kültürel miras ile buluşması: Volkanizma ve tarihöncesi yerleşim stratejileri ilişkisi açısından Volkanik Kapadokya. *Nevşehir Hacı Bektaş Veli Üniversitesi SBE Dergisi*, İhtisaslaşma Özel Sayısı, 1-17.

Hannam, K. (2015). Cultural geography. *Journal Social Research and Behavoral Sciences, (2),* 409-413.

İpek, S. (2008). Tatlarin kasabası, *Nevşehir Kültür ve Tarih Araştırmaları*, Yıl 3, Sayı 10, Nevşehir, s.58-60.

Jerphanion G. de, (1925). Une nouvelle province de l'art byzantine. Les églises rupestres de Cappadoce, tome premier (première partie) (Bibliothèque Archéologique et Historique, tome V), Librairie Orientaliste Paul Geuthner, Paris.

Kahya, E. (2023a). Kültürel coğrafya bağlamında bir analiz çalışması: Ihlara Vadisi kültürel peyzajı, *Akademik Sosyal Araştırmalar Dergisi*, Yıl: 11, Sayı: 141, s. 202-224.

Kahya, E. (2023b). *Nevşehir ve çevresinin kültürel coğrafyası*. Yayımlanmamış Doktora Tezi, İstanbul Üniversitesi Sosyal Bilimler Enstitüsü, İstanbul.

Karakuzulu, Z. & Atnur, G. (2007). Kültür coğrafyası açısından bir inceleme: Tortum, Çıldır ve Tödürge (Demiryurt) gölleri. *Atatürk Üniversitesi Türkiyat Araştırmaları Enstitüsü Dergisi, 14* (34), 157-167.

Kaptan, E. & Yurttagül, E. (1995). Kaymaklı yeraltı şehri'ndeki cevher zenginleştirme aleti, *XI. Arkeometri Sonuçları Toplantısı,* Ankara, s. 63-73.

Kaya, İ. (2015). Kültürel Dönüş ve Yeni Kültürel Coğrafya, *Coğrafyacılar Derneği Uluslararası Kongresi Bildiriler Kitabı,* 21-23 Mayıs 2015, Gazi Üniversitesi, Ankara, , s. 629-633.

Kaya, M. (2005). Yeraltı Şehirlerimiz, *Nevşehir Kültür ve Tarih Araştırmaları*, Yıl 1, Sayı 4, Nevşehir, s.21-24.

Kayserili, A. & Altaş, N. T. (2010). Horasan ilçesi'ndeki kır meskenlerinin kültürel coğrafya bakış açısıyla incelenmesi. *Doğu Coğrafya Dergisi, 15*(23), 81-101.

Kempe D. (1988). *Living underground*, Herbert Press, London.

Kocalar, A. C. (2018a). Arkeolojik yeraltı yerleşmeleri ve koruma sorunları: Nevşehir yeraltı şehirleri (Derinkuyu, Kaymaklı). *Journal of Awareness (JoA), 3*(3), 25-46.

Kocalar, A. C. (2018b). Tarihi-doğal-arkeolojik-kültürel ve jeolojik mirası koruma-kullanma dengesi: yeraltı şehirleri ve jeoturizm (Avanos). *Kapadokya Yerbilimleri Sempozyumu*. (ed. M. Şener). Niğde Ömer Halisdemir Üniversitesi, 98-103.

Kocalar, A. C. (2020). Latmos geopark (Beşparmak mountains) with Herakleia-Latmos antique harbour city and Bafa lake natural park in Turkey. *Turkish Journal of Engineering, 4*(4), 176-182.

Kocalar, A. C. (2021). Jeoturizmin Türkiye'deki potansiyelinin kırsal kalkınma açısından incelenmesi. *Iğdır Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 6*, 25-36.

Kocaman, S., Kayserili, A. & Kaya, F. (2015). Kültürel coğrafya açısından bir araştırma: tarihi Kağızman evleri. *Doğu Coğrafya Dergisi*, *19* (32), 145-170.

Kostof, S. (1972). *Caves of god: the monastic environment of Byzantine Cappadocia*, Cambridge, Mass.: MIT Press.

Krassmann, T. (2007). Underground cities in Cappadocia / Turkey, (Online) 20 February 2023, http://www.mineral-exploration.de/mepub/kaymakli.pdf

Mclntosh, M.A. (2017). Kaymakli and Derinkuyu: two ancient underground cities in Turkey, (Online) 17 March 2023, https://brewminate.com/kaymakli-and-derinkuyu-two-ancient-underground-cities-in-turkey/.

Ousterhout R. (2017). *Visualizing community: art, material culture, and settlement in Byzantine Cappadocia*, Vol. 46, Harvard University Press, Washington D.C. Ötüken, Y. (1987). *Göreme*, Ankara.

Pasquaré, G. (1968). Geology of the Cenozoic volcanic area of Central Anatolia, *Atti Accad. Naz. Lincei, 9*, pp.53-204.

Sauer, C. O. (1925). The morphology of landscape, *The Cultural Geography Reader*, Oakes, T.S. & Price, P.L. (Ed.) 2008, Routledge, New York, p: 96-104.

Sauer, C. O. (1952). *Agricultural origins and dispersals*, New York.

Schein, R.E. (2004). Cultural Traditions, *A Companion to Cultural Geography*, Duncan J.(Ed.), Blackwell Publishing, U.K., p:11-23.

Stea, D. & Turan, M. (1993). Placemaking: production of built environment in two cultures, Aldershot, Hants, England; Brookfield, Vt., USA: Avebury.

Şen, B. (2019). Kapadokya'nın yeraltı yaşam labirentleri, (Online) 21 Şubat 2023, http://www.raillife.com.tr/kapadokyaninyeralti-yasam-labirentleri/

Temizsoy, İ. (2005). *Kapadokya doğa-tarih-kültür mirası*, Dönmez Offset, Ankara.

Wu, J. (2010). Landscape of culture of landscape: does landscape ecology need culture. *Landscape Ecol, 25*(8),1147-1150.

Yamaç, A., Filikçi, B. & Tok, E. (2014). St. Mercurius underground city of saratli (Aksarayturkey), *OPERA IPOGEA, 2*, s. 37-46.

Yamaç, A., Tok, E. & Filikçi, B. (2015). Underground cities of Kayseri (Turkey), *Hypogea 2015 - Proceedings of International Congress of Speleology in Artificial Cavities - Rome, 11-17 March*. s.285-292.

Yıldırım, A. & Şimşek, H. (2008). *Sosyal bilimlerde nitel araştırma yöntemleri*. (6. Baskı). Seçkin Yayıncılık, Ankara.

Yörükoğlu, Ö., Sevil, T., Taşçı, Z., Türkmen, K.T., & Uysal, V. (1990). *Tarihçesi, tanıtımı, plan ve fotoğrafları ile Kapadokya yeraltı şehirleri*, Aşık Ofset, Ankara.