

# Hypogea 2015

Proceedings of International Congress of Speleology in Artificial Cavities  
Italy, Rome, March 11/17 - 2015



EDITORS

Mario Parise

Carla Galeazzi, Roberto Bixio, Carlo Germani



## UNDERGROUND ANTHROPOGENIC LANDSCAPE IN THE ARMENIAN HIGHLAND: FROM THE LATE STONE AGE TO THE MIDDLE AGES

Samvel Shahinyan <sup>1</sup>, Smbat Davtyan <sup>2</sup>, Gagik Poghosyan <sup>3</sup>

<sup>1</sup>Armenian Speleological Centre, NGO - Rostomi 61 - Yerevan, Armenia - armspeleo@yahoo.com

<sup>2</sup>Armenian Speleological Centre, NGO - Totovents 10/1, Apt 21 - Yerevan, Armenia - srdavtyan@mail.ru

<sup>3</sup>Armenian Speleological Centre, NGO - 16 A. Khachatryan St., Apt 23 - Yerevan, Armenia - gagikp@mail.ru

### Abstract

In the Armenian Highland people have both used and carved out caves in almost all types of rocks, such as tuff, basalt, limestone, and sandstone. The cave culture originated in the early prehistoric times and continues to the present day, although the majority and the most significant of these were created and used from the Bronze Age until Late Medieval period. The caves were used for different purposes: they serve as shelters, places of worship, and sites of economic activity.

**Keywords:** artificial caves, anthropogenic landscape, rock-carved structures, Armenia.

### Riassunto

La popolazione dell'altopiano armeno ha sia usato che scavato quasi tutti i tipi di rocce come il tufo, basalto, calcare e arenaria. La cultura della grotta ha avuto inizio nei primi anni della preistoria e continua fino ai nostri giorni, anche se la maggior parte delle strutture più significative sono state create e utilizzate nel periodo compreso fra l'età del Bronzo e il tardo Medioevo. Le grotte sono state utilizzate per scopi diversi: rifugi, luoghi di culto e siti di attività produttiva.

**Parole chiave:** grotte artificiali, paesaggio antropico, strutture di roccia scolpita, Armenia.

### Stages of Development of Anthropogenic Caves

The continuous use of caves in the Armenian Highlands began from the Würm glacial period, because they provided a more secure environment. The next phase began after the glaciation, when the resources of various ecosystems diversified and multiplied, populations grew and along with maintaining tribal units people began to separate into smaller family units, and to use caves. However, at this time caves used by men were exclusively of natural origin (e.g. karstic, volcanic) and for objective reasons (e.g. efficient technologies, a lack of social need) they could not make any significant changes to the caves.

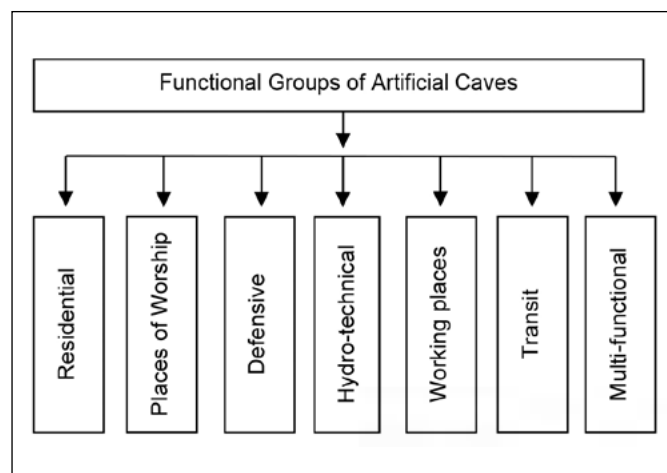
From the Bronze Age (IV to II millennium B.C.), mainly related to certain ritual practices, people began

to actively develop underground spaces, creating a "sacred landscape." Artificial caves became widespread during the Urartian period, when entire religious and burial complexes, hydraulic structures (e.g. reservoirs, canals, and water reservoirs) were carved into stone. Rock-carved structures were so important for Urartu that these structures had their patron deity, Airainin. The culture of rock-carved architecture in the Armenian Highlands declined after the fall of Urartu and no significant underground structures have been discovered until the IV century A.D. Beginning from the IV century A.D., and likely related to the adaption and propagation of Christianity, the culture of rock-carved architecture once again flourished. It is during this period that we see the creation of such cave complexes as the underground Ani, Geghard Monastery, Old Goris, and Old Khndzoresk, etc., which have been preserved until today.

### Functional Groups of Artificial Caves

In the Armenian Highlands artificial (i.e. rock-carved) caves were used for functional purposes from the Bronze Age to the XVIII century A.D. (Table 1). They can be subdivided into: Residential; Places of worship; Defensive; Hydro-technical; Working places; Transit; Multi-functional (Table 1).

Residential caves are places intended for human occupation (Fig. 1), which are composed of habitation and household activity areas. Among these there are also multi-room settlement complexes. In plan, these are rectilinear, with straight ceilings, and iron or other types of roofs are very rare. Inside the walls of many habitation complexes there are rock-carved niches of various sizes. The smaller ones serves as shelves for storing household items, such as dishes,



Tab. 1: categories of artificial caves, according to their functional group.

Tab. 1: categorie di cavità artificiali secondo la funzione.





*Fig. 1: residential caves, Old Goris.*

*Fig. 1: grotte per abitazione, Old Goris.*

the larger and wider ones served as sitting and sleeping benches. These complexes sometimes also contain various economic activity areas, such as barns, cellars, which are located either inside the habitation complex or are separate niches and rooms in the courtyard (KIPSHIDZE A., 1972).

Defensive caves are represented by fortresses, watchtowers, underground secret passages (Fig. 2), etc. Many of the fortresses were built at the top of hills surrounded by deep gorges, making them inaccessible and easily defendable. As early as the V century A.D. Armenian historians have written about secret passages located in these fortresses. These were tunnel-like structures 1.5-2.0 m in height and width, and from few tens to a few hundred meters in length.

Places for worship are represented by churches (Fig. 3), monasteries, shrines/chapels, tombs, cemeteries, etc. Rock-carved churches, both basilicas and central domed ones, were more widespread. The rock-carved tombs, which are present either as open galleries or rectangular halls, are a unique category in this group.



*Fig. 2: St. Astvacacin rock-carved church, 1286 AD, Village of Martiros, Vayoc Dzor.*

*Fig. 2: chiesa rupestre di St. Astvacacin, 1286 d.C., Villaggio di Martiros, Vayoc Dzor.*



*Fig. 3: secret passage of Bjni fortress.*

*Fig. 3: passaggio segreto della Fortezza di Bjni.*

At some locations, one can find shrines adjacent to these tombs.

Underground monasteries, besides church buildings and shrines/chapels, also include buildings of economic activity, such as storage rooms, granaries, cellars, etc (KIPSHIDZE A., 1972).

Hydro-technical structures are represented by canals, qanats (Fig. 4), underground water reservoirs, water mills, etc. Among these most noteworthy are



*Fig. 4: qanat in Yerevan.*

*Fig. 4: qanat a Yerevan.*



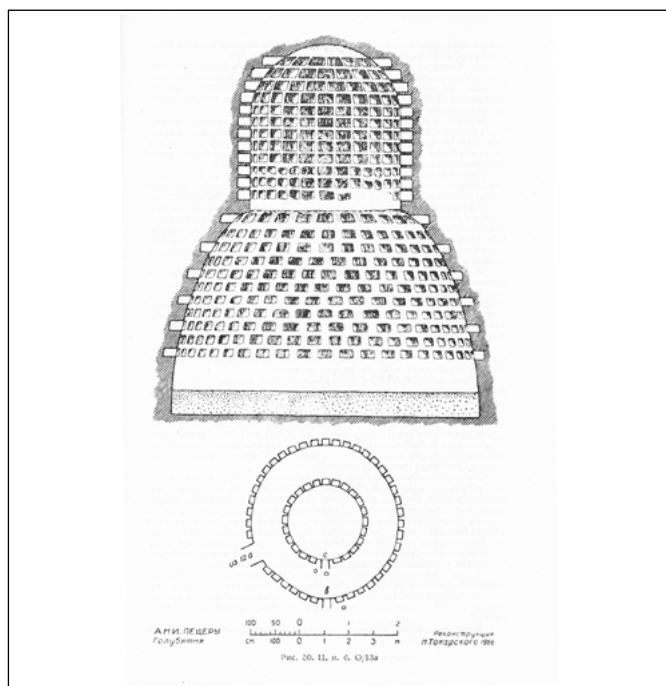


Fig. 5: pigeon loft (drawing after KIPSHIDZE, 1972).

Fig. 5: piccionaia (da KIPSHIDZE, 1972).

underground rock-carved canals built during the Urartian period (VIII century B.C.), which can reach up to 700 m in length and are still partly functioning today. In Armenia, qanats are also widespread, with total length of up to several kilometers.

Working places are represented by quarries, olive presses, potter's workshops, pigeon lofts (Fig. 5), etc. Among these, pigeon lofts (or pigeon pens) are a unique type, which are either rectangular or circular in plan. Small, box-like niches are carved in the walls, which are separated from one another only by a narrow wall. The economic significance of pigeon lofts lies in the fact that pigeon guano was used as fertilizer.

Transit facilities are underground passages, tunnels (Fig. 6), underground streets, etc. Underground streets are particularly interesting structures which either connect habitation caves located on the same tier, or secure connection with the outside world. These have a rectilinear profile and are up to 2 m high (BIXIO R., CALOI V., CASTELLANI V., TRAVERSO M., 2009).

Multi-functional caves are those which within a single complex contain two or more types of caves from the above mentioned categories. Underground Ani (Fig. 7), Old Khndzoresk, Old Goris, Old Voghjaberd, and Old Yelpin are perfect examples of this category, where in addition to residential caves there are also ritual caves (e.g. churches and monasteries), working places, production facilities, etc. Multi-functional caves contain everything necessary for the daily life of the residents.

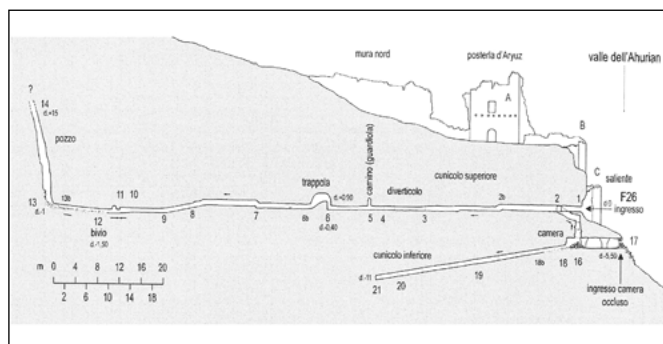


Fig. 6: tunnel in Ani (drawing after BIXIO et al., 2009).

Fig. 6: tunnel di Ani (da BIXIO et al., 2009).



Fig. 7: underground Ani.

Fig. 7: Ani sotterranea.

## Conclusions

In the Armenian Highlands artificial caves started to be used mostly from the Bronze Age and continued through the Late Medieval period. Most of these are carved into volcanic rock, mainly in tuff. Artificial caves are divided into seven categories according to their functional significance: 1) residential, 2) worship, 3) defense, 4) hydro-technical, 5) working places, 6) transit, and 7) multi-functional. Underground residential complexes, which can have from a few tens or even a few hundred artificial caves, are the most elaborate category. Despite the fact that in the Armenian Highland the majority of artificial caves are in ruins, they nevertheless represent a significant part of the Armenian cultural heritage.

## References

- KIPSHIDZE A., 1972, *Pesheri Ani*. Materiali 14-oj Anijskoj arkhelogicheskoy kompanii 1915 goda, Erevan, Izdatelstwo Akademii Nauk Armqnskoj SSR.
- BIXIO R., CALOI V., CASTELLANI V., TRAVERSO M., 2009, *Ani 2004: surveys on the underground settlements*, BAR international Series.