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Rock-cut dovecotes in Cappadocia (Turkey): elements in comparison

Andrea Bixio, Roberto Bixio[1,], Andrea De Pascale[1], Ali Yamaç[2]*

Abstract

Cappadocia, in Central Turkey, is a region particularly rich in structures excavated by man, especially in Byzantine times, but also earlier, then reworked in Seljuk and Ottoman times. One of most evident elements consists of thousands of rock-cut dovecotes, widely distributed in the peculiar tabular rocky outcrops and in the pinnacles formed by soft tuff. According to the sources found until now, they were mainly used for collecting the dung useful for fertilizing the plots cultivated in the valleys. Since the early 20th century, with the advent of chemical fertilizers, the dovecotes have been almost completely abandoned. Some are still intact, identified by small entrances and flight windows of various shapes, overlooking from high rock faces, on purpose smoothed, often whitewashed and decorated. Others were cut by the collapse of the external walls and show overlapping rows of niches for nesting carved in the internal rooms; most of them have arched or quadrangular mouths, rarely triangular, with perches of various type. They were reachable by means of portable ladders and/or footholds carved into the vertical rock faces, not easy to access: for this reason the collection of dung was carried out only once or twice a year, sometimes every two years. A number of dovecotes comes from the modification of pre-existing rock-cut structures, often churches, abandoned with the arrival of the Seljuks in the 11th century, and then of the Ottomans, but also in relatively recent times, at the beginning of the 20th century. In this case, the entrances at ground level, walled with stones, and partially removed and reset only once a year, were much less risky for operators. A peculiar type of dovecote, consisting of underground chambers surmounted by masonry towers, from the top of which the birds entered, has been documented in a single valley near Kayseri, the ancient *Caesarea*, capital of the Roman province of Cappadocia, around the 1st century AD.

Keywords: Cappadocia, artificial cavities, dovecotes, pigeonholes.

The rock-cut settlements of Cappadocia

It is well known that Cappadocia (central Turkey) is a vast area characterized by the pervasive presence of ancient anthropogenic cavities excavated over a long period of time and with a wide variety of types: rock-cut settlements, dwellings, workspaces, shelters, churches, burials, water tunnels, and so on (fig. 1).
Such structures were carved by man, mainly in Byzantine times, within thick volcanic deposits, typically composed of very soft rocks; the landscape consists of extensive undulating plains, surrounded by tabular elevations (mesas and buttes), strongly shaped by meteoric agents, and by collapses, in specific morphologies (canyons, cliffs, and badlands) that, till today, are evolving into their final forms as spectacular pinnacles, locally called *peribacaları* (figs. 2, 3). These morphologies alternate for more than 20,000 square kilometres, at an average altitude between 1000 and 1500 m a.s.l., from which hundreds of monogenic volcanic bodies rise, dominated by the cones of the Erciyes Dağı (3916 m) to the east, and the Hasan Dağı (3268 m) to the west.
To date, hidden in the rocky masses, 364 rock-cut settlements have been located in Cappadocia, of which at least 200 include structures that had the predominant or complementary function of underground shelters. The most articulated of them extend in the subsoil for kilometres and are equipped with simple, but effective multiple defence devices consisting of numerous millstone-doors, vertical and horizontal traps, aiming holes, and more. We point out that only a part of the documented sites corresponds to individual cavities; the majority consists of groups that, in addition to the aforementioned shelters, include dozens, if not hundreds of rooms for residential use and related service facilities, or rock buildings for worship (updated inventory 2022 after Bixio, Yamaç, Galeazzi, Parise, 2021). Suffice it to say that it is estimated that throughout Cappadocia there are remains of more than 1000 rock-cut churches, dating between the 5th and 13th centuries AD (Ousterhout, 2017: 5/13).

The rock-cut dovecotes

One of the elements that most clearly make the landscape of this region unique, in addition to the suggestive natural morphologies mentioned above, are the

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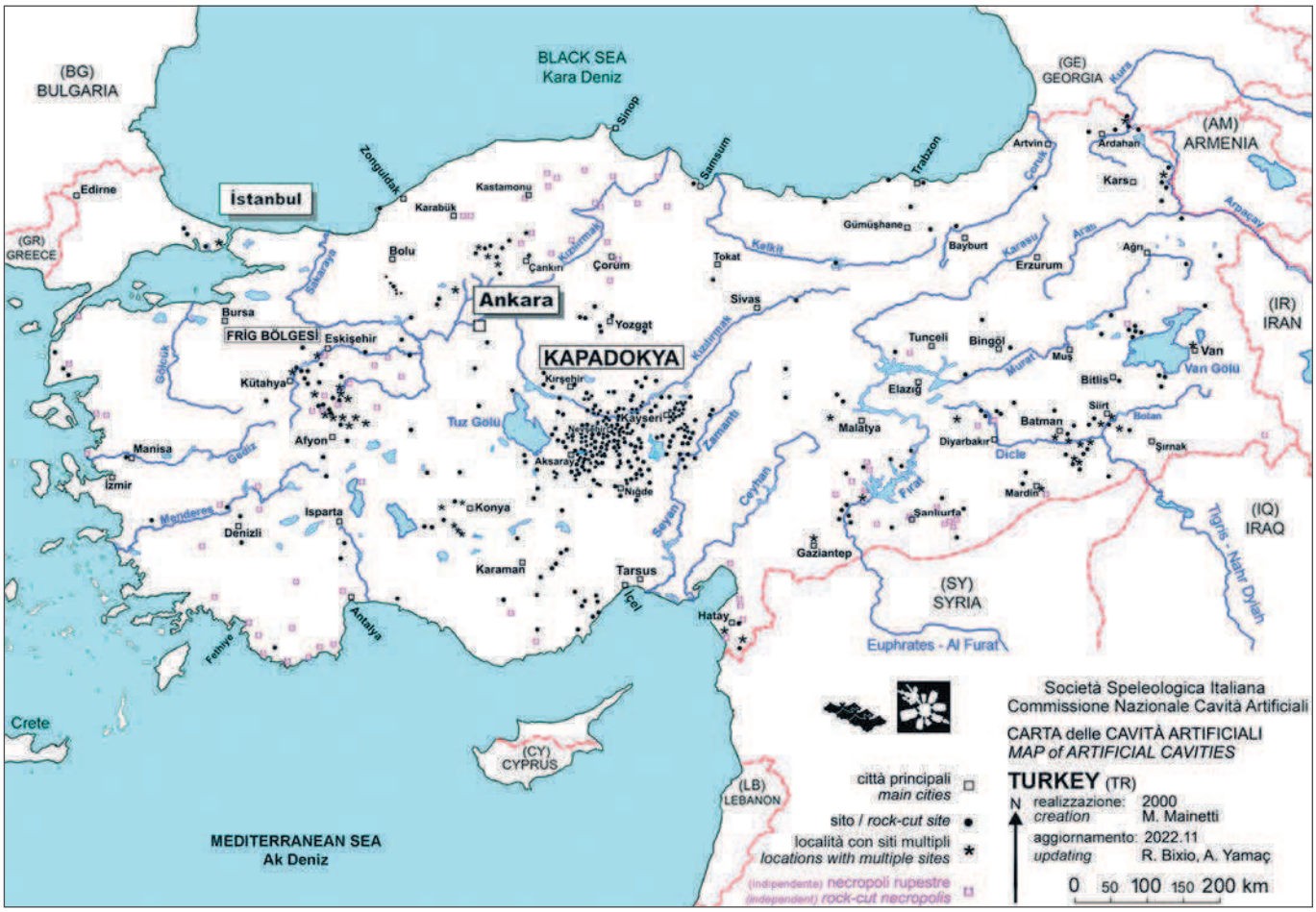

Fig. 1 – Map of the artificial (anthropogenic) cavities of Turkey. In the centre, in correspondence of the historical territory of Cappadocia (*Kapadokya*), between the provinces of Aksaray, Kayseri, Kırşehir, Nevşehir, Niğde and Yozgat, we can note the maximum concentration of underground settlements (map updated 2022 after Bixio, Yamaç, Galeazzi, Parise, 2021).

dovecotes, or pigeon houses (in Turkish, *kuşluk,* or *güvercinlik,* or *güvercin evi/evleri*), carved into the faces of rocky outcrops (*kaya*), visible everywhere.

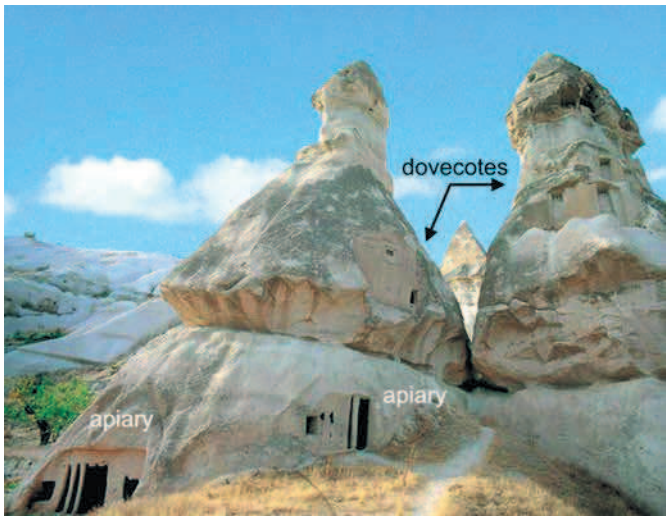

Fig. 2 – Surroundings of Göreme. Dovecotes carved in an elevated position, inside two contiguous tuff pinnacles, combined with two apiaries dug at the base (photo G. Bologna).

These rock-cut structures, along with other less visible cavities (apiaries, grape-treading facilities, kitchens, cisterns, stables...), constituted a logistical apparatus necessary for the rural life of the resident populations, entirely in line with the rocky character of the whole territory. They are associated with rock-cut or surface settlements, but they are spread mostly in the canyons, near the cultivated areas.

In many cases, consisting groups of dovecotes, although now almost completely disused, can be recognized by the countless openings distributed on the faces of pinnacles and cliffs, whose appearance sometimes looks like stone condominiums (fig. 3). However, a large part has now collapsed due to the unstoppable disappearance of huge rock masses, following thermoclastic and erosive phenomena. These collapses produced real sections of the rooms, highlighting their internal structure, characterized by groups of niches for nesting (in Turkish, *niş*), carved into the walls, almost always in horizontal overlapping rows (figs. 4, 5).

The most usual form of such niches is round-arched, stilted shape (or extended arch), or lunette-shaped, rectangular plan and flat-backed wall (Wallace, 1991: xxx-xxxviii) (figs. 5, 8, 11); sometime they are half-dome shaped, with a semicircular plan. Very frequent

are also the quadrangular niches, flat or half-vaulted (figs. 7, 8) and, more rarely, the triangular (figs. 6, 8), ogival, and circular ones (fig. 8). It is not uncommon to find mixed shapes (fig. 4). In other countries, in addition to the above cited forms, there are other types of niches represented in figure 8. They vary in size, but on average are wide and deep between 20 and 25 cm.
To facilitate the stay of doves/pigeons inside the rooms, the niches were often integrated by perches, consisting of linear cornices carved into the rock itself, at ceiling level (fig. 5), or by simple pegs inserted at each nest. In several cases there are still "pole perches": they consist of long horizontal branches that, crossing the room, lean on holes carved into the walls and are supported by a central prop (fig. 7). According to Gülyaz and Yenipınar (1997: 164) some pigeon houses are only equipped with perches. This arrangement would have facilitated the collection of droppings piled on the floor (Amirkhani *et al.*, 2010). Also the quadrangular bowls, later carved into the seats of the perimeter stone benches of some rock-cut churches, are interpreted as pigeon nests (Bobrowskyy, Grek 2016; Catherine Jolivet, personal communication).
The entrances from outside for pigeons are of various types (fig. 9). The birds could pass through some small openings ("flight windows") carved directly into the living rock, or obtained in the ashlars placed to fill larger openings. Their shape generally is arched [a] and [c], or quadrangular [b] [d] [f], or less frequently, circular [e]. The small flight windows are, in turn,

Fig. 3 – Uçhisar. In correspondence to the cultivated areas, near rural or monastic settlements, there are hundreds of rock-cut structures used for the breeding of pigeons (photo R. Bixio).

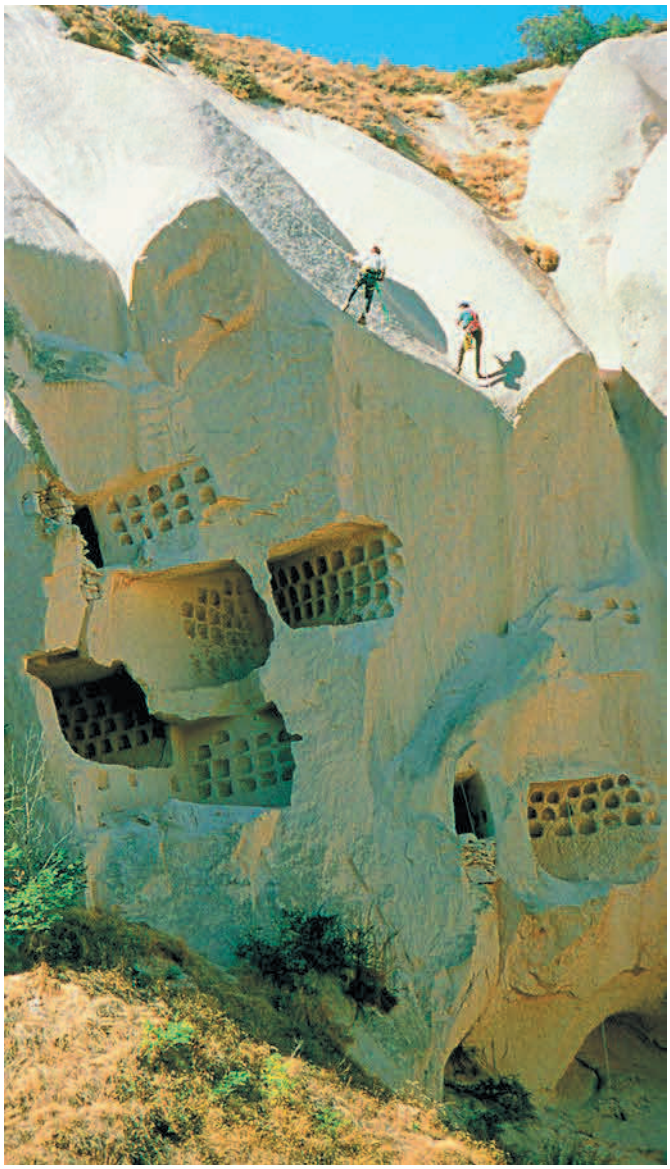

Fig. 4 – Meskendir (Göreme). Cluster of dovecotes cut off by the collapse of the rock face that erased the original entrances, now reachable from above only by rope (photo R. Bixio).

Fig. 5 – Gülşehir. Dovecote near Karşı Kilise (church). Room with arched niches and with the linear perch carved at the top, at the level of the ceiling (photo R. Bixio).

Fig. 6 – Kozanağa Mevkii (Göreme). Dovecote cut by the collapse of the external rocky wall that has put in sight the triangular niches for the nesting (photo A. Bixio).

placed in various ways on the vertical face, intentionally smoothed, of the rocky outcrops: as a rule they are sheltered by cornices or by larger rectangular niches, carved in rock, open and infilled by ashlars, or blind. Sometimes the openings are located on top of the rocks, consisting of short shafts (or chimneys) that descend through the ceiling. Generally, the dovecotes are carved high, into the faces of the pinnacles and the cliffs, starting from a minimum difference in height of about three metres from the ground, with a prevalence of about ten metres, up to even more than double (figs. 3, 4, 10). The rooms were accessible by the owners via a small rectangular opening, about 50x70 cm or slightly larger, that, in some cases, still retains a wooden hatch like that of the rock-cut apiaries. In several cases, a single door enters clusters of dovecotes that, obviously, can be communicating both on horizontal levels and on overlapping planes (fig. 9). As mentioned, most of the doors, placed even at considerable height, at first glance appear completely inaccessible. However, with more careful observation, one can identify various strategies to reach the dovecotes. Sometimes rooms are simply accessible from secluded entrances, carved at the same level, but behind or on one side of a rocky curtain, reached by an easier path, but hidden from view. In other cases, the dovecotes are connected by means of ascending shafts, equipped with footholds (supports for feet and hands carved into the rock) starting from comfortable entrances at ground level or on easily accessible ledges. In several canyons we can see shafts brought to light by the collapse suffered by the rocky face. In many other cases, traces of footholds are detected, often very eroded, carved directly into the external faces of the crags, on staggered vertical rows (see white boxes in figs. 9d, 10); these could reach higher entrances with a very exposed path and not without danger. Consequently, according to the custom attested by the Byzantine hagiography, in a passage of St. Athanasius life (Ger-

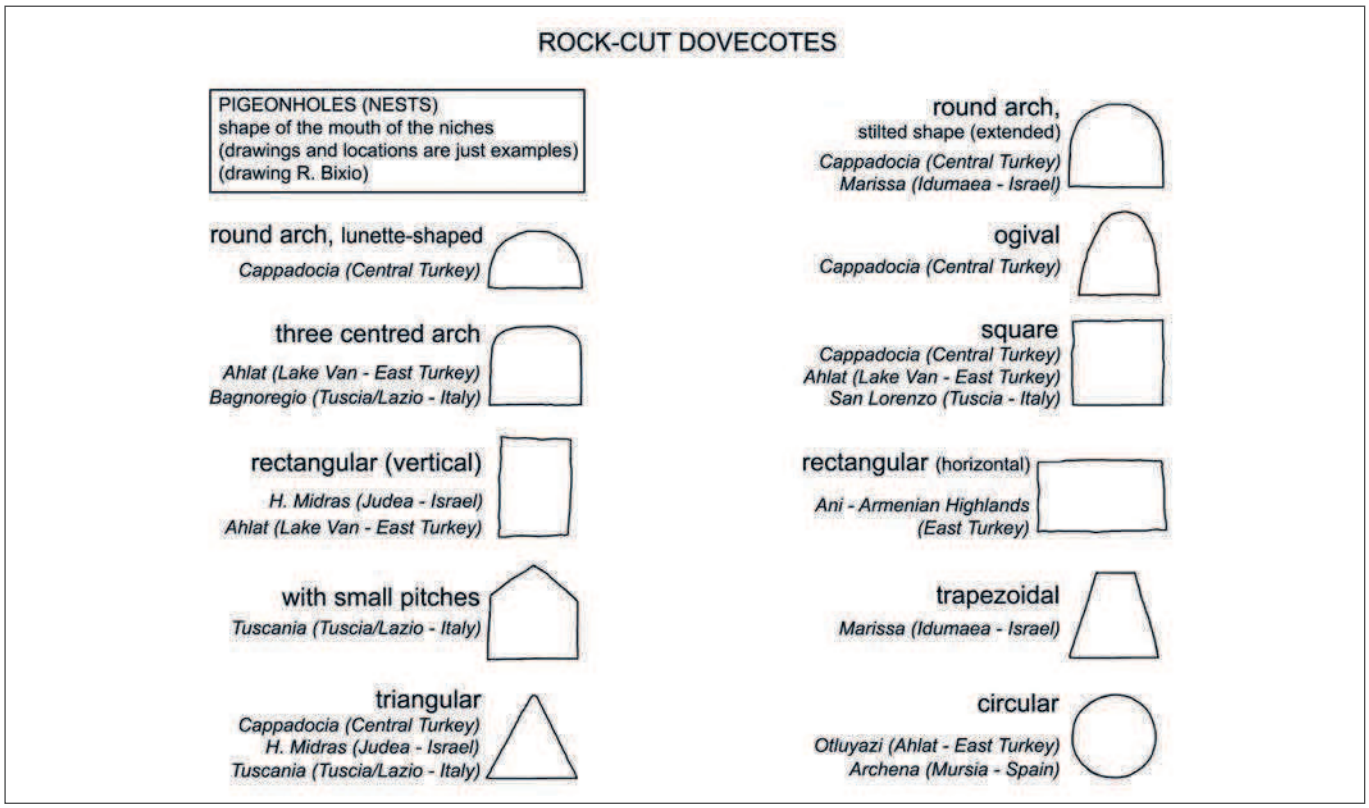

Fig. 8 – Comparative table of niches for the nesting of pigeons, documented in various countries (drawing R. Bixio).

manidou 2015: 34), and later (early 19th century) still witnessed in person by Jerphanion (1925: 16, note 2), the collection of pigeon droppings and, therefore, the ascent was carried out once, or at most twice a year (if not, even, every two years - *infra*); to give credit to the oral tradition, climbing was carried out only by unmarried young people.

The footholds, as a rule, do not start from the base of the rock face, but begin at a height that is difficult to reach without the help of portable ladders that were specifically placed only at the right time, to prevent unwanted intrusions. In figure 10 two types of ladders are rendered, still present in 2012 in the Cappadocian countryside, likely similar to the ancient ones.

Fig. 7 – Kozanaga Mevkii (Göreme). Quadrangular niches integrated by pole perches (photo M. Traverso).

Speaking of climbing modes, we found a vivid testimony of the Jesuit-archaeologist Guillaume de Jerphanion, dating back to his survey of 1912, helped by the owner of a dovecote in the Valley of Swords (*Kılıçlar Vadisi*) near Göreme. *"L'unique porte, soigneusement cadenassée, donnait dans une paroi verticale, à une dizaine de mètres de hauteur. L'escalade en fut des plus malaisées. Quand le propriétaire eut dressé contre la muraille son échelle de perroquet, il lui restait encore environ quatre mètres pour atteindre la porte. Il les gravit avec une agilité surprenant, s'aidant de quelques trous pratiqués dans le tuf* (EdN, the footholds). *Des cordes nous hissèrent jusqu'à lui. Alors, par l'intérieur de la roche, ce fut une longue ascension dans l'obscurité, dans la poussière et dans le guano. Par une cheminée vertical et par une suite de salles basses, de couloirs et d'escaliers tortueux, nous atteignîmes une ancienne église creusée presque au sommet du rocher. [...] Transformée en pigeonnier, l'église a été encombrée de poutres qu'il ne nous fut pas loisible d'enlever* (EdN, the pole perches, see above)" (Jerphanion, 1925: 243-244). In this way the daring French priest-professor, had reached, through underground paths, the *Qouchlouq de Qeledjlar*, i.e., the "Dovecote of Swords", implemented inside an ancient rock-cut church (*Meryem Ana Kilisesi*), overcoming a height difference of about 30 m from the valley floor, although later he

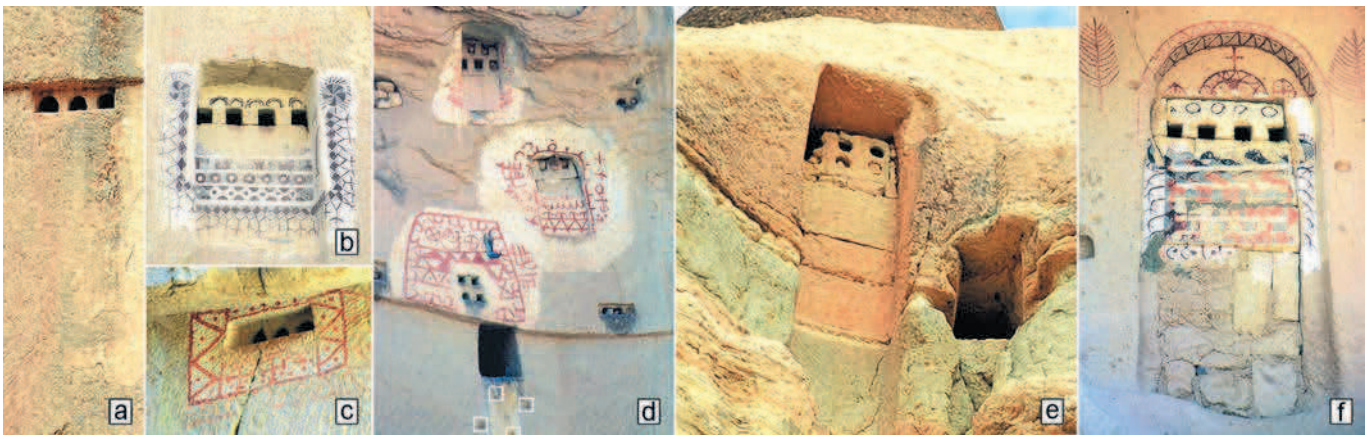

Fig. 9 – Göreme. Comparison of the types of entrances for the people involved in the collection of excrement, and of the small flight windows for the access of the birds of some rock-cut dovecotes (photos A. Bixio and A, De Pascale).

discovered an easier entrance (infilled) on the top of the cliff.

Indeed, it is not uncommon that some of the Byzantine rock-cut churches, abandoned by the Christian people at the arrival of the Seljuks in the 11th century, and then of the Ottomans, have been transformed into dovecotes (fig. 11). This practice has continued until relatively recent times: Jerphanion (1932: VI) testifies that some rock-cut churches he visited in 1912, were no longer accessible during his subsequent stay in 1925 because, in the meantime, they had been transformed into dovecotes. In this case, the entrance at ground level

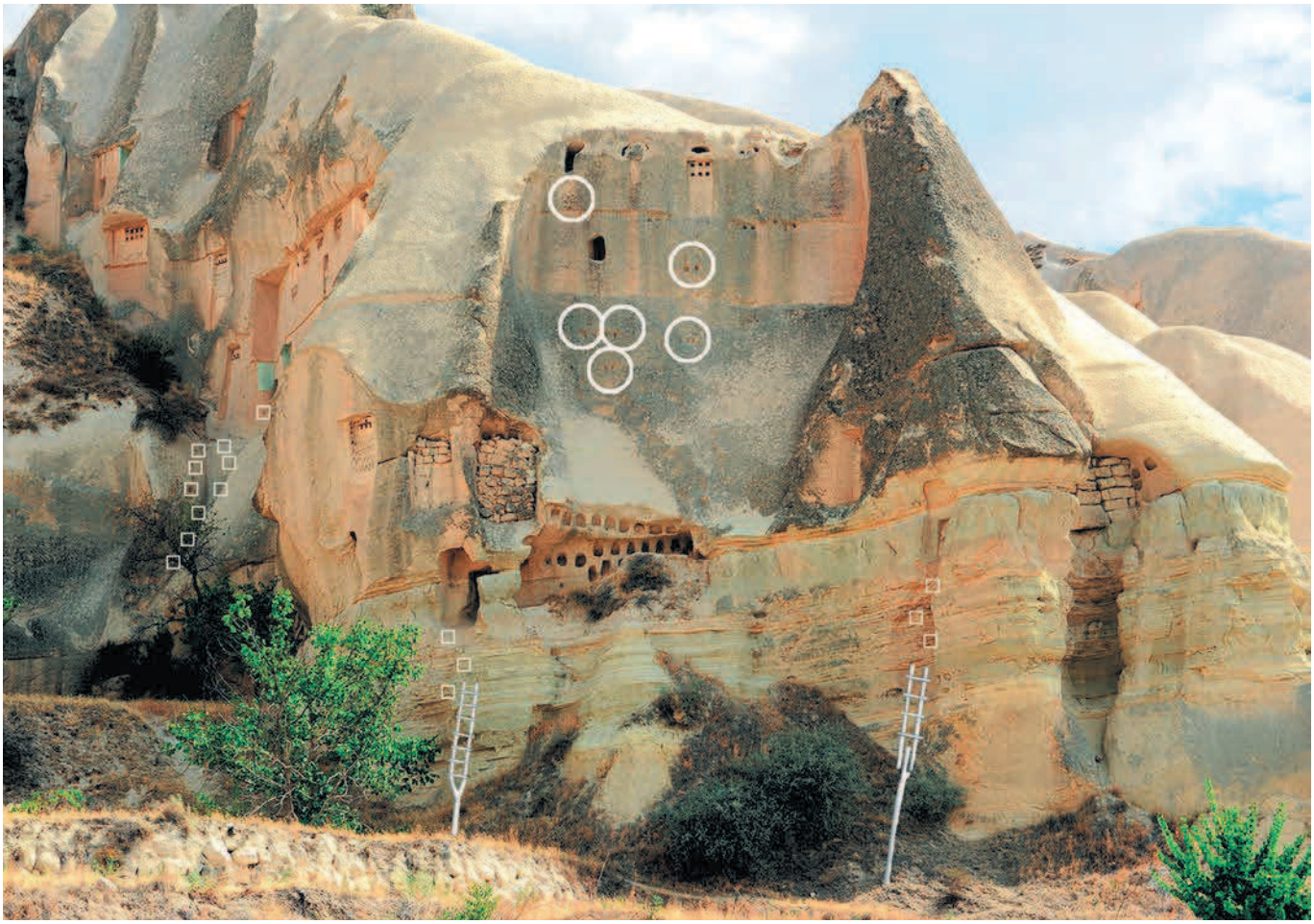

Fig. 10 – Göreme. Fixed and mobile devices detected at the Kozanağa Mevkii site, originally used to reach the dovecote entrances placed high on the vertical walls: ladders (white renderings), footholds (white squares), rock rings (white circles) (photo A. Bixio).

Fig. 11 – Çanlı Kilise (Aksaray). Wreck of a rock-cut church transformed into a dovecote, now abandoned (photo A. Bixio).

could be entirely walled, leaving open at the top only the small flight windows (fig. 9f). Each time the operators entered to collect the droppings (in conditions evidently much less risky than those required to reach the dovecotes placed high up), they dismantled a portion of the wall that closed the entrance and then rebuilt it and did not reopen it until the following year (Gülyaz, Yenipınar, 1997: 166).

At some sites, where there are no footholds, you can notice that on the surface of the walls below

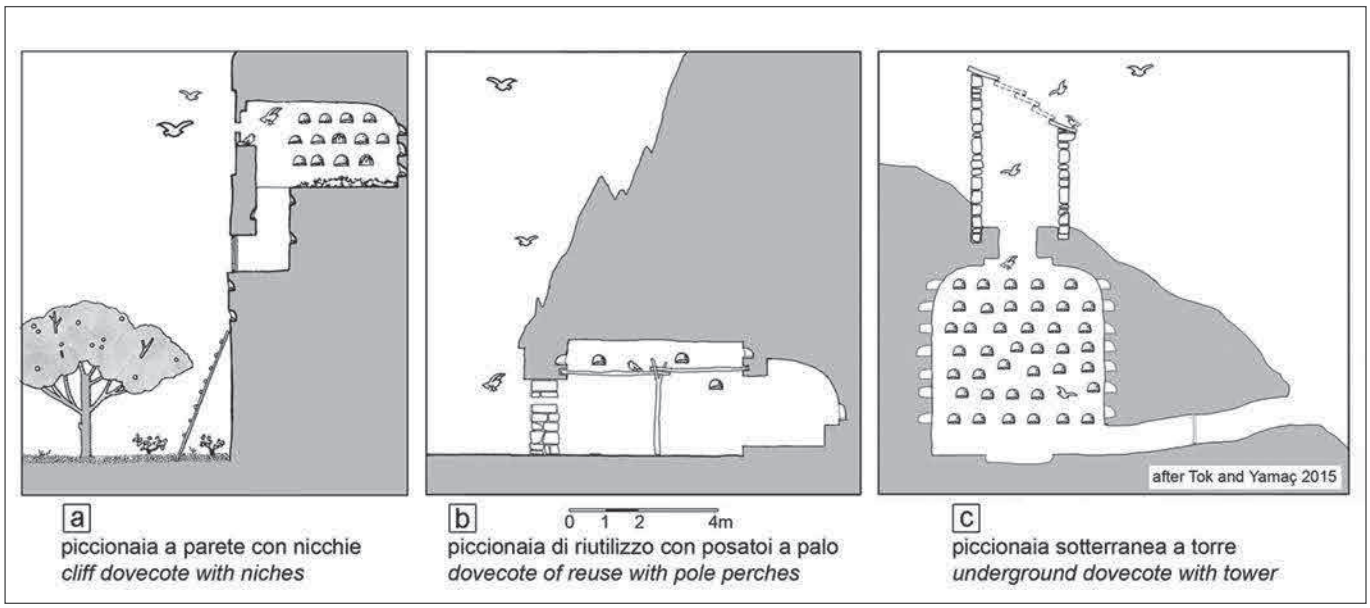

Fig. 12 – Schematic rendering of the three main types of rock-cut and underground dovecotes until now documented in the Cappadocia territory (drawing R. Bixio).

Fig. 13 – Gesi, in the eastern part of the Değirmendere Valley (Kayseri), with numerous masonry towers that rise on the slope, each corresponding to an underground dovecote, as drawn in figure 12 (photo A.E. Keskin).

the dovecotes' entrances, some rock rings have been carved (see, for example, the white circles in fig. 10). Their position suggests the intention to get attachments for lift devices, which otherwise were unstable, like long climbing poles, as we might call the aforementioned *échelle de perroquet*. In addition, we believe plausible that the carved rings were first used to attach the ropes and scaffolding that we imagine were erected not only to begin the excavation of the inner rooms, but also to smooth the high vertical rock faces, carve the blind niches and the small flight windows, and implement the outside decoration.

Purpose of decorations

Indeed, often, but not always, the entrances of the dovecotes are surrounded by painted areas, simply whitened, or decorated with geometric patterns, animals and plants, rarely human figures. According to the sources collected by Murat Gülyaz (Gülyaz, Yenipınar, 1997; Gülyaz,1998), after smoothing the rock, a lime plaster mixed with egg white was supplied on outer walls of the dovecotes, mainly to obtain a slippery surface that did not provide holds to predators such as martens, foxes, weasels, and the like (see also Amirkhani *et al.*, 2010). The same precaution was sometimes obtained with tin or zinc sheets (fig. 3). Perhaps the painted surfaces were also used to attract pigeons which seem to easily recognize the white colour.

The surfaces were then decorated by local artists with traditional patterns, made with mineral colours (such as *yaşa*, an earth rich in iron oxide) and vegetable pigments; green with walnut husk, yellow with raspberries, red with raisins, pink with onion skin, grey with *narpuz* (mint), brown with *kabalak* (tussilago farfara) and alder. Cattle urine was used to brighten colours (Gülyaz,1998).

Generally, the compositions had symbolic value, similar to the patterns of the carpets that originate from the popular Turkish-Ottoman painting of the 18th-20th centuries (fig. 9b/d). However, one can also recognize the Christian symbology, stylistically comparable to those of rock-cut churches (Demenge, 1995: 48), such as crosses (fig. 9c), the tree of life and the writings in Greek, presumably coeval with the dovecotes themselves. In an unidentified dovecote, Murat Gülyaz (1998: 559) points out the presence of the "figure of an Anatolian Greek man [...] demonstrating that the tradition of building and painting dovecotes was not practised exclusively by the Muslim community of the region".

Strategies and types of dovecote

In Cappadocia, essentially, there are three basic types of rock-cut dovecotes (fig. 12).

- a) Cliff dovecotes (or wall dovecotes), originally carved exclusively for breeding birds. As we have seen, they are usually placed high, on vertical rock faces, not easy to access, closed by small wooden doors, and generally hanging. The interior consists of overlapping rows of niches for brooding, carved in the tuff walls. In one of largest dovecotes, in the area of Kızılçukur (Göreme), 548 niches have been counted.
- b) Dovecotes of reuse, obtained in pre-existing rock-cut spaces, originally used for different purposes, generally, but not always, inside rock-cut churches (abandoned). As a rule, the entrances are positioned at the level of the countryside, often completely walled, periodically removable, and without the small

wooden doors. Often, in addition to the niches, they are equipped with horizontal poles with the function of perches.
- c) Tower dovecotes (or "pillar" or "chimney" dovecotes). Then, a third type exists, in part still in use, for now documented in Cappadocia only in the valleys of Koramaz and Değirmendere (Kayseri), where more than 200 were counted (fig. 13). They are composed of two elements. The first consists of one or more interconnected rooms, called "pigeon hall" (*hazne* in Turkish). They have a quadrangular or circular shape, usually of 5x5 m, up to 7 m, carved into the rock under the slope surface: therefore, they are strictly underground. They are accessible by the owners through short tunnels carved at the base, closed by a small wooden door: "this door is located a few steps higher than the main floor of the nest (EdN, i.e., the room with nests) and its threshold is designed in such a way that snakes can not pass through it" (Amirkhani *et al.*, 2010). The typical hatching niches are carved all around the inner walls; they are arranged in several overlapping rows, sometimes supplemented by perches consisting of horizontally crossing wooden poles.
The cavities are surmounted by the second element consisting of small towers *(burç)*, or chimneys, built on the surface with stones. As a rule, they are 2-3 m wide, 3-4 m tall from the slope soil and, inside, 7-8 m from the floor of the pigeon hall. The towers may have quadrangular, circular or apse-shaped plan; they are open on the top (skylights) to allow the pigeons to enter inside, and then in the hall bellow, through one ore more short vertical passages of one metre in diameter, carved into the rock floor on which the base of the tower rests (Tok, Yamaç, 2015). According to Amirkhani (ibid.) "Just underneath this opening, on the floor level of the nest (pigeon hall), there is a bowl hewn into the tufa rock to collect rainwater and snow from which the birds may drink". In our opinion, the peculiar mixed conformation of these structures (carved underground and built on the surface), was induced by morphological needs in a territory consisting of slight slopes, insufficient to develop dovecotes of the wall type. Were there are crags, even of modest height, the two types (wall and tower dovecotes) can coexist. At Maresha (Israel) large dovecotes are documented (dating 3rd-2nd centuries BC), conceptually similar, where, however, the entrance into the underground spaces is allowed by short descending shafts that open at the level of the countryside, instead of towers (Kloner, Zissu, 2013). We point out that, at least in two underground settlements of Cappadocia (Mimar Sinan/Kayseri and Mucur/Kırşehir), there are dovecotes carved below ground level, included in larger structures, with passages for pigeons open in the ceilings, but apparently without towers on the surface. They are not yet well documented and further investigation will be necessary.

Conclusions

The reasons for the implementation of dovecotes carved into the rock, instead of masonry, are the same as for rock-cut dwellings: they were easy to dig, the use of timber for horizontal components of roofs was avoided, they did not occupy agricultural soil. They were dry and, above all, took advantage of the natural thermal inertia that kept the temperature of the cavities comfortable for birds both during seasonal and daily excursions.
In this regard, we consider significant the observations reported by Jerphanion during the exploration of the *Qouchlouq de Qeledjlar*, above mentioned: «*Nous dûmes nous hâter car le propriétaire exigeait que l'on sortît avant le retour des oiseaux, à la chaleur*» (Jerphanion, 1925: p. 244).» «*Le propriétaire n'y entre qu'une fois ou deux l'année pour recueillir le guano. Le reste du temps, on trouble le moins possible les habitants du pigeonnier, de crainte qu'ils ne l'abandonnent. Ces appréhensions nous ont causé parfois des difficultés. Nous ne pouvions travailler dans les* qouchlouq *que le matin, quand les oiseaux étaient dehors. Car ils sortent au lever du soleil pur aller pâturer et rentrent à la chaleur, vers midi. Jusqu'au soir ils restent au pigeonnier dont l'entrée devient impossible*» (Jerphanion, 1925: p. 16, note 2).

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