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At home in "Non-being". Understanding Cappadocia's Cave dwellings, Fairy Chimneys and Underground Cities in Central Anatolia.

Although the traditional image of the "cave-dweller" or troglodyte is a caricature of a hairy Neolithic cave-man, the cave dwellings of Cappadocia were much the opposite: Energy efficient, rather secure and well adapted to the region's challenging climate and its changing social, economic and security environment.

> "Thirty spokes share a hub. The usefulness of the cart lies in the space where there is nothing. Clay is kneaded into a vessel. The usefulness of the vessel lies in the space where there is nothing. A cave-room is created by cutting out doors and windows. The usefulness of the room lies in the space where there is nothing. Therefore the benefit of things sometimes also lies in the usefulness of non-being." (Lao Tse)

The Chinese philosopher Lao Tse, to whom this aphorism is ascribed, lived perhaps 100 years after the prophet Isaiah. In the 8th century before Christ, a portion of the Bible entitled "For the day of the Lord of Hosts shall be brought upon every one that is proud and lofty", Isaiah said: "And they shall go into the holes of the rocks and into the caves of the earth for fear of the LORD and for the glory of his majesty, when he ariseth to shake terribly the earth". (Isaiah 2.19)

This passage in the Bible speaks to where a practical appreciation of the cave-room in which people are said to retreat for protection from trouble of divine, natural or human origin. Many examples of man-made caves from various eras can be found in the Near East. In earlier times they were also widespread in Mediterranean countries.[1] Cave dwellings and graves were excavated in south-western Anatolia, in what was then Lycia, some areas of the ancient Phrygian Kindgdom (*Pepouza* close to the Turkish town Uşak), as well as in the hot, arid regions of south-eastern Turkey (like in *Hasan Keyif*). In *Petra,* in Jordan, entire cave cities and temples were discovered. It seems that wherever the geological preconditions were suitable for their construction, cave homes were hewn out of rock and were converted into comfortable housing.

There are traces of the first Neolithic settlements in many areas in Cappadocia. Examples include some of the excavation of compact villages at *Aşıklı Höyük*[2] and *Çatal Höyük*[3] at the outskirts of Cappadocia and to the southeast of Konya. Although Cappadocia saw the beginnings of first settled culture, no cave dwellings were built at that time. Until around ten

[1] Jessen, Otto. 1930. Höhlenwohnungen in den Mittelmeerländern. In: Petermanns Mitteilungen, Heft 1, S. 128 ff. Justus Perthes, Gotha
[2] http://www.asiklihoyuk.org/
[3] http://www.catalhoyuk.com/

thousand years ago people in Cappadocia lived a frugal life as hunters and gatherers. During the "Neolithic Revolution"[4] human mankind invented agriculture (mainly wheat and barley) and the domestication of animals out of which the first specialised handcrafts developed. The archaeological finds at *Göbekli Tepe*[5] in the southeast of Turkey close to Urfa reveal the first evidence of a place of worship, dating from over 12,000 years ago, illustrating the extremely highly-developed spiritual, social and mythological abilities of the early Neolithic cultures.

The first dwellings in Cappadocia were mud brick so called "agglutinated" buildings, which were built close together, shoulder-to-shoulder. They could often only be entered by a ladder through a hatch in the roof, making them easy to defend. Their inhabitants made scalpels, or sharp tools from volcanic obsidian glass that were traded as far away as Mesopotamia in the "Fertile Crecent" river plain between the Euphrates and Tigris rivers. Despite good irrigation and fertile soils close to the riverbeds, the people of the Cresent lacked suitable harvesting tools, instead an intense trade developed early between these two cultures. This trade flowed in both directions and there is no doubt that cultural and economic knowledge was also transmitted along with obsidian tools and domesticated plant-seeds and animals. This was the beginning of continuous settlement in Cappadocia.

Volcanic activity

Cappadocia is a special geological zone in Central Anatolia. Under pressure from the African and Eurasian plates, the Anatolia highlands grew slowly up out of the lowlands, creating the Taurus Mountains, which range from western to eastern Anatolia. In the later Neogene period (Pliocene 5,332-2,588 million years ago) and within the later periods, some larger volcanoes erupted around Cappadocia's central area, which sometimes remained active into historical times.

A wall painting, more than 8,000 year-old, depicts an erupting volcano in "*Çatal Höyük*", on the western edge of Cappadocia. It is clearly recognisable as "Hasan Dağı", which is near the modern city of Aksaray. Over millennia, large quantities of volcanic ash were cast out of various bigger and smaller volcanoes. The most important are *Erciyes Dağı* (3916 m) and *Hasan Dağı* (3286 m), which are located within a 100 km radius around the plains of central Cappadocia. Depending on the eruptions, the volcanic ash had a different lithic composition, density and colour. The once loose ash condensed over time into solid, but easy to work tuff. Over the centuries, erosion caused by wind, water and frost created the often, bizarre-looking landscape[6]. Most of Central Anatolia's volcanoes are now

[4] Childe, V. Gordon. 1936. *Man Makes Himself. Watts and Co., London*

[5] Current excavations are directed by German archaeologist Klaus Schmidt in southeastern Turkey near Urfa.
See also http://en.wikipedia.org/wiki/Göbekli_Tepe

[6] Bartsch, Gerhart. 1935. Die Tuffkegelbildung in der Ausräumungslandschaft von Ürgüp in Mittelanatolien. Jahrbuch der geographischen Gesellschaft. Hannover

extinct or have been inactive for many centuries, although the various hot springs in the region indicate a high level of thermal energy close to the earth's surface.

This area's enduringly fertile volcanic soil makes it ideal for agriculture. The porous, often pumice-like tufa can store large amounts of water and is rich in minerals. Fruit growing, wine production and small-scale horticulture have become characteristic of the regional economy, ensuring a modest basic livelihood to its local inhabitants.

The beginnings of underground life in Cappadocia

It is not known when people first realised that they might live comfortably in the easily worked tufa. The first underground dwellings in Cappadocia may have been established by the 8th century B.C., when the last Hittites near Gölü Dağı and in *Tyana* (Kemerhisar) were fighting for survival in the area. Well-planned underground residential and defensive complexes appear to date from this time. The ancient Hittite roads ran diagonally across Cappadocia in a north-easterly direction, from *Hatussa* to *Tyana*, evidence of these roads can be found today be found on some mysterious stone inscriptions (e.g. those from *Topada* near the modern city of Nevşehir). Since many people already lived in the region, it is thought, that the first cave dwellings were probably also created at that time. It made sense to carve housing directly out of local tuff, as neither large amounts of timber nor other building supplies such as clay or hard stone are available.

Cave dwellings in Cappadocia were quite easy to build. Tufa was traditionally worked using short pickaxes, sledgehammers and chisels.[7] Once the dry hardened outer centimetres of volcanic rock is broken through, the tufa beneath becomes softer and easier to work. Using traditional methods, two experienced workers could create a 3x6x2m space in 20 days. Given the fact that just a few iron tools were required, the work was comparatively less strenuous than what would have been required to build a "normal" stone-on-stone building, for which large quantities of material would have to be acquired, prepared, transported and processed.

A further advantage of a Cappadocian cave home is that in building a cave dwelling you don't need to worry so much about structural problems, such as supporting structures or planning a roof. Builders are relatively free to design all kinds of internal arrangements.[8]

[7] Öztürk, Fatma Gül. 2009. Rock Carving in Cappadocia from Past to Present. Arkeoloji Sanat Yayinlari, Istanbul.

[8] Today we can observe (or better hear) the wide use of jackhammers (*hilti*), to which the old inhabitants mentioned, that these would be harmful to the rock. In deed, many hair-cracks in new build cave rooms often result from the intensive misuse caused by its sonorous hammering frequency.

Underground Cities

In the 8th century Cappadocia formed the eastern border between the Phrygian Kingdom and the Assyrians, who at that time were at the height of their power under King Midas. German historian Martin Urban conjectures that work to extend these huge underground complexes[9], (the "underground cities" that are now a major destination for visitors to Cappadocia) began at this time. [10]

These underground strongholds often were designed to hold several hundred people, branching off along several levels. All the entries could be perfectly closed off with circular millstone like doors, which were rolled across the tunnels like gates in times of danger. An intruder would never have guessed that multi-storey underground complexes could be hidden behind a small cave entrance that was so easy to conceal and close.

Many of Cappadocia's underground complexes were equipped with various escapes, side tunnels and ventilation systems, which guaranteed fresh air, even in the deepest and most remote corners of the sometimes 80 metre-deep caves. There were also hidden wells, which reached down to aquifers, and were unidentifiable from above as protection from being poisoned. These extensively ramified underground strongholds were therefore practically impregnable.

The underground structures vary considerably and have been identified as storehouses, with silos or storage towers, sunk into the floor; there also were kitchens, assembly rooms, bedrooms, stables, winepresses, schools and prayer rooms. These would have required very precise planning and organisation not only in building the complex, but also in operating it. We can still see today a system of communication pipes that can carry the human voice across the various levels and storeys. Did humanity first use a "telephone" system over here fifteen hundred years ago? In Europe it wasn't until 1865 that Innoncenzo Manzetti succeeded in transmitting a human voice across long distances[11].

These extensive cave systems were lit with oil lamps (which provided relatively feeble light) in the Cappadocian underground. Small fires were also made near ventilation shafts. The toilets were at the bottom of the ventilation shafts and the containers used for this purpose were probably emptied on the surface. The ventilation system (which of course worked without any mechanical ventilators) operated with the flow of air caused by the natural movement of cooler falling, and warmer rising air. These systems are still working so perfectly today, that even several hundred busloads of tourists who come here every day do not leave any smelly or stale air behind them.

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[9] Martin Urban. 1973. Das Rätsel der unterirdischen Städte Südostanatoliens. In: Vorland; Zeitschrift für Europäische Vorgeschichte. Nr. 6-8, Pinneberg

[10] Gülyaz, M.E. & Yenipinar, H. 1995. Underground Cities of Cappadocia.
See also Krassmann, Thomas. 2007. Unterirdische Städte in Kappadokien. Mythos und Wirklichkeit. Online publication. www.mineral-exploration.com

[11] http://en.wikipedia.org/wiki/Innocenzo_Manzetti

The term "underground city" for this kind of complex is in fact misleading, causing us to imagine the people of those times living everyday lives in these subterranean complexes. It is however clear that even in early times, people would not have wanted to live voluntarily and continuously in these complexes, which were always dark and rather cool (14°-16°C). It can be assumed therefore, that these underground strongholds were used as a retreat and as a defence system from enemies, besides also functioning as warehouses.

To date, there have been no major archaeological finds in these underground complexes, apart from the report of a Hittite hand-mill found in one of the deeper storeys of the underground city of Derinkuyu (further indicating their temporary use). These types of hand mills are still used today in the same form, so citing this, as proof of chronological dating is inadequate, since it may as well have also been brought in later. But we can therefore say, that the cave complexes were without doubt used over several centuries and constantly changed and expanded to meet the demands of different groups of people.

"Trojan horses"?

It is interesting to note that the subterranean cave complexes under the plains of Kaymaklı and Derinkuyu[12] tended to be much larger than the normally inhabited villages above ground. During the early Byzantine Empire, in the frontier provinces of Cappadocia, large troops were stationed for decades upon the plains to the south of the region, neighbouring to what is now known as the "*Göreme-Cappadocia National Park*". Soldiers usually received modest pay in the form of food, and troops that time often relied upon supplements from the local population. The communities of monks in the valleys around Göreme would have contributed food for the army "at the front", some of which would then have been stored in the underground depots and silos, as emergency reserves in times of war, devastation, natural disaster or famine. Many of these storage places can still be seen today.

But why were these underground complexes so extensive? And why could they be hermetically sealed? And for what purpose were they were they strategically so ingenious? Perhaps the explanation for these complex underground cities can be seen as "Trojan horses", designed to serve military purposes. Their use as part of military strategy provides an explanation as to why there were so many stables in the upper levels of the caves and clarifies how their many internal facilities would have been used as a hideout for Byzantine troops.

It is thought that invaders were allowed to ride past the "underground

[12] These are two of Cappadocia's best presented and well-lit "underground cities", about 20 km from the Göreme tourist centre. See also the booklet by Yörükoğlu, Ö; Tasci, Z; Sevil,T; Türkmen, K. 1989. Underground Cities in Cappadocia. History of Untergrund Cities with Photos + Plans. Ankara.

cities", which were strung out across the plain like beads. Byzantine troops would then emerge, attacking on two fronts: One approaching in front and one from behind. These military tactics were already known during the early Bronze Age, and would certainly have been familiar to Byzantine military commanders.

Underground cities have been the source of endless speculation. Swiss Erich von Daeniken also had some extra-terrestrial ideas about their origin.[13] Until a few years ago there was even a small UFO Museum in Göreme featuring all kinds of Turkish newspaper articles on the topic. It's also easy to imagine a "Dr. No", pulling the strings of world, being hunted by James Bond through a modernised underground complex of this kind. Cappadocia is undoubtedly a region for lively imaginations!

What is quite clear is that these caves must have been used in various ways during Cappadocia's settlement history. Cappadocia served for millennia as a bridge or bridgehead for various major cultures between Asia and Europe. Other explanations for the use of these caves may yet be uncovered by modern science.

Warehouses

The suitability of Cappadocia's underground complexes for the storage of fruits and vegetables has played a crucial role in the region since the earliest times and still does today. The Greek disciple of Socrates and writer, Xenophon, described Anatolia's underground cave dwellings in his *Anabasis* in 400 B.C.:"The villages and houses were built under the earth. The entrances to the houses were as small as wells, but the rooms were very spacious. Animals were housed in several rooms. Extra passages were also built for them. The people reached them by stairs. Goats, sheep, cows, poultry and the like were bred in the stalls. They were fed on straw and hay. Corn, rice, vegetables and barley beer was stored in large pots. They drank through straws out of these pots until their thirst was slaked." [14]

The special geological and breathing qualities of the thick-layered volcanic tufa allowed grain and other seeds to maintain viable over several decades. They were therefore quite possible also stored for emergencies and catastrophes. Early in history people realised how to take advantage of these rocks qualities by excavating caves for numerous uses to adopt to the often extreme Anatolian continental climate.

The different layers of tufa provide varying internal atmospheric conditions that are used in a variety of ways according to needs. In the Cappadocian town of Ortahisar large amounts of the lemon and orange harvest from Turkey's south-eastern coast are still stored in large underground depots

[13] See also: (http://tatjana.ingold.ch/zeitungsartikel/show.php?hid=2faa98116f1aae167be12798244dee75)

[14] Xenophon. 402 B. C. Anabasis: (Book IV, Chap.5)

today. Forklifts load trucks, and supply the Turkish markets with citrus fruit all year round. It is even said that they become heavier during storage due to osmosis in the caves. Other storage areas with other climatic characters are used to store potatoes, apples, grapes, dried vegetables, cheese and even the "*yufka*" flat bread, which stays fresh in the cave rooms for many month.

Pigeon lofts

Pigeons have been kept all over the region for centuries so that their nitrogen-rich guano could be collected and used to fertilise the fields. Pigeons were kept solely for the purposes of fertiliser production. Excavated pigeon lofts, with these typical small few square small entry holes next to each other, were often painted (with flame patterns or simple drawings of figures or life-trees) and sometimes framed with a metal-clad generally made of recycled canisters to provide martens from climbing in. Some of these 'bird caves' were arranged over several storeys in the tufa slopes or crags, and can now often only be reached by almost undetectable steep one-man tunnels and ladders. Thousands of dovecotes are still an important characteristic of Cappadocia's landscape and culture today.

Inside, the pigeon lofts were arranged so that the birds could breed in specially excavated nest niches in the walls, while sticks were clamped across them to serve the birds as roosts. According to an ancient myth, the pigeon droppings were so important to horticulture and agriculture that neither the birds, nor their eggs could be consumed. Artificial fertiliser has now mostly replaced the once sought-after guano and many old pigeon lofts now are abandoned. For private use however, the natural guano is still very much preferred by gardeners for growing their own vegetables.

Isolated hermitages

Until ten years ago, one of the last hermits lived in these Cappadocian valleys in a primitive cave dwelling, subsisting on modest cultivation of vegetables and foraging. He had broken off all contact from his wife and Turkish village community and lived self-sufficiently in extremely simple hygienic conditions without electricity or running water. This is what life might have been looked like around the 3rd century, when early Christian hermits went to Cappadocia to live a godly anchorite live in the remote valleys.

The first known cave-houses near Göreme were for sure be owned by hermits. They created for themselves minimalistic housing, carved out of the volcanic rock, building homes that were only as large as was strictly necessary. It was also the time of the pillar-saints like Saint Simeon Stylites, who lived in enclosure high up in a little cave-room on the top of the tufa hoodoos to escape the troubled ordinary world below and to gain new spiritual experience. In this age of mystics, the area around

Cappadocia was sparsely populated. There were probably only a few small settlements that had remained since Persian, ancient Greek and Roman times.

Byzantine monasteries

In the 4th century the young monk Basil of Caesarea (nowadays Kayseri) arrived in Cappadocia, where he founded a monastery (possibly in the area near today's Göreme Open-Air Museum). He took the view that the way to God could not be found through asceticism alone or by living as a hermit. He claimed that a virtuous life should involve living and working in the community, accompanied by intensive Bible studies a practice known as "ora et labora". These became the new monastic guidelines. "Basil became the father of Christian monasticism, which he wanted to found not as a separate sect of Christianity, but as a model for a brotherhood of the Christian faith, in which its original ideals were kept alive. They were of one heart and one soul . . . they shared all they had…""[15]

Basil of Cesarea's teachings are still a major influence on orthodox Christianity today.[16] He was also well known for his care for the poor and underprivileged. Together with his younger brother Gregory of Nyssa (commonly identified as today's Turkish province town Nevşehir, but most probably situated in today's village of Harmandalı near Ortaköy/Aksaray), and their friend Gregory of Nazianzus (today's village of Nenizi/Güzelyurt east of the neighbouring province town Aksaray), became known as the "Cappadocian Fathers". During their lives these three erudite friends attempted a synthesis of a humanitarian Greek and Christian philosophy. They also greatly influenced the orthodox doctrine of Trinity, supporting the concept of the "holy spirit", which they helped define, at the first Council of Constantinople in 381.

Over time, other groups of Christian believers were drawn to this new teaching and settled in Cappadocia's fertile valleys to build their cave-dwellings. They founded new communities and excavated even huge entire monasteries and well documented churches of various styles and sizes, which were accurately subtracted out of the tufa. Some of these "negative matrixes", included (structurally unnecessary) vaults and pillars, copied from other Byzantine church buildings. Over the course of centuries numerous structures ranging from the smallest chapels up to huge triple-naved basilicas were detailed modelled out of the tuff. Who knows, maybe also acoustic reasons attributed complementary to the interior architecture. This characteristic can still be experienced today at some occasions, when visitors of these old cave churches sing in chorals or musicians play their instruments.

Ashlars simulating dressed stone were often incised on the walls of the

[15] Joseph Cardinal Ratzinger. 1981. Das I. Konzil von Konstantinopel 381. Seine Voraussetzungen und seine bleibende Bedeutung. In Communio 10
See also the Acts of the Apostles, 4.32
[16] http://en.wikipedia.org/wiki/Basil_of_Caesarea

cave churches, imitating "stone-on-stone"-built architecture. Later churches were often decorated with sophisticated frescoes, many of which can be seen today such as at the Göreme Open Air Museum, now frequented by more than 2,2 million international and domestic visitors in the year 2010. Particularly striking are the pillar stumps, which would normally provide structural support; instead in many cases, the "supporting" pillars hang now like stalactites from the ceiling. Other pillars are lined up in bent, bowed forms, moulding into the vaults of the excavated churches. So much here seems paradoxical.

From the 6th to the 8th centuries the monastic communities and Byzantine soldiers settled in Cappadocia where they repeatedly faced enemy incursions by murderous troops of Persians and Arabs, who broke through the "Cilician Gates" from across the south-east, Taurus mountains or the eastern planes of Malatya. Hence many of the cave dwellings and underground monasteries were designed to serve as defensive refuges, fitted with long escape tunnels, secret access to water and hidden rooms, which, just like the "underground cities", were impregnable and could be hermetically sealed. The rock cut churches built here were practically invisible and their entries hidden. Wherever the rock formation was suitable, secret rooms or small chapels were built, always seeking to keep open potential escape routes and access to water. The "underground cities" on the plains were extended and once again put back into use. During these dangerous times , probably every inhabitant of Cappadocia was provided with an underground hideout close to where he or she lived.

Cappadocia was at its peak in the 10th and 11th centuries. Local agriculture and trade were highly developed and Cappadocia's monastic communities were now well established. The art of fresco painting, affordable to the richer monasteries, was at the highest point of its development and extended to suitable churches and chapels. Besides the many monasteries and "underground cities", there were also various independent farm estates around the Cappadocian heartland. These were maintained by the Byzantine administration for the production of large crops such as wheat, beans and lentils. Here too, harvests were stored underground, as is proven by the many depots and silos in the cave complexes mentioned above. Some of these Byzantine estates had their own chapels, which were often mistaken as underground monasteries.

"Fairy Chimneys"

Cappadocia is famous for its so-called "fairy chimneys" (*peri bahcaları*) or hoodoos, cone structures that have been excavated often with several storeys almost like termite mounds. In case of enemy attack, the inhabitants retreated into the tops of these conical structures. The fairy chimneys' upper storeys could only be reached by means of vertical access shafts, provided with regular step-holes on the sides. In times of danger, these hides could be closed off from above usually with rolling stone slabs or trusted stone cover plates. From here one could get a good overview of the area below and also some daylight, unlike the dark and rather uncomfortable underground cities. It was utterly impossible for any

invaders to capture these tuff strongholds. The people who hid themselves here would have kept large supplies of water and dried fruits etc., enabling them to survive for quite a long siege.

It can be assumed that attackers would have been far more interested in Anatolia's important strategic main cities and in controlling major connecting roads to let themselves be held up by well-hidden Byzantine Christian monks. These old Cappadocian religious communities probably only had to hide out for a matter of hours, or days in times of crisis. It may even be possible that in many of the remote and hidden valleys they have not been bothered at all.

Centuries later, when Turkish nomads came upon the cave area and its strange tufa cone structures (long since abandoned by the early Christian monks) they could not imagine how people would want to live in caves at such impractical heights. The Turks of those times believed in 2001 stories of how the chimney like dwellings had been inhabited by fairies. Because these rooms where only reachable through vertical chimneys, this might be the reason why these unique hollowed tufa hoodoos were called "*peri bahcaları"* in Turkish. Once the Turkish Ottoman Empire had reached the height of its power and the Anatolian heartland had prospered without fear of enemy incursions, the Turks (now the majority of the region's population) began to build new "stone-on-stone" farmsteads at the foot of the tufa cones. These extended carved rooms now fell into fell into disuse, if only as highly appreciated pigeon lofts.

Turkish Cappadocia

The Seljuks invaded Anatolia in the years after 1071. They conquered the Byzantine army at *Manzikert*, and increasing numbers of Turkish nomads migrated from Central Asia to Anatolia. These people were mainly from the old Oghuz tribe, who had lived as nomads in the 10th century in the Kazakh Steppe in Central Asia.

The Turkish Seljuks were reported to be generous and high-minded conquerors who respected the local culture of the Anatolian soil. The nomadic tribal groups moved constantly without a fixed home. As independent tribes, they were always strangers who relied on the help and goodwill of local populations (who would traditionally grant them guest and grazing rights for their animals for at least three days). This period was characterised by mysticism and a humanistic tolerance. Turks' proverbial hospitality probably dates from this time.

However, the privileges of the autochthonous Christian population changed over time. Since many did not really trust their new Muslim rulers, a large number of monastic communities migrated slowly but steadily towards Greece, Bulgaria or Russia and founded new communities over there. Some monastic communities in Cappadocia however, came to terms with their new Turkish-Seljuk rulers and, after paying a poll tax "*Jizya*" (imposed under Islamic law on non-Muslims) the ancient local Christian communities were able to continue their existence in peace.

In the church of St. George (*Kirkdamatlı*) in the Ihlara Gorge there is an old inscription in a fresco mentioning the names of the Seljuk Sultan Mesud II (1282 - 1305) and of the Byzantine emperor Andronicus II. It is seen as proof of the tolerant and peaceful coexistence of the Muslim Turks and ancient Christian population. Long before its renaissance in Europe, this humanistic ideal flourished in the Muslimic East eight centuries before.

The arrival of the medieval West and its often barbarically plundering crusaders brought with it the pursuit of wealth, power and avarice. This was a clear contrast to the rather tolerant and mystically orientated culture of the Seljuks, whose principles based on respect and rather humanistic attitudes. The death of the emperor of the third crusade Frederick I Barbarossa (the last great Christian Holy Roman emperor) may therefore symbolise that contrast: The crusaders fell, while riding his horse into the waters of the *Saleph* (Göksu) river near *Seleucia* (Silifke), and drowned on June, 1190, most likely because off his heavy inflexible armour.

Other communities of the formerly autochthonous Greek population of Cappadocia continued to farm and practice their Christian faith and lived peacefully for centuries in close proximity to their now predominantly Turkish-Muslim neighbours in Anatolia. The Greeks were capable farmers and traders with well-developed trading connections up to Istanbul. The prosperity they achieved enabled them to build sophisticated houses with detail rich stone- and woodwork, which relicts can still be seen in the old Greek towns such as *Sinasos* (Mustafapaşa) today. Only in 1924 did the last Greeks in Cappadocia have to leave the region as a result of the Turkish-Greek population exchange. Hence we can recognize that Christian and Muslim societies lived together with each other for many hundred years in a general peaceful neighbourhood.

Since that time, apart from small Alevi groups near *Haci Bektaş*, Cappadocia's population has consisted of mostly of Turkish Sunni Muslims. The Ottoman Empire developed a strong, central power, and there remained no reason for Cappadocia's inhabitants to hide themselves in cave houses and "underground cities". Although the region no longer feared enemy incursion from abroad, occasional attacks by Ali-Baba-type bandits had been a problem.

The area's local inhabitants still remember stories of a gang of so-called "felt-slippers" (*ayak keçiler*) who, in the 18th Century carried out infamous deeds around the towns of Cavuşin and Göreme (then called Maçan). This gang was notorious for kidnappings and seducing the unmarried girls of the neighbouring towns. At night they would quietly creep into houses, through unlocked doors and windows. Just as Romulus and his men did with the Sabine women, the "felt-slippers" kidnapped girls from their traditional family homes. Whether this turned out to be an occasion of one-sided or mutual joy (as with the Sabine women) remains unclear. The bandits barricaded themselves in nearby multi-storey tufa cones, which are referred to today, as the "Maiden Fortress" (*Kizkalesi*). According to the local tales, the fathers in the neighbouring towns

organised and armed themselves with swords, and set out to take back their daughters, in the valley subsequently known as "Sword Valley" (*Kiliçlar*). After this, local people barred the doors and windows of their houses. ------

At this time more and more Turkish nomads were using the abandoned ancient Christian churches and monasteries as stables and storerooms, purposes for which they were eminently suited. Some old, beautifully decorated churches were also converted into pigeon lofts. The church frescoes of the old Byzantine masters were already being destroyed at that time, because the newly settled Turks, fearing the "evil eye", tried to scratch out the faces and eyes on the frescoes to obliterate the images prohibited by Islam. Despite this damage and other graffiti, over the past 100 years, many of these artistic and valuable frescoes remain remarkably well preserved today.

Houses and Turkish cave homes

The early Turkish nomads initially only used the old cave dwellings as stables and storehouses, sometimes pitching their multi-purpose tents they used for private living in front of the caves. Over centuries of tradition, the tented spaces for the nomadic men and women were clearly divided, and the space would be arranged according to the time of day and its requirements. The centre of the living room was usually left empty. At mealtimes a round tabletop (*sini*) was placed in the centre on a cloth just a few centimetres above the floor, and those present drew it over their legs, so diners had their feet under the table. After meals the tabletop could be quickly removed and the dining room transformed within minutes into a bedroom by rolling the "futon-type" mattresses stored along the sidewalls out into the centre.

Soon the Turks, by whom many only settled in this area a couple of hundred years ago, carved out new winter-proof cave homes from the tufa concerning their individual needs. They considered their traditional internalized housing customs and applied their own ideas, which they had been passing down over generations. The contrasting ancient Christian cave dwellings usually consisted of many interconnecting chambers with many partitions dividing the sacred spaces and underground strongholds. These old spatial partitions were alien to the Turks, whose ideas about housing were based on a "single-space" tent architecture, which they applied within the tuff-stone caves. Because of the distinct advantages of these well isolated cave houses, this form of living within the tufa became popular and the old nomad-tents were forgotten. The cave homes proved to be cool in summer and warm and easy to heat during the cold Anatolian winters. Tuff-ashlars were sometimes carved out and dressed right on the site of a new cave excavation and reused in attached walls for annexes, half-open bow-shaped entry halls (*çardak*), and arched "belt-rooms" (*kemer-dam*). This resulted in a form of housing that developed without being planned by architects or using imported materials. These houses were all built with respect to the regional conditions and climatic aspects (which are so important for Cappadocia) where always taken into

consideration.

A unique characteristic of Cappadocian cave dwellings is the variety of quality building potentials. As mentioned, the regional tuff is easy to work, so purpose-built cave dwellings can be created fairly quickly and easily. The material is free of charge and does not involve any transport costs. The 'breathing' porosity of the tuff provides an optimal interior climate, and regulates inside temperatures, preventing interiors from becoming too hot or too cold. As local people will tell you, a classic cave dwelling with traditional fire places could be kept warm in winter with just an hour of fire in the morning and evening. This was a vitally important feature in this poorly treed area, which provides few sources of fuel, especially in earlier times before the income tourism.

A form of housing that is excavated by removing material in a "negative" construction method, follows different principles than those used in building the regular houses we know today. Not adding, but removing material creates space. The area's traditional inhabitants tell how new shelves would be simply carved out of a wall when more room was needed in cave dwellings, and thus the spaces grew. In conventionally built houses, new shelves must be added to rooms, thus consuming space and decreasing the available space in the rooms.

Over time these regional forms of housing were constantly adapted to their inhabitants cultural conditions and ideas of housing. While in early times the caves were predominantly military facilities, in Turkish times new cave dwellings of a different type were built, or old ones from byzantine times had been transformed to meet the new inhabitants cultural and economic demands. Next to hewing caves, new wall- and ashlars constructions were built around the tufa cave rooms, which of many were used for storing different goods (like the local flat bread (*yufka*) or even fresh grapes) over a period of many month. Other simple hewn ashlars were used for the high surrounding walls of the inner courtyards (*avlu/hayat)* and the building of latrines.

Today, various combined house-cave dwellings can be found in traditional Cappadocian towns. But most of the Byzantine monasteries and cave dwellings hidden in the cliffs outside the towns are now abandoned and only tourists looking for adventure crawl through them.

"AFET evleri" / Catastrophe houses

During the 1960' and 1970', more and more people from the traditional cave-house neighbourhoods were relocated into new, basic housing estates, subsidized by the government. The so called "AFET" program (meaning "catastrophe") started after some rocks collapsed in the neighbouring villages of Zelve and Çavuşin, almost 50 years ago, killing a few inhabitants living in the old stone houses beneath. But the new houses provided by the government program were cheaply built. They were not provided with any insulation nor did these houses pay any consideration to the peoples' previously accustomed modes of living.

In the beginning, many of these old tufa cave dwellers reacted by readopting a rather vernacular architecture; customizing the AFET-houses, in order to suit their traditional and local living habits. At first, they built new toilets in the traditional way, positioning them a few feet away from the house. The Turkish architects of the standard AFET-houses had planned and fitted the bathrooms right next to the kitchen (which makes sense in terms of plumbing and keeping costs low). However the traditional beliefs of the communities considered the toilet as an unclean area of evil spirits. The architects had obviously not taken this fact into account at all. The ex cave-dwellers also built big stonewalls around their houses, using traditional tuff ashlars to create an open and protected inner courtyard (*avlu/hayat*), where the women could work with privacy, protected by curious watchings from the street. The relocated inhabitants also added new traditional-style rooms to the original cheaply built AFET-houses since the people (many of them still farmers at that time) wanted to take advantage of the isolating and ventilating qualities provided by the tuff for storing goods and keeping animals.

Local farmers in time complained that the new AFET-houses had been built by bureaucrats for bureaucrats, without consideration for their needs as farmers. The inhabitants soon realised, that the new built houses consumed about ten times as much energy during the cooler six months of heating period compared to the old well isolated and energy efficient tufa caves. In an area proving only limited amounts of brushwood (which would have been collected from the gardens and nearby vineyards) they were guaranteed sustainable heat and fire throughout the year. After the relocation, many people had to buy tons of coal (with money they often did not have) to be able to heat these dysfunctional subsidized new houses. In summertime, further problems were encountered, as the new builds got uncomfortably hot.

The interesting thing about this whole resettlement campaign was not only that the inhabitants did not accept their new houses the way they had been given to them by the government, but also they readapted their new houses to suit their cultural customs and functional requirements. Within the decades, the AFET-houses were transformed several times, so today we can only see a few original examples within these quarters, which are now mostly outnumbered by traditional architecture or newer two storey "Duplex"-style houses.

Cave hotels and World Cultural Heritage

In 1985 the Göreme-Cappadocia National Park was added to UNESCO's World Cultural Heritage list gaining a status not only as a cultural, but also as a world natural site. At the same time, Turkey's Ministry for Culture and Tourism invested in a large-scale advertising campaign to encourage tourism to the area. Until this time, the area had been visited by only a few individual travellers; attempting to trace the Hittites, often travelling with cars and equipped for camping. In the late 1960's and 70's hippies arrived, drifting through on sweet clouds of hashish and making spiritual

pathways overland to India. There was a complete lack of well-developed tourist infrastructure at this time.

In the surrounding towns of modern Cappadocia, Ürgüp, Avanos and Nevsehir, large all-inclusive hotels were built with the help of subsidies from the Turkish government. Development took off in the central village Göreme, which was almost like an island in the middle of the National Park. The first simple cave hotels in this little town opened in the early to mid-1980's. These initiatives were taken by individual inhabitants, who converted their old cave homes into simple pensions to give backpackers an opportunity to spend a night in a real cave dwelling for 10 US dollars or so per night. Those days are now past, and these once very simple but often charming and very personal low-budget pensions have developed in into elaborately decorated "boutique hotels" that now provide travellers (with money to spend), with exclusive and very comfortable accommodation including the experience of a Yakuzi-bathroom as well as mini-bar and TV in the room.

The numbers of tourists, coming from all over the world have risen sharply, and now exceeding the two million mark annually, meaning that the region's traditions and cultures are becoming less important. In many places the only aim seems to be to earn as much as possible from tourism as quick as possible without taking into account any sustainable options. The owners often orientate themselves on the tried and tested concepts of the rapid expanding hotels in the neighbourhood. Today even new building styles have consequently emerged, which, although generally well built and beautifully decorated in many ways, no longer fit in with the traditional customs of the vernacular Cappadocian Architecture.

"Disneydocia"

Things are changing rapidly in Cappadocia. One can still feel the pulse and rhythm of traditional life in the more remote quarters, but in the towns that are easily accessed by tourists, a lifestyle is increasingly emerging that is no longer based on tradition, but pursues mainly monetary interests. Unfortunately, the aspect of sustainability, in relation to the strong growth of tourism, has been barely considered and, if so, only modestly. The impact of the tourist industry, with its high profits, has resulted in the development of new forms of life and mixed forms of architecture, characterised by sometimes exaggerated and often kitschy building designs.

Carved old stones from historic Armenian houses had often been "imported" from 100 km away, and architectural decorations with no direct sub-regional, or cultural background are appropriated from old Greek towns and incorporated into new buildings and hotels. The latest "boutique hotels" have nonetheless proven very popular among tourists, as newcomers to the area will never be able or even interested to focus on these issues of detail. Hence today, unfortunately, little attention is paid to the different sub-regional building and decorative styles of Cappadocia's various ancient communities. The decorative and "old fashioned"

architectural elements, which have been copied from ancient Greek villages can be found in new construction are frequently badly shaped.

In earlier times, each village had its own stonemasons, who adhered to local architectural decorations, handed down over generations. Each Cappadocian village once had its own particular style so each village in Cappadocia was distinguishable from each other. These sub-regional nuances have now generally been forgotten and gone unrecognised by the UNESCO World Cultural Heritage Commission. Besides the many excellent studies of the churches from Cappadocia's Byzantine era, there exists, by contrast, little documentation[17] focusing on the traditional diversity of the traditional Ottoman-Turkish village cave dwellings.

The main trend today is to exploit Cappadocia as far as possible for mass tourism. Things that seem unsuitable for this purpose are often destroyed and traditional economies are in sharp decline. An entirely new tuff stone architecture is developing in some areas, with new, often out of place 'cave palaces' and huge function rooms including seating and bar-areas hewn out of the volcanic rock where Turkish folklore and belly dance events take place every evening.

An alternative model: Ideas for a future of new cave dwellings and sustainable energy usage.

The topics of sustainability and international "eco-tourism", which are gradually becoming increasingly important, are giving rise to a need for a new kind of tourism industry in Cappadocia which could tie in traditional customs, and make use of typical regional buildings and living styles. As mentioned above, a wealth of new "cave room" pensions and "boutique hotels" in various categories have been established, some of which offer an astonishing good insight into traditional building and living forms. The interest from foreign visitors in this form of architecture has also increased the status and prestige of this formerly, and apparently primitive, peasant housing. Today it is becoming even chic to live in a cave!

However a new cave dwelling architecture (which could benefit from the unique interior climatic conditions of dry tuff and be accompanied by sustainably sourced energy supplies appropriate to modern day living standards) has yet to be developed.
The historic buildings protection authority strictly regulates new carvings or restoration of tufa caves within the historically significant areas around the Göreme National Park. However some outside areas are not subject to these protection regulations, meaning that there is the potential for pioneering sustainable cave dwelling architecture in which combinations of new high-tech materials could be experimented with.

[17] cf. Andus Emge, 1990. Wohnen in den Höhlen von Göreme. Traditionelle Bauweise und Symbolik in Zentralanatolien. Ph.D. Dissertation Univ. Heidelberg. Dietrich Reimer Verlag, Berlin.

In the early years of this millennium, a group of architects from the "*platform_c*" network and the "*Cappadocia Academy*"[18], sat down to work out how a new modern cave architecture could be created and adapted to meet current housing needs and combine highly-efficient construction technologies, with sustainable energy systems. The goal is the creation of an ultra modern Cappadocian 'zero-energy' cave house (which is author has been thinking about for some time). Unfortunately, although pilot projects and workshops have been run, such "master-houses" have still to be built and are dependent on sponsorship.

It may only be a matter of time until the first prototypes combine the advantages provided by the well-insulated tufa cave construction (for temperature and ventilation regulation) with new insulation glass and solar technology. It would be interesting to investigate ways of using modern passive and active forms of energy in a new and modern form of cave dwelling construction that would also integrate hi-tech elements in today's Cappadocia. Architectural history of respective localities would always have to be taken into account in plans for such futuristic cave homes. It may not always be feasible to create strikingly different "modern" cave housing as part of broader urban and landscape planning, but various initiatives should be pursued where possible.

In terms of sustainable technologies, it should be noted that solar heating systems are already widely used on houses in Cappadocia, effectively heating large quantities of water without producing emissions. There is, however, a conflict between the widespread use of these often quite unattractive solar systems and the architectural aesthetic of Cappadocia, particularly in the classically developed UNESCO World Cultural Heritage towns of Göreme and Uçhisar. It would be preferable if these highly effective, but visual polluting solar heating systems could be removed from the roofs of some classical houses and replaced by a central hot water supply.

There are many geo-thermally active zones in Cappadocia, so geothermal energy could be tapped (trials are already being underway in Uçhisar). One can even imagine a central, highly efficient solar energy farms in a specially defined non-disturbing area in Cappadocia providing a whole district with heat and even photovoltaic electricity. Such a system would also avoid direct conflict between the new – and in principal very welcome – sustainable solar heating technology and the classic architectural aesthetic in those historic towns. There is no doubt, that the old Cappadocian villages require a much higher degree of protection within the UNESCO World Cultural Heritage program. An innovative investor to finance such an initiative however needs to be found.

We can all, as local inhabitants or as visitors to Cappadocia, contribute to move towards healthy change through our own behaviour. Sustainable culture and eco-tourism will become increasingly important in the future. As well as understanding the traditional regional economy and the ways in which Cappadocia's cave dwellings are used, we should be prepared to

[18] www.platformc.org / www.fairychimney.org

take a bold architectural step, beyond standard copied construction and restoration. Only by looking forward we can meet our current housing needs and realize them in modern, functional cave architecture for a new era, respectful to the aesthetics and efficiency of this long Cappadocian cave culture of the past.

About the author: `

Andus Emge completed his doctorate with a cultural anthropological dissertation on the change of the traditional cave dwelling life in Göreme in 1989. He later on produced a 45" film for German TV on the topic. After several years of independent academic work at Heidelberg University and at the ethnographic Rautenstrauch-Joest Museum in Cologne, Emge returned to Cappadocia in 1998. Here, as well as initiating the "Cappadocia Academy" and organizing several workshops and pilot projects, he established a small authentic cave hotel, called the "Fairy Chimney Inn" (www.fairychimney.com). That way income from tourism directly funds the projects developed by the Academy.

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