

**Old Order in New Space:
Change in the Troglodytes Life in Cappadocia**

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Abstract:

In the volcanic tuffa area of central Turkey people still live in hand dug cave dwellings. These troglodyte dwellings have been used by the locals since the early days of Christianity. Today most of the cave dwellers are Turks with a rural Islamic tradition. The caves can be shaped to fit exactly the needs of the inhabitants. Internalized room conceptions reflect clearly in the structure of the traditional habitat. Over the last twenty years the government has resettled old cave inhabitants into new "European-style" houses, considering the old cave dwellings unsafe and unfit to live in.

Cappadocia, also known as the region of Göreme is situated in Central Anatolia, roughly 200 kilometres Southeast of Turkey's capital Ankara. Today the province is called Nevşehir (FIG. 1). This wide landscape of volcanic tuffa stone around *Erciyas Dagi*, a 3916 m high volcano has been known since at least the neolithic time, because of its special geologic formations and its natural resources, namely obsidian which used to be a famous commodity in pre-historic times. Centuries of erosion sculpted bizarre valleys and tuffa stone cones, ideally suitable to shape man-made caves (FIG. 2).¹

The climate of Cappadocia can be extremely hot and dry in summer with temperatures often ranging up to 35-40° C. Winter on the other hand can be bitter cold with temperatures down to minus 35° C. Due to sporadic rains and the quality of the fertile eroded tuffa soil with excellent water storing qualities, this landscape has intensively been used for gardening and agriculture, which again correlates directly with the local troglodyte architecture.

Caves can be dug out of tuffa stone with simple tools like pickaxe, hammer, jemmy and adze (the surface of the relatively soft stone hardens later on exposure to air) so the material is ideal for constructing expansive cave-rooms. The tuffa caves have an extraordinary room climate (fresh grapes or bread will last and stay fresh for months if properly stored) that again influences agricultural habits. Specially the grapes are Cappadocians' main agricultural product. They grow extremely well on the eroded tuffa soil, and are marketed in many forms such as fresh grapes, raisins, grape syrup, wine or vinegar. They are one of the most important basics of traditional subsistence economy. But also apples, quinces, walnuts and apricots find very good growing conditions on this fertile ground and can be ideally stored in the extensive caves.

Besides a lot of qualities and advantages of the men made cave dwellings as living space, the storage capacity of these tuffa cave rooms were one of the major influencing factors of the development of settledness in this area.

The cave architecture of Cappadocia is not only distinguished by a "one stone on to the other" work of construction, but so to speak a building style of the "negative", where the inside is scooped out of the tuffa stone. Living space is created by taking away, digging out and removing the material out of the tuffa. Highly functional inside the Cappadocian cave dwellings are invisible from the outside.

Being very practical in many ways they have given all inhabitants in every epoch complete freedom to shape habitats according to their specific personal needs. Every niche, every wall shelf is an expansion to the area, enlarging the living area by taking building material out, whereas in a "stone on to stone" architecture the living space becomes smaller by putting things inside.

Because in this type of architecture there is no cost for building materials and it's transportation to the sight. It is a very economic building style and also ecologically interesting alternative. Furthermore there are almost no costs in up keeping the structure; no leaking roofs or rotting beams! Therefore we still find cave dwellings that have lasted intact for nearly 2000 years.

The early Christian Cave Dwellings

Though the tuffa region of Cappadocia was probably temporarily settled as early as the neolithic period and gained strategic importance in hetitty and phrygian times, the earliest historic descriptions we find is from Zoroastrian peoples that lived on the hill side of the volcano *Erciyas Dagi*, worshipping a fire-cult but not yet having developed an expressive system of cave settlement.

The actual settlement of the area in the tuffa region of Cappadocia begins, as far as we know, with the arrival of ascetic hermits in the first century AD. who moved up to the remote valleys to be able to live a god fearing anchorites life. During the following decades and centuries, more and more Christians moved to Cappadocia hiding in the soft tuffa stone from the invading Persian and Arabic troops.

The needs of the persecuted Christians led them to incorporate special safety features in their caves, lending them security through defensive measures and calculated safety precautions. It was probably also this population that constructed the large underground cities like those of *Kaymakli* and *Derinkuyu* that securely homed a population of around 10.000 persons. These multileveled sub terrain towns could be sealed off by blocking the few entries with doors like mill-stones in times of danger. By building large storage areas, underground wells and complex ventilation systems as well as by connecting a few kilometres long passages - all of them in the

underground (and constructed without the help of a compass) - a Holocaust of Byzantine Christianity in Cappadocia could be prevented in those days.

Even in times of persecution the Christian community built special rooms for religious service. Hidden cave churches have been found all over Cappadocia sometimes even featuring statically functionless vaults and columns shaped out of the tuffa in the architectural sacral building style of that time. Many of these underground churches have elaborate frescoes which still last until today (and have made this region at present to a popular and well known tourist attraction in Turkey) (FIG. 5.).

After having settled in this area as hermits, the Christians later began to live in communities and cave monasteries necessitating larger assembly- and dining-halls in which sometimes even the tables and benches were carved out of the stone. Passages and chimneys connecting the rooms with each other were built everywhere during that times of threat (FIG. 6.).

This highly developed sacral-cave-culture found it's end in the 11 th century, when the Islamic *Seldschuks* from Central Asia invaded the area. Though the local Christians were now allowed to practice their religion openly without fear of military persecution of the invading troops from the east, the downfall of the Byzantine empire also meant the loss of centuries old artistic knowledge of sacral building.

In the following period, more and more Christians also started building houses as annexes to their formerly hidden caves and continued living in this region, though in decimated numbers side by side with the regional Islamic Turks, up until the 1920 ties.

The Turkish Cave dwellings

As a result of the Seldshuks occupying minor Asia, Turkish tribes began to settle down in the neighbourhoods next to the Christian population. These people, being of nomadic origin, had different needs and requirements for living space than the old Christians who had been settlers for a long time. So the Turks built new cave houses or modified the vacated dwellings of the former Christians according to their own requirements.

The roots of the internalized old Turkish concepts of living space can basically be followed back to their life style in the *Jurte*, which is a single multi purpose living space, wherein all functions are incorporated most efficiently (FIG. 7). In contrast to the Byzantine defensive system of cave construction with manifold entrances, hidden flight passages around a communal living area, the Turks prefer rooms with only one entrance from one side which mostly opens out to a central inner courtyard (FIG. 8). This courtyard, called "*avlu*", is traditionally surrounded by a high wall and arched gate, that allows the Muslim woman to have a protected open air space to do her daily work, without being seen and observed from the outside. Furthermore, the inhabitants need to accommodate different kinds

of household space like kitchens, storage rooms, stables, cave basements, some of which are dug 50 m deep into the tuffa stone.

Just like the Christians of the post Byzantine period, the Turks also build annexed rooms with flat roofs beside the caves (FIG. 9 & 10) These so called "*kemer dam*"s were built out of local tuffa stone blocks. They were arranged as 50 cm wide vault belts, which are displaced next to each other in a distance of about 10-15 cm (Fig. 11). Due to the huge mass of the roofs out of tuffa, these rooms also have climatic advantages comparable to the caves with an excellent natural temperature and humidity regulation.

During the passage through Persia the Turks came in contact with the Persian style of building, which they later combined with their own ideas and tradition of living.ⁱⁱ Not only Persian influences but also classical Hellenistic elements found their way into the later regional architectural style of Cappadocia. The half open hallway, in Cappadocia mostly constructed out of vault belts, displaced next to each other like in the "*Kemer dam*"s described above, reminds us of the old Greek "*Megaron*" out of the bronze-age, with their groundplans almost like a straight-sited horse shoe.ⁱⁱⁱ

In the two storey houses and cave annexes, the top floor usually widens outward over the bottom floor about 15-20 cm making a kind of moulding or overhang (*cikma*) above the ground floor. This has the advantage of enlarging the space in the top floor. But above all, the "*cikma*" lends shade to the ground floor during the hot summer sun.^{iv}

Though having become settled for many generations, a further aspect of the influence of the old Turkish nomadic life style can be found in the fact that many people alternate different summer and winter living space, analogue to the movement of the nomads between summer and winter pastures. In winter, the warmer and insulated tuffa caves are the preferred living rooms, whereas in summer the annexed buildings are airier and have more open window fronts to the outside.

In the traditional Turkish way of life usually three generations share a common household under one single roof. Families live virilocal, which means that women move to their husbands families after marriage. The construction of living areas and the choice in the type of housing widely correspond to the preferences of the population inhabiting the area. This holds true for the former Christian population as much as for the Turkish settlers today. There is no question that next to the cultural aspects also natural and geomorphological aspects play a decisive roll in determining the special form a building will display.

Symbolics of the Traditional Living Areas

The traditional form of Anatolian settlements is determined by the "oriental style ground-plan". Planless paths and roads run outward from the village centre connecting the households and living-quarters with each other which

means that the network at the same time also connects every house directly to the village centre. Paths branch out, sometimes interrupted by small squares from which dead-end ways emerge, leading to specific households (FIG. 12).

Turkish settlements develop without any centralised planning. Their form therefore reminds us of organic grown structures. The different cultural ideas of room design are reflected in the anonymous architecture, though this may often be an aspect outside of the consciousness of the builder.

The dichotomous character of spatial and social boundaries plays an important role in the life of oriental people. Outside and inside, above and below, male and female, right and left, cold and warm, or dark and light. Besides the natural and topographic circumstances mentioned above, all those aspects have a strong influence on the building style and have been essential in developing form and construction of housing and its spatial surroundings.

The village centre (*carsi/merkez*) is considered to be the navel of the setting. Here one usually finds the central mosque with its over-towering minaret, the tea-house, all kinds of shops and offices. This is the centre of the male world. Prestige and esteem are to be learned here and therefore it is the place of constant challenge and provocation. This can obviously be watched in the tea-house, where games like cards, or backgammon played by men, often lasting day in and out keeping them constantly occupied. It is also the place that news hits the village and spreads out from. Men who avoid this place are considered to be a henpecked husband (*kilibik*). For women in their fertile years this place is taboo so that even shopping is done by children or men.

The different settlement quarters (*mahalle*) which are connected one to each other by the oriental road system practically form little villages of their own inside the settlements. They often feature their own small mosque, squares, drinking-water wells communal bread baking ovens or garbage collecting spots. The system of paths inside these quarters are laid out in a fashion that can hardly be surveyed by the outsider. This is the public of the women's world. It is here that they can meet each other, talk and gossip while getting water at the well or sitting together doing handicraft. But there is competition here, too. Skill and dexterity, competence in arts and crafts, gift of persuasion are the prestige and image forming faculties comparable to those of the men's world in the centre of the village.

In a "*mahalle*" we always encounter strong neighbourly feelings of togetherness and solidarity, which are probably reinforced by kinship ties which usually exist in a neighbourhood quarter. But this does not imply, that a "*mahalle*" is only formed through kinship relationships. Neighbours where no family ties are present, form a social district community just as strongly. These social units are highly independent and easily controllable by all the local members. This gives an explanation to the Turkish proverb: (*Ev alma, komsu al*) "Don't buy a house but a neighbour"!

The actual border between public and the private space is the threshold of the walled inner court-yard, the "*avlu*" (FIG. 8). Entrance is only possible through a gate which can be closed at any time. The protected family private space begins inside the gate and can only be entered by foreigners on invitation. The "*avlu*" is the main connection between the street and the house.^v The closed courtyard, yet open from above is the main working area of the women. It is preferably laid out to face south so as to catch the sun's warmth for daily work (such as drying fruit etc.). In most cases it has a paving of flat stone-slabs or the soft tuffa ground is hardened with a thin concrete surface. As far as the weather allows women use the "*avlu*" for cooking, washing up or preparing the harvest for storage.

Due to the fact, that the "*avlu*" is not a public platform the women don't have to pay attention to their appearance, as they are obliged to in the Islamic public world. It is possible that a head scarf will slip off without being replaced right away. The "*avlu*" is the real centre of the household and the female world.

Analogous to the living quarters branching off from the village centre, the main living room, the kitchen, storage spaces, stables and the latrine branch off the inner court-yard. In principle all rooms are accessible from this "*avlu*" by their own entrances (FIG. 8). The tap for public water is also situated in the court-yard, but in general this water is only used for non-drinking functions (drinking water is still carried from special springs and wells in the neighbourhood). The latrine which is considered unclean is situated as far as possible from the living area, usually in a corner of the "*avlu*" near the road, so as to keep away the "bad spirits".

The already mentioned half open hallway (*cardak*), annexed to the "*avlu*", is another important feature of the daily life (FIG. 11). Offering shelter from the weather it allows (sometimes considerable) smoke from the main fireplace (*tandır*), which is placed in the middle, to escape easily. Mainly during the summer and the intermediate seasons this living area is used for common bread baking or as a temporary dining room.

The actual living area is usually attainable from this half open hallway and is entered by a threshold which is the intersection between the open and the closed rooms. This threshold is not only a stone on the base of the door but it forms a place in itself which has functions of its own. Called "*seki alti*" a lower entrance area in comparison to higher living-room area is a kind of vestibule in which one does not spend any time, but to remove shoes and to keep dirt out of the living space. This is the lowest point of a room, and not for practical reasons only.

Now, sometimes up to 40 cm higher, lies the actual living room, "*seki üstü*", that is furnished with carpets, pillows and blankets. In rural areas of Turkey people traditionally only use one room for daily life but it is furnished to accommodate many functions in a simple and practical way. This is a multi-functional living room, lending itself to eating, sitting and sleeping. This

concept is almost analogous to life in a tent where space is used dynamically according to several functions, as already mentioned. All utensils are placed at the sides of the room, so that the centre is principally left empty and can fulfil many different functions. At night mattresses and blankets are laid out for sleeping where during meals a flat round tray is set as a table, that is simply hung on a nail on the wall when not in use. During the daytime between the meals this central area is left open. Luxurious pillows and blankets as sitting facilities are lined up along the walls. The walls feature small niches and wallshelves in which bedding and personal things are kept. Even small washing facilities are hidden in walls screened by a small wooden door or curtain, barely devised from the sitting room.

It is quite remarkable that the so far described horizontal division of space from the village centre to the quarters and households is now changed into a vertical one, in which the higher lying areas are considered to be purer and higher in rank than the lower ones. As already stated the lower lying entrance area is reserved for shoes and dirt. The ground floor of the higher arranged living room and here especially the area close to the door is the space reserved for women and children. It is laid out with flat cushions to sit upon. Men, considered as individuals of higher status and guests are seated traditionally on a 20 cm high platform called "*sedir*". This "*sedir*" is covered comfortable with thick cushions and allows an overview of the room as well as out of the windows (FIG. 13). In some classical cases the "*sedir*" has another top heighten level reserved to the person of highest rank with an overall view around the room like from a throne. Therefore there is always the possibility of being seated higher as well as lower then someone else.

This dichotomy in room division and symbolism is extended further upward: At standing- and reaching height there is often a shelf attached to the wall, going all around the room where decorative objects and utensils of daily use are placed and exhibited. This is the upper level boundary line of space used by the inhabitants.^{vi} Above this dividing line only a "*Mahsallah*" inscription can sometimes be found; an area in the space so to say that is reserved to light, symbolising heaven - and God. In some few cases the ceiling centre is elaborately decorated, an element of style which is called "*göbek*" (meaning navel) that can clearly be connected with the old nomadic tradition of the Jurte. Up until this day many people from central Asia consider the roof of their Jurte to be the symbol of heaven and its central opening in the middle, the sun or the eye in the sky, through which light and life descend.^{vii}

Changes in Today's Living Styles

Since the 60 ties the Cappadocian Troglodytes from the village Göreme and other settlements started to leave their centuries old caves - sometimes against their own will - and began to move into newly built houses subsidised by the government. This movement is caused by different facts. On the one hand the government states that the caves have become dilapidated, on the other hand the argument is that they are so cheaply built and primitive that it seems shameful to them that people have to live under

such backward conditions in an area highly frequented by tourism. Furthermore the ideas and the taste of the inhabitants have been altered by a slight economic up swing, the influence of mass media and the ever-growing tourist business, which of course again alters the infra structure and creates a desire for modern housing. Another major influence, which can be observed were the families who went as workers to western Europe or in big towns in Turkey. These people came back with new ideas of habitation and living facilities that they have integrated through the process of migration.

It is a fact that some of the caves have become a hazard due to erosion in this tuffa landscape, and some overhanging tuffa stone rocks have broken off and fell down.

The quarter of newly built houses by the government are paradoxely called "*afet evleri*", meaning "catastrophe houses". They were built and planned with no consideration of the specific local needs and cultural background of the farming inhabitants. The "*afet evleri*" are constructed with high prized building materials such as concrete stone blocks and gable-roofs with red pantiles. Even being subsidised, these buildings represent an enormous financial investment so that the choice between the red roofed new houses and the traditional low-cost dwellings in tuffa is highly influenced by moments of social prestige.

Specially for the young generation, the desire for modernity and western life style is much stronger than the sensibility to the habitational climatic and economic advantages of the cave dwellings. So many of them like to move to the new houses. But pretty soon they find out that these concrete houses have enormous disadvantages: In wintertime they are very difficult to heat because of missing isolation, so that a family needs about 3-4 times more heating material in comparison to the former dry, porous and therefore almost ideally isolated cave dwellings with their thick walls. But not only aspects of material and housing technics prove as a major disadvantage. Also there is a deficit in the way how rooms have been planned and arranged in these houses. One example is that the planners and designers placed the toilets inside the living house just next to the small kitchen ignoring all the traditional customs and habits of the Islamic people.

Another aggravating deficit of the "*afet evleri*" is the lack of storage room for the agricultural products. A local farmer brought it to the point when he said: "these houses are built from bureaucrats for bureaucrats, but not for farmers like we are" (which had been the base of the traditional economy for centuries). There are also no stables or half-open halls like those people had been used to in their old cave dwellings. Even the sight protecting walls around the inner courtyard were missing. Instead the houses had open front yard like Western houses. In those "stone on to stone" built houses people also have to purchase more furniture which also means higher costs. "In former times", as we hear from Hamza, an old Troglodyte, "we carved the shelves right out of the wall as we wanted to. Our rooms therefore became

larger and we really won space. Today in these new-built houses we have to buy the shelves and wardrobes with our little money, but putting them inside, the rooms become smaller and we lose space!" In many aspects all these factors are fatal to the traditional farming society in Cappadocia. Agricultural stock, which stayed fresh for months in the tuffa cave rooms, like apples, the thin flat bread or juicy grapes, get mouldy within a few days.

How do the resettlers of the old cave dwellings react to this new detrimental living situation? We can observe that the first things many families do in this deficient habitual environment is to modify the houses by building and adding new parts in order to make them more functional according to their needs. These changes reflect exactly the old order of the habitual environment of the caves. So first of all almost all resettlers built a new toilet cabin outside of the house in a corner off the new living ground. So that in future "bad spirits" can gather around there in that place distant enough from the house! The next step is to build new high walls around the small garden so that women have again a closed courtyard where they can work in the open air and are out of public sight (FIG. 15). In some cases we also find that the traditional half-open hall is annexed to the new house, nevertheless often built as a simple construction of corrugated iron or plastic.

In other cases even new rooms in the traditional regional style were built next to the new "*afet*" houses. Mostly these are one storied flat-roof houses sometimes even built in the sophisticated local arch-belt "*kemer*" style. The flat roofs, which usually have a thin concrete surface to protect from rain are at the same time to dry fruits or are used as an additional working area; all of that is not possible on the gable roofs. The additional tuffa arch-belt rooms that local people built also annexed to the new houses, are favoured as storage rooms or stables because of their climatic qualities similar to those of the caves.

Even most of the disadvantages of the interior design, like corridors can not be changed by the resettlers, it is clearly seen, that own internalized traditional space conceptions are readapted as far as possible to the new houses.

The inhabitants therefore don't come to terms with the centrally planned structure of the dwelling space, but change their closer habitual environment according to their residential needs. The outcome is that by the end sometimes we only see the red roof of the former "new house" which in the meantime has been more or less overgrown by newly built anonymous architecture (FIG. 16).

But next to this traditional oriented reaction of the inhabitants there are more or less westernised occupants who don't want to have to do anything with that "traditional stuff". These people, being in the minority, agree with the type of western house the government gave them. They break with the traditional and sometimes strenuous life, based on agricultural subsistence and become dependent on an income from the outside, basically on the

growing regional tourism. But during the long winter months and at times when the tourist business slows down (for example during the II Gulf War) they are still supported by the traditional living parts of the family clan.

Last but not least there are many different intermediate stages of habitual behaviour inside the last described groups, changing slowly within the many-generation households. Therefore changes in habitation are not radical but develop step by step and by no means always in one direction.

At the end, a new and changing aspect of the old caves as living space should be mentioned here: Since the beginning of the 80 ties some troglodytes of Cappadocia change their old cave dwellings, mostly with an enormous amount of money, into nice and comfortable cave pensions equipped with warm-water tanks, showers and beds. These are one of the nicest accommodation alternatives in this region - mostly clean, cosy and generally low priced. Being now used by fascinated western tourists, the cave dwellings, considered by the government to be dangerous, unclean and old fashioned, are gaining prestige from the local inhabitants point of view, so today we even have a few examples of real "modern" re-resettled Troglodytes!

Conclusion

Since almost two thousand years the cave dwellings of Cappadocia play a major role in the regional architecture. During that period many different cultures inhabited this area and used special cave dwellings due to their internalized specific needs. Untill today many hundred people, now Turks with Islamic tradition, inhabit this exceptional kind of dwelling. The tuffa caves are easy to build at a minimum cost with simple tools. The climate inside is optimal for living and storing: cool in summer and warm in winter. Once a dwelling is carved there is almost no need for further maintenance - no leaking roofs or rotten beams etc. So these tuffa caves are still the best economical and ecological house form in Cappadocia.

Over the last twenty years the government has resettled most of the old Troglodytes into new "European-style" houses, considering the old cave dwellings unsafe and unfit to live in. It is true that in certain cases some of these many centuries old dwellings feature the danger of falling rocks. But this danger endures only in a very few cases and therefore there is no need of resetteling troglodytes in general. The new houses, expensively built of concrete and red pantile gable roofes are, even being subsidized by the government, unpractical and dysfunctional in many aspects.

They are not at all compatible with the internalized room conceptions of the former troglodytes, who had been farmers for centuries. The central planners from the government did not take into account any storage space for agricultural goods. Further on the new houses don't have courtyards which play a major role in the women's life. But also many other traditional aspects and taboos had been disregarded by the planners and designers. Last

but not least the houses are completely uneconomical: they are hot and humid in summer and cold and very costly to heat in winter.

As we can see, most of the former troglodytes try to help themselves by reacting in a traditional manner in order to solve the new habitual problems. They are building annexes and new rooms in the traditional local vernacular style next to the concrete buildings. But on the other side they are also influenced by the modern western world. So some of them break with the traditional life based on subsistence economy and are now dependend on jobs outside, mostly on tourism.

The Cappadocian example once again shows very clearly that settlements, even if palnnd and built centrally, should very carefully consider the local ecological, economic and cultural needs, as well as resources into consideration. New architectural elements and the needs of modern life should be combined with the local building styles. In Cappadocia, where even the western tourists enjoy the cave dwelling culture by preferring pensions build inside the tuffa, there will be a good chance of revalorizing this extraordinary and functional housing type by building new tuffa caves combined with modern technical elements which symbolize prestiguos values.

Reference Notes

This paper is partially based on a Ph.D. dissertation "Wohnen in den Höhlen von Göreme" (Living in the caves of Cappadocia), submitted in 1989 by the author to the Faculty of Orientalism and Archaeological Science - Institute of Ethnology at the University of Heidelberg / Germany. It was supervised by Prof. K. Jettmar and Prof. U. Johansen.

In doing my studies on Cappadocia, I had been influenced by many works not cited in the following notes, like those of C. Alexander, P. Bourdieu, E.T. Hall, S. Low, P. Oliver, L. Prussin, A. Rapoport, to mention just a few.

ⁱ For a detailed discussion of the present cave dwellings in Cappadocia and regional bibliographical notes see:

Andus Emge, *Wohnen in den Höhlen von Göreme; Traditionelle Bauweise und Symbolik in Zentralanatolien*, (Berlin: Dietrich Reimer, 1990)

Paul Oliver, *The Cones of Cappadocia*, in: SHELTER, ed., Kahn, Lloyd, (Bollinas: California, Shelter Publications, 1973) p. 98 - 100

Suhan Ozkan and Selahattin Onur, "Another Thick Wall Pattern", in Paul Oliver, ed., *Shelter, Sign and Symbol* (London: Barrie and Jenkins, 1975); Woodstock, New York, The Overlook Press, 1977, p. 95 - 106

ⁱⁱ Anton Bammer, *Wohnen im Vergänglichem: Traditionelle Wohnformen in der Türkei und in Griechenland* (Graz/Austria: Akademische Druck- u. Verlagsanstalt, 1982), p.118

ⁱⁱⁱ J. Warner, *The Megaron and Absidial House in Early Bronze Age in Western Anatolia* (New Evidence from Karatas; AJA 83, 1979) p. 133

^{iv} Hassan Fathy, *Natural Energy and Vernacular Architecture; Principles and Examples with Reference to Hot Arid Climates*. (Chicago: University Press, 1986) p. 44 & 83

^v Eyup Asim Kömürcüoğlu, *Das Alttürkische Wohnhaus* (Wiesbaden: O. Harrassowitz, 1966) pp 25-26

^{vi} Önder Küçükerman, *Turkish House in Search of Spatial Identity* (Istanbul: Turkish Touring and Automobile Association, 1985) p.69

^{vii} Torvald Faegre, *Tents; Architecture of the Nomads* (New York: Doubleday Anchor Books, 1979) p. 97