Ghadban Shadi

The Architecture of the Palestinian Dry-Stone Hut
Al-mantarah

Abstract
This paper discusses the case of the architectural form of the Palestinian dry-stone hut (Arabic, al-mantarah) within the larger framework of the historical development of the dry-stone hut form across the Mediterranean region, Europe and Africa. The current status of these huts is alarming because of several factors, including the rapid modernisation of the Palestinian community, the largely unorganised urban expansion observed in the area, the lack of public awareness, the declining importance of agricultural activity in the Palestinian society and, of course, the continuing Arab-Israeli conflict. As a result, the many agricultural huts in this area have been abandoned and destroyed over the past few decades.

Thus, this paper will analyse the characteristics and importance of this type of structure, particularly the Palestinian case, through a review of the literature in this field and site visits to observe and document various dry-stone huts and to conduct interviews with a number of people. Areas of focus include the importance of al-mantarah and its role in Palestinian agricultural development and the culture generally; its architectural structure, patterns and types; and the materials and techniques of its construction. Furthermore, the paper illustrates the current status and condition of the surviving huts and concludes with a discussion of the future challenges and potentials of their preservation and development.

Keywords: Al-mantarah, dry-stone hut, corbelled stone construction, Mediterranean architecture, Palestinian traditional architecture.

Inhalt:
In diesem Beitrag wird die Architektur der palästinensischen Trockenmauerwerk-Hütten (arabisch: al-mantarah) behandelt. Hierbei wird die historische Entwicklung dieser Hütten betrachtet, die im gesamten mediterranen Raum zwischen Afrika und Europa zu finden sind. Im Fall der palästinensischen Trockenmauerwerkshütten ist der Zustand aus verschiedenen Gründen alarmierend. Die Gründe dafür sind einmal in der rapide Modernisierung der palästinensischen Gesellschaft zu finden, aber auch in der weitgehend unorganisierten urbanen Expansion, die zu einem Verfall der alten Bautradition führt. Hinzu kommen ein mangelndes Bewußtsein in der Öffentlichkeit über die Bedeutung dieser Bautradition, ein Rückgang der landwirtschaftlichen Produktion (mit dieser ist die Trockenbauhütte untrennbar verbunden), und nicht zuletzt der anhaltende arabisch-israelische Konflikt. Aus diesen Gründen wurden viele Hütten verlassen und in der Folge verfallen diese alten Strukturen.


Schlagworte: Al-mantarah, Trockensteinmauerwerkshütten, Kragsteinkonstruktion, mediterrane Architektur, palästinensische traditionelle Architektur.
Introduction

Historical Palestine enjoys a rich diversity of architectural features spread across its landscape. These man-made elements employ a variety of building materials, with stone certainly being the oldest and most widespread. As part of the Mediterranean region, Palestine has an abundance of dry-stone constructions, mainly houses, corbelled huts and agricultural terrace walls. These constructions have long dotted the terrain and traced the contours of the central mountainous region that forms the heart of the West Bank, extending from Ramallah to Hebron. Therefore, these structures are excellent examples of the traditional local architecture, reflecting a now largely lost way of life and conveying a sense of the day-to-day activities associated with this area.

The Palestinian al-mantarah is a traditional dry-stone hut that has developed architecturally over time to accommodate the farmer and his family. This form of traditional architecture is distributed throughout the entire Palestinian landscape and follows closely the form of traditional Mediterranean architecture, which is a product of the larger cultural development along the eastern shore of the Mediterranean basin caused by the historical events that repeatedly produced widespread dislocation and mixing of ethnic groups. One result has been diverse populations – with different governing systems, customs and other cultural traditions – living in proximity. Thus, the necessary conditions were established for mutual influence to take place during the process of the formation, development and enrichment of inventive traditions and values (Ghadban, 2008). Al-mantarah is a product of this mutual influence and is considered a principal component of the complete model of Palestinian dry-stone architecture, which consists mainly of peasant houses, corbelled-stone huts, terrace walls and agricultural terraces (Fig 1).

Although the consequences of the Arab-Israeli war in 1948 (i.e., the division of Mandate Palestine and the establishment of Israel), al-mantarah structures were still frequently occupied and were well used by their owners. However, since that time, the situation has changed, with many lands being abandoned because of political and socio-economic forces, and thus the importance of agriculture as the key economic resource of Palestinian society began to decline. Many Palestinians were expelled from their lands and left to face a precarious present and an even more uncertain future. Despite their importance, these structures have not received the attention and consideration they deserve. Thus, the aim of this research is to study the current situation of dry-stone huts in the Mediterranean context; to discuss the role of these structures in the development of local agriculture in Palestine; to show their present status and conditions; to identify and describe their characteristics in terms of zoning, typology, structure, architecture and methods and techniques of construction; to assess the value these traditional huts hold in terms of cultural heritage; and to identify what measures are needed to the ensure their preservation and development. Therefore, the methodology implemented in this study included site visits, especially in the mountains around Ramallah, Bethlehem and Hebron, to observe and document several dry-stone huts in these areas. In addition, interviews were conducted with a number of people, both old and young, to elicit their experiences with these structures. For this study, the development of the Palestinian dry-stone huts model in a Mediterranean context was examined through surveys of the literature related to the historical and ethnographic development of al-mantarah and the few studies available on traditional Palestinian architecture (Arraf, 1985; Hamdan, 1996; 'Amiry & Rahhal; 2003 and Ghadban, 2008) and on dry-stone huts specifically (Ron, 1977 and Houdalieh and Ghadban, 2012). Finally, the architecture of the Palestinian dry-stone hut is analysed in terms of spatial organisation, location, socio-cultural aspects, construction forms, materials, techniques and proportions.

Several constraints arose during the study, including the lack of coherent documentation of the locations of the huts, the risk of collapse of several structures caused by their severe deteriorating condition and the absence of people with direct visual contact with the entire process of the building of these structures.

Dry-Stone Huts throughout the Mediterranean Region

The traditional vernacular architecture of a region evolves over time to reflect its environmental, cultural and historical context. Such architecture is constantly shaped by the traditions and customs of peoples and nations, and it thus reveals their ways of living and their values because all forms of traditional architecture are created to meet specific needs of the population (Holm, 2006). Dry-stone huts were an especially common form of this traditional vernacular architecture.
especially throughout the Mediterranean basin (Fig 2).

Because of the quantities of natural limestone available in the Mediterranean countries, and the desirable physical and aesthetic characteristics of this material, the local peoples used it widely to construct dwellings, terrace walls, fences and monuments. A review of what is known as dry-stone huts – their history, development, functions, forms and construction – enables a better understanding of how this structure relates to the traditional stone huts found in other lands and cultures. Regardless of whether they are demonstrably Mediterranean in origin, these traditional structures are a result of complex mental processes, shaped by the available knowledge and the everyday needs of people, and thus embody much of those who built them. Moreover, these structures have been shown to be a key architectural form that reflects the earliest modes of the thinking of local ancestors and their way of life.

Initially, shepherds and peasants constructed these huts on the agricultural terraces that followed the contours of the mountains and valleys (Fedele, 1965). These structures, which had corbelled roofs, originated mainly in the near eastern portion of the Mediterranean basin, most likely at the beginning of the Early Bronze Age (2300-1600 BCE). A dry-stone hut consists of an evolved circular or quadrilateral arrangement of space. These huts were either built as freestanding structures or linked to the stone terrace walls that bordered the fields (Walton, 1962). Scattered throughout the Mediterranean countries, these structures are often called “corbelled stone huts”. However, the name “farmers’ shelters” is also used, and other scholars identify them as simply “huts”; some countries have with their own traditional names, such as the “beehive hut” of South Africa, the “Girna” of Malta, the “Cabane” of France, the “Trullo” in Puglia/Italy, the “Mitata” in Crete/Greece and “al-mantarah”, which is the Arabic term used in Palestine (Juvanec, 2001). These huts are also documented in Spain, Croatia, Catalonia, Tunisia, Southern Turkey and Sardinia (Cassar, 1961).

Dry-stone huts had more than one function (Juvanec, 1998). Their primary function was as a shelter that provided a cool, shaded place for the peasant or field worker and protected the occupants from wind, rain, sun, cold, heat and enemies. Huts were used as shelters away from home, never as sheds, pigsties or hen houses (Horvatic, 1999). The construction of huts for purposes of protection was a typical function in most of the Mediterranean countries. Huts were also used for hunting; for example, bird hunters used to shield themselves within unroofed circular structures to observe and hunt birds in the surrounding area, as in Malta and Catalunya. Watching was another important function of huts, especially in Palestine, Spain and Malta; thus, they were located on elevated sites with a view overlooking the nearby pasture and agricultural areas (Lassure, 2000). Likewise, corbelled huts were also used for defence in Scotland and Ireland and for storing crops, especially grains, in South Africa and many other countries (Juvanec, 2001).

The distribution of these huts extended beyond the Mediterranean region to Ireland, England and even countries in southern Africa. Walton (1951) reviewed two well-defined routes for this spread, both emanating from the Mediterranean. The first route traces the spread of corbelled huts from Italy westward through Sardinia, the Balearic Islands, Spain and Portugal, then to Western England, Wales and Ireland, the Scottish Isles and finally to Scandinavia. The second route follows an easterly direction, by which this style spread to Greece and then southwards, ultimately reaching Orange Free State (as the area was then known) in South Africa. The route of the huts’ spread to South Africa was no more than a hypothesis until examples of the beehive huts typical of the area are discovered in Ethiopia and Sudan at the beginning of the twentieth century.

Walton (1951) defined three distinct types of huts (Fig 3).

Type (A) was the simplest type and was built from rocks of spheroidal dolerite or from rough blocks of sandstone; b) the type that arose as a response to the need for a larger living space inside the hut; and c) the type in which one axis was extended to produce an oval shape.

Fig. 2: Names and distribution of dry-stone huts throughout the Mediterranean region. Barraca and Pont, Spain; Cabane, France; Crot and Scile, Switzerland; Hiska, Slovenia; Karun, Croatia; Trullo, Italy; Girna, Malta; Pinettu, Sardinia; and al-mantarah, Palestine.

Fig. 3: The three distinct types of stone huts defined by Walton: a) the simplest type, which was built from rocks of spheroidal dolerite or from rough blocks of sandstone; b) the type that arose as a response to the need for a larger living space inside the hut; and c) the type in which one axis was extended to produce an oval shape.
represented by Scottish and Irish examples. Type (B) arose as a response to the need for a larger living space inside the hut. Using an improved building technique, the builders succeeded in increasing the height and diameter of this hut to reach 150 cm in height and 200 cm in diameter. In the Type (C) hut, one axis of the hut was extended to produce an oval shape, thus further enlarging the interior space.

Dry-stone huts were constructed using a dry-stone corbelling technique without the use of materials to bind the stones together. Using patterns from four different European sites, Juvanec (2003) discussed four possible methods for such construction. He concluded that corbelled constructions consist of five elements: the outer wall, the revetment wall, the corbelled vault, the infill material and the keystone. The first possible method is that used in the trullo near Alberobello, Puglia, in Italy. In this case, the corbeling starts at shoulder height above the revetment walls. The roof is constructed of two layers of large stone slabs with some infilling material that can be found between the corbeling and the cladding of the roof (Fig 4a).

The second method is used in Pagliaddiu at Santu Pietru in Corsica and in France and Palestine. In this method, the corbeling starts at shoulder height of the vertical revetment and then diverges from the outer wall instead of running parallel to it. The roof is covered with a large stone slab, and the entire roof may be covered with earth and grass (Fig 4b). The third method is represented by the girna in Mistra Valley, Malta. According to Juvanec, the typical girna boasts a perfect corbelled vault and a nearly vertical outer wall and has a height of approximately 2.2 m. The vault is covered by a large stone slab (keystone) and some infill material between the corbeling and the outer surface (Fig 4c). The last method is observed in Bambo, near Tomelloso in central Spain, and consists of vertical outer walls and an inner revetment, and the vault has a typical corbeling, with stone rubble used as infill (Fig 4d).

Furthermore, Juvanec (1998) delineated a framework of geometrical proportions and scales to which the stone constructions conform. The corbeling of the hut is laid out with two basic circles forming the inner and outer lines of the ground plan. In the cross section formed at the inclination of the walls from base to apex appears an equilateral triangle. Moreover, so-called "golden section" proportions were observed in the stone constructions. In terms of their height and internal space, the huts are designed for human use, and thus they are made according to the scale and dimensions of the human body. Because the human body in turn reflects the proportions of the "golden section", these same proportions are found in the hut constructions. Indeed, this system of proportions is observed in all aspects of the stone huts' design – in the sections, plans and elevations – and thus is explicitly reflected in their construction.

Analysis of the Palestinian Dry-Stone Hut (Al-Mantarah)

The Palestinian al-mantarah shares various qualities of the Mediterranean stone huts and is considered to be among the most interesting Palestinian architectural forms. The al-mantarah type of hut presents a unique symbol of people’s relationship with the landscape, their need for grazing lands and clear fertile fields, their rituals of agriculture and how they observe the passing of the seasons. In addition to the local term used for these structures, al-mantarah (plural al-manateer), in some parts of Palestine, the terms al-mantar (plural al-manateer) or al-qaser (plural al-qusoor, farmers’ palaces) are also used. The fieldwork conducted for this study recognised that in addition to their geography, corbelled dry-stone huts can also be analysed according to their history, associated socio-economic life, spatial zoning, materials and construction, and their decline.

1- Geography: Dry-stone huts (al-manateer) are situated as follows: on the summits of mountains, at intermediate levels on the slopes of hills and in flat areas in valleys. Moreover, their distribution is not uniform throughout the area. Their placement reflects, first, differences in the sizes of various parcels of land, with each property, regardless of its size, usually containing a single hut. Thus, the distances between the huts reflect to a large extent the size of the individual properties. Placement of the huts was also affected by the necessity to define the proper site and to choose a suitable environment for allocating these structures; for example, the placement of huts parallel to the contour lines of the slope towards the valley situates their face toward the direction of the prevailing wind, which ensures the desired ventilation. In addition, issues of ownership, protection from various natural and man-made threats, proximity to a watercourse and the desire for social contact with neighbours versus the value of privacy were major motivations behind the siting of huts. Thus, this careful placement affected the distribution and density of dry-stone huts throughout the mountainous region of the Palestinian territories. Placement was influenced by several additional factors, such as:

1:1- safeguarding fruit and other crops,
1:2- distance from the living place to the agricultural field,
1:3- availability of sufficient quantities of stone,
1:4- the agro-climate and bio-climate necessary for the production cycle in each area, and
1:5- the socio-economical factor that emerged from the increasing number of the people
working in the agricultural sector because of the consecutive division of properties among the owners. This factor provoked awareness about agriculture and increased the areas devoted to fruit and other crops, which by default led to an increase in the number of dry-stone huts, built to satisfy the needs of the new owners.

2- History: The first stone constructions discovered in Palestine were built by the Kebarian and Natufian cultures during the Epipaleolithic period. According to Callaway (1963:76), a village of circular huts with stone foundations was built at the settlement of E’in-Mallaha (Eynan) in the north of Palestine, and these dated to 8000 BCE. In addition, the inhabitants of this village buried their dead in circular stone structures similar to the houses in which they lived. Those primitive burials represented a type of dwelling for the deceased, one that held all of his needs, protected his body from wild animals and identified his resting place because death was viewed as a process of transition to another life.

Thus, it is believed that corbelled stone huts originated from those burial structures. However, still there is no concrete evidence regarding exactly when such structures first appeared. It is likely that their appearance coincided with the beginning of settled agriculture, which occurred several thousand years before the present. Modern archaeological and survey work throughout Palestine (PEC DAR, 1994) has documented that many huts are located in areas with specific archaeological sites, such as is the case in Ain-Qinia village near the city of Ramallah and at Al-Makhrour Mountain near the city of Beit Jala. A few of the many agricultural huts are presumed to have existed from late prehistory into the early historical periods (ninth to fourth millennium BCE); however, the absence of these hypothetical constructions would a result of the repeated heavy use of the land throughout antiquity, in addition to natural forces such as earthquakes and the decay or weathering away of organic building materials. During its historical development, al-mantarah has been found in several forms, all similar in function. It has been noted that the form of these huts varies according to the area. Three main forms were popular in the Palestinian territories:

2:1- In the lowland areas, temporary wooden constructions called Pergola (Arabic: areesh or Areesh) in the lowlands, and b) Corbelled dry-stone heap and c) Corbelled dry-stone hut, both in the mountainous area.

2:2- Heaps, the earliest round structures, have a simple form composed of stones of various sizes that were primarily gathered from the site in the course of preparing the land for cultivation and stacked in hillocks (Arabic: rojoum; Fig 5b); and

2:3- The corbelled dry-stone hut (Fig 4c), which is assumed to be the most popular version of these structures and is common throughout the mountains of Palestine, is similar to hut structures in some other Mediterranean areas such as Malta, Spain, France and Southern Italy. Although this simple form was common in most mountainous regions (Fig 6a),

some more sophisticated forms of this hut have been found. In some cases, two or three structures were attached to create a sophisticated al-mantarah (Fig 6b), known as a manor (e’zbah or seerah). Such forms were popular among the wealthy families of Jerusalem and Hebron. Other, more sophisticated circular forms with more rooms and storeys have been found in the Bethlehem region (Fig 6c).

They are more complex in terms of structure and characterised by more concentration on architectural details, and some are surrounded by curved enclosure walls and have multiple
staircases connecting their spaces. Moreover, a conical-shaped dry-stone hut is also common, with a single large room, a conical corbelled dome inside and a flat roof accessed through an internal staircase that is used for various activities (Fig 7).

3- Socio-economic life: Ron (1976) indicated that in 1974 the West Bank of Palestine contained 7,715 huts distributed over an area of 412.5 km², with a density of 18.7 huts per km². He claimed that in 1945, the total number of the huts was 5499 distributed over an area of 103.9 km² of the agricultural land, which is a density of 52.9 huts per km². These statistics show that in the past, al-mantarah – beyond its undeniable rustic charm – played a key role in supporting the Palestinian culture and economy that was closely related to agriculture. For centuries, agriculture was the most common day-to-day activity and the one that the local inhabitants depended on most heavily as the basis of their economy (A’rraf, 1985). For example, stone was abundant in the mountainous areas, and land must be cleared before cultivation can take place. This work itself required farmers to construct terrace walls following the contours of the hills and mountains to provide suitable level areas for planting and to allow maximum rainwater to penetrate the soil, thus preventing soil erosion and making more moisture available to their crops. In addition, farmers used the available stone material to construct permanent residences on their land, which were occupied during the various working seasons and ultimately became a trademark of traditional Palestinian architecture (Fig 6).

Apparently, al-mantarah was associated with the yearly agricultural cycle in both the plains and the mountains because of the need to watch and protect the cultivated land against animals and thieves. These huts also provided a nearby convenient place for producing and storing crops, usually on the ground-floor level of the hut, until they could be transported or processed. The convenience of the huts also enhanced the quality of certain agricultural products because they could be handled on the site. For example, presses were established close to al-mantarah, allowing farmers to process their olives and grapes in a timely fashion. Other fruits were spread across al-mantarah yard areas or on the tops of the roofs to dry as a method of preservation and then stored inside. The internal environment of al-mantarah was conducive to such storage because the inside/outside temperature differential of these structures ranged between 8°C and 15°C, depending on the time of day (Ron, 1976:76).

Thus, al-mantarah facilitated the processing of certain crops, such as drying grapes to make raisins, preserving figs, crushing and pressing olives into oil and the pressing of grapes into juice, dibs (a thick fruit syrup) or wine (which was common in the Jerusalem, Bethlehem and Ramallah regions, where grapes grew in abundance and the majority of the population was Christian). Afterward, the stored crops or finished products were transported for trade or domestic use.

In addition to its economic aspects, al-mantarah also played an important role in the social life of Palestinians in earlier times. It was a place for the celebration of the seasons, where families met to assist one another in the attendant tasks: ploughing, planting, harvesting and the processing of crops. In this setting, families would gather in the evenings to eat, talk and sing. Moreover, al-mantarah was crucial for maintaining the security of the land. With or without the farmer present and actively watching over his land, the existence of the stone huts always signified ownership of the land and therefore discouraged entry by strangers or the stealing of crops. Finally, al-mantarah demonstrated a pragmatic and effective use of the abundant stones collected during the preparation of the land for agriculture.

4- Spatial zoning: A private agricultural plot was divided conceptually into two primary zones: the agricultural fields, where planting took place, and the zone of al-mantarah and its immediate surroundings. As a result, the zone of al-mantarah, which also accommodated the
living and working activities of the farmer, was generally located on an appropriate elevated spot overlooking the fields, normally on a rocky platform (Fig 5c), to facilitate construction and also to avoid intruding on fertile land. The total area of al-mantarah and, including all of its various facilities, was approximately 500 m² (Hamdan, 1996: 436). Moreover, the hut was essentially located in the middle of the fields and close to the fruit-bearing trees to facilitate the collecting and storing of the crops. In other cases, al-mantarah was located near a road to facilitate the transporting of crops and products to home or market.

After the site for al-mantarah had been defined, the surrounding area was divided into the necessary external function zones, the so-called yard (or multiple yards on different levels), which surrounded al-mantarah. Within these spaces, farm tasks such as sorting and drying fruits were performed, and the animals were sheltered. Other important facilities were also attached to al-mantarah yard, such as a kitchen, the taboon (the traditional Palestinian-Arabic term used to describe the oven, which was usually constructed from clay and located in the yard of the traditional peasant house and used for a wide variety of cooking and baking purposes), a water cistern, rock-hewn marks, a fireplace and the basic installations of a wine or olive press (Fig 8).

It has been observed that in the majority of cases, all of these elements were situated at the northeastern or southeastern side of the hut, for strictly environmental reasons such as protection from the western and northwestern winds, provision of afternoon shade and morning sunshine, and oriented toward the main entrance of the hut. Once the hut site was identified and laid out, the building materials were gathered, the site cleared and the foundations of the various elements marked out.

Materials and construction: The materials used for the construction of corbelled dry-stone huts include unworked fieldstone, boulders and mortar, a mixture of earth with lime, ash, gravel and grog), plaster and wood. In principle, the building materials used depended on the intended style and shape of the hut and the financial means of the owner. The construction of the huts lasted from several months to more than a year, depending on the manpower and the time available to invest in the construction. Peasants would usually collaborate in building the huts in which case the owner provided the helpers with food and drink during the course of the work. Sometimes, however, the volunteer labourers brought their food with them to minimise the cost of the project to the owner. In instances in which the owner opted to pay for the labour, especially for the master-builder, the cost of construction could be considerable. The owner might pay either in cash or in kind, i.e., with a certain quantity of cereal-grain, olive oil, sheep or goats.

The corbelled dry-stone hut was constructed according to the dry-stone construction technique observed throughout the Mediterranean basin (Fig 4). Generally, rough, unworked fieldstone, with irregular and polygonal forms and without any bonding material, was used in this process. The discussions conducted in several regions indicated that the quantity of stone required for construction of the round huts and solid stone heaps was gathered from the areas near the structure. If the owner failed to collect enough stones for the new construction, he would quarry the surrounding bedrock, using thick, pointed iron bars (nukhul), chisels and heavy hammers, to produce the needed quantity.

The construction of these huts is composed of two adjacent walls of stone: an outer wall and an internal wall (revetment). After the building site was cleared and sometimes levelled, the round plan of the construction was usually marked by forming two concentric rings of earth 1 to 1.5 m apart, with the area of the room ranging from 10 to 15 m² (A’miri and Rahhal, 2003: 42) and taking into account the placement and dimensions of the entrance. Next, a bottom course of large stones was laid on top of each of the two earthen rings, thus outlining the inner and outer faces of the hut’s foundation. Then, the space between the two rings of large stones was filled with medium and small-size stones mixed with earth and other debris, all collected from the adjacent area. With this technique, it is difficult to speak about “courses” of laid stone because the stones are unworked and irregular in shape, making it difficult to lay them in regular, horizontal courses or layers. Instead, they are simply fitted together according to their natural shape but with the stones of the lower parts generally of larger size than those of the upper for both static and stability reasons. The simplest version of this corbelled dry-stone hut has no roof and consists only of a space enclosed by a circular dry-stone wall approximately 2 m high; this version was most common in the Hebron area. In the more sophisticated version, a slight inward slant was introduced to the outer face of the wall as the wall proceeded up toward the ground-floor roof level, providing more stability and gradually minimising the weight of the structure. The internal faces of the same walls likewise incline gradually toward the centre, beginning at approximately 0.8 to 1.0 m above the floor level and ultimately forming a vaulted (or domed) ceiling, which ordinarily has the
The finished ceiling appears vaulted from inside, but most of the exposed roof area is levelled, which allows the roof to be used for drying agricultural crops, watching the fields and sleeping. It was common to cover the roof with a pergola made of tree branches to provide shade during the day. Once the ground floor is completed and roofed, this procedure is repeated upward in the same manner until the huts reaches the overall height and the desired number of floors, usually one or two. Regular dressed stones – shaped by hand – are used to frame the window and door openings. The different floors are connected by stairs, either interior or exterior. The ground floor appears as one large, vaulted room, which would accommodate the varied activities of the family. This room is accessed through a small rectangular doorway with common dimensions of 80 x 180 cm, usually in the eastern or southeastern façade. In some cases, however, the door is arched. Windows rarely are found in this room, and any windows are small openings at the western side or above the door intended for ventilation, in addition to a possible location of another window opening towards the valley or the main road leading to the hut, intended for observation and watching. Non-penetrating openings, or niches, are often found in the interior walls, and these were used for storage or for placement of simple lighting fixtures such as open wicked lamps or lanterns. This room was multi-functional in every sense, used for activities such as sleeping and storing crops. Containers of dried figs, for example, were buried in the floor of this room to preserve them for later use, and the significantly cooler indoor environment (Ron, 1977: 77) lent itself to this use, especially during the summer months when outside temperatures could be as high as 28°C and it might be as cool as 14°C inside al-mantarah. Al-mantarah was always surmounted by external stairs, connecting all of the yard levels with the entrance of the hut. The system of proportions has also been analysed in the typical initial form of hut construction. The example here is from Al-Mazra’a village to the northeast of Ramallah city, and its dimensions are similar to those of other huts known in this area. The main conclusions of this analysis are that the equilateral triangle, with three sides of equal length and three 60-degree angles, is evident (internally) in the cross section (Fig 10a) and the “golden section” proportions are also found (externally) in the section of the hut (Fig 10b).

The results of this analysis would seem to confirm the system of proportions in huts found in different Mediterranean countries (Juvanec, 1998). Taken together, these findings indicate the conformity and harmony in terms of the proportions and construction of such huts throughout the larger region. These qualities are perceptible, especially in the visual and spatial aspects of these huts, which suggest a single, common language running through the traditional architecture of the Mediterranean region.

**Decline of the role of al-mantarah:**

The fieldwork and the interviews conducted demonstrate that the younger generations are no longer aware of the presence of these huts throughout the Palestinian landscape, let alone their cultural significance. Most of the dry-stone structures in the West Bank of Palestine today are unoccupied, many are damaged and in some places they have been totally destroyed. Their numbers, mainly in the regions of Hebron, Bethlehem and Ramallah, have decreased between 1945 and 1967 (Table 1). The system of proportions has also been applied and tested on similar dry-stone huts in the Judean and Samarian Hills, pp. 214-217 & 343.

<table>
<thead>
<tr>
<th>Region</th>
<th>Hebron area</th>
<th>Bethlehem area</th>
<th>Ramallah area</th>
<th>Total average</th>
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<td>Number of huts (1945)</td>
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<td>1016</td>
<td>2004</td>
<td>6643</td>
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<tr>
<td>Number of huts (1967)</td>
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<td>1618</td>
<td>5168</td>
</tr>
<tr>
<td>Decrease in number of huts (percent), 1945 to 1967</td>
<td>30%</td>
<td>2%</td>
<td>19%</td>
<td>22%</td>
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</table>

Table 1: Number of huts in the main mountainous areas in Palestine in the years 1945 and 1967. Author, based on Ron (1976), Stone Huts in the Judea and Samarian Hills, pp. 214-217 & 343.
the average share of huts per family in these areas was mostly constant during the same period, the total average being 0.8 hut per family (Tables 2 & 3).

Table 2

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of huts (1945)</th>
<th>Number of families (1945)</th>
<th>Number of huts per family (1945)</th>
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<td>Area</td>
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<td>Bethlehem area</td>
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<td>1.4</td>
<td>1.1</td>
</tr>
</tbody>
</table>

Table 3

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of huts (1967)</th>
<th>Number of families (1967)</th>
<th>Number of huts per family (1967)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>Hebron area</td>
<td>Bethlehem area</td>
<td>Ramallah area</td>
</tr>
<tr>
<td>Hebron</td>
<td>3623</td>
<td>1016</td>
<td>2004</td>
</tr>
<tr>
<td>Bethlehem</td>
<td>5358</td>
<td>750</td>
<td>1867</td>
</tr>
<tr>
<td>Ramallah</td>
<td>0.7</td>
<td>1.4</td>
<td>1.1</td>
</tr>
</tbody>
</table>

Several factors played major roles in the decline of the importance of these huts in Palestinian society during the second half of the twentieth century. These factors include the Israeli occupation of the West Bank and the Gaza Strip by Israel in 1967, the new local labour market in Israel and the emigration of a significant number of the younger population. Moreover, the continuing education abroad or to the Arab Gulf countries in search of work opportunities. Just as traditional agricultural practices were disappearing from the lives of the Palestinian villagers, did the importance of such structures, and the attention paid to them, was also diminishing. Many agricultural lands, along with their distinctive, traditional dry-stone structures, were left abandoned and vulnerable. However, several factors will continue to influence the current status of dry-stone huts. These factors include the continuing Israeli policy of confiscating large areas of Palestinian agricultural land and, especially, expanding the settlement activities and building the separation wall; the ongoing Israeli policy of maintaining Palestine’s dependency on the Israeli economy; the declining importance of agricultural activity; the involvement of more Palestinian people, including farmers, in administrative and governmental jobs; the continuing rapid and largely sprawling urban expansion that consumes agricultural land; and the introduction of a new culture in addition to the existing local one that contributes to the destruction of traditional structures in the area.

Conclusions

The Palestinian al-mantarah provides an excellent example of traditional architecture. Thus, it reflects a former way of life in Palestine, conveying a sense of the simple, rural settings and activities that were such important parts of traditional local culture. The dry-stone hut was, and remains, an ideal expression of a specific cultural heritage. Possessing a genuinely iconic quality within the Palestinian landscape, the huts effectively symbolise the distinctive flavour of that once-vibrant rural society and, indeed, embody a host of social, economic, architectural, aesthetic and symbolic meanings and values. The form of the Palestinian al-mantarah is utterly natural, for, although it is a product of human labour, it harmonises perfectly with the environment. Built on a human scale, the hut does not intrude upon the landscape. Indeed, it is often difficult to distinguish al-mantarah from the stony mountains and terrace lands on which they stand.

The analysis of this indigenous structure has shown that the construction of al-mantarah was directly related to the development of agriculture and the annual cycle of agricultural seasons. Thus, just as the importance of agricultural practice is vanishing from the daily life of modern Palestinian villagers, so is the importance of such constructions and the attention people pay to them. In the present day, most al-manateer are abandoned, and any appreciation of their previously important role in traditional Palestinian life has been lost. With public and private transportation becoming faster and easier, farmers typically travel to their land in the morning and return to their homes in the evening. Transporting and processing crops are also becoming easier and more efficient through the use of modern techniques. All of this has contributed to a decline in the importance of al-mantarah in all of its previous functions: as a hut, as seasonal lodging and as a place for the storage and processing of agricultural products.

Therefore, it is essential to continue to document and study these cultural landscape structures and to raise awareness among the general public about their significance and value. First, the Palestinian Authority must list al-manateer among the significant local cultural heritage features that are mandated to be maintained and preserved because these huts truly are a fundamental component of the Palestinian cultural heritage and landscape. Furthermore, complete restoration is needed for exemplary types to preserve their integrity within the physical landscape and to reintegrate these huts into the remembered cultural landscape of Palestine. This will encourage the re-use of these structures for various modern functions such as tourism, education and agricultural festivals. However, this issue requires thorough discussion at the national level to define the potential aspects of re-use and restoration.

Finally, the author hopes that the outcomes of this study will stimulate the development of further in-depth research that might address the more recent Al-mantarrah types, which are found in other parts of Palestine, with well-cut and sometimes well-dressed ashlar stone, laid in regular, horizontal courses. This additional understanding might allow the establishment of a clearer distinction between traditional dry-stone huts and those believed to be later inventions.
Al-mantarah: Die Architektur der palästinensischen Trockenmauerwerk-Hütten

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Literature:


Ron, Z. Y. D. (1977). Stone Huts as an Expression of Terrace Agriculture in the Judea and Samarian Hills, Tel Aviv University, Department of Geography. [In Hebrew]


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Fig. 2 based on Juvanec, B., 1998
Fig. 3 based on sketches prepared by Juvanec (2003)
Fig. 4 based on sketches prepared by Juvanec (2003)

Table 1 based on Ron (1976), Stone Huts in the Judea and Samarian Hills, pp. 214-217 & 343
Table 2 based on Ron (1976), Stone Huts in the Judea and Samarian Hills, pp. 214-217 & 343
Table 3 based on Ron (1976), Stone Huts in the Judea and Samarian Hills, pp. 214-217 & 343