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THE ROCK DWELLINGS OF SHAWBAK AND NEARBY AREA (Southern Jordan)

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ABSTRACT

As part of the archaeological mission “From Petra to Shawbak – Archaeology of a Frontier”, specific research was addressed to the identification and study of artificial hypogea that develop on the extensive cliffs around the crusader castle of Shawbak, located in southern Jordan. The structures known as Jaya and Habis, positioned in the immediate vicinity of the fortification and related to it, are of particular interest. Above all, some of these settlements may have been part of the Ayyubid-Mameluke town already pinpointed and certainly present at some time during the 13th-14th centuries.

The original configuration of the underground environments is easily identifiable even from outside because of recent collapse, but their exploration is complex due to the fact that the sites are vertical, although it is clear that the site was settled on a continued basis. The earlier phases, presumably Byzantine and revealing its use as a place of worship with burials and simple depictions, were followed by agricultural periods, with definitive interruption presumably only in the last century.

The examination of the sites included not only surveys but also hydro-geological readings, radon gas sampling and landscape-settlement analysis.

These multidisciplinary studies intend both to safeguard the cultural identity of the sites and to foster the most suitable technical and scientific activities for their enhancement and promotion in the tourism sector.

PREFACE

Between 2006 and 2010 five expeditions were made in Jordan which led to the discovery and exploration of a large gallery situated within Shawbak castle, a fort dating from the time of the crusades, of a second gallery whose utilization is uncertain and of a third one which is currently inaccessible and whose utilization has not been identified yet. In the hills and nearby areas searches and survey activities were also conducted on some underground or cave structures, used as living spaces or for religious practices, situated near the castle and probably connected to it, on two rock settlements - Jaya and Habis - situated in two neighbouring separate areas. Moreover a specific survey was conducted on the two qanats situated in areas close to the village of Udhruh and the town of Ma'an.

The purpose of these searches is to show the link between the rock/defensive settlements and the use of the water sources in accordance with the objectives of the *qanatproject*¹. The qanat

project conducted survey activities and inspected also many other qanats that were found in the area and that certainly had had, till the recent past, a great strategic importance since they represented the primary sources of water supply along the ancient roads going towards the desert. Hydro-geological data were collected in the area, radon gas measurements were recorded and a landscaping and geomorphologic analysis were made. With the exception of the qanats, which were very badly preserved, all structures and settlements were located, explored, studied and documented. The preliminary results of these studies are described below.

1-underground galleries and rock settlements in the Shawbak area (Ma'an district)

- Shawbak castle galleries

The first and more significant gallery is situated in the S-W sector of the castle between the first and the second circle of walls. It is devised to meet with its steeply sloping layout a natural spring called "*Ain al Ragaye*" (literally *the source of the chameleon*). The entrance, situated in the castle close to a curtain wall, leads after a few steps to a constructed gallery which, after a 180 degree turn, again turns 90 degrees toward the S-SW. The light still comes from small openings in the wall on the left while both the tread and the rise of the steps begin to have a different shape. In this sector the constructed gallery ends and the excavated gallery begins. Structural observations showed that the gallery was designed to reach, from the interior of the fortification, the source which flows at the foot of the hill. Two sections of the same length, about 60 m, and of about 2x2.5m in size were made and they were joined by a short winding part which made descent possible in a restricted space. These spiral stairs solved the problem of the upward slope and allowed servants to carry water containers. In this nodal place there are two different acute arch supports made of squared hewn stone which rest partly on the gallery's walls and which sustain low rough masonry used to accommodate the materials due to excavations and/or restoration.

The condition of the gallery is fairly good. The water of the spring was analyzed confirming that it must have flowed through carbonate rocks for medium/long periods of time. The radon concentration in the air of the gallery was measured. The radon monitor was placed almost at the end of the part with the steps and the concentration recorded was low, equal to 56 Bq/m³. All the main parameters were constant: temperature 16°C, pressure 83 kPa and humidity 30%.



Fig. 1 The gallery going from the castle to the Ain el Ragaye spring

The layout begins with a short section of about five meters directed towards NE, then it turns few degrees towards N for three more meters, after a widening it turns abruptly 90° for few meters, as if by mistake, then it goes on in the original direction for further eight meters. The front of an abandoned excavation, probably another error in direction estimation, shows a new deviation towards E for eight meters. There is then another widening and another deviation towards S, as if for another change of direction, for only three meters. The gallery turns again towards SE for ten meters and there is then a double 90° turn. The first part is only two meters long and the second part three meters; here the gallery stops with a flat front, shaped at the sides and a small moulding of few centimeters is visible. The gallery has different profiles but its height and width are constant, measuring one meter and a half and one meter. Various debris, among which a grindstone for cereals, steps roughly cut and setbacks, characterize a complex structure whose function has not been identified yet.

- Rock dwellings on Towr Aba-Ras hill

The hill called Towr Aba-Ras is a high ground facing Shawbak castle and standing in a northeastern direction. On its western slope there is a rock village (see Fig. 2) composed of four different kinds of settlement spaces: a) artificial cavities with important adaptations, even building works, used as places for religious worship; b) altered artificial cavities with adaptations and building works, used for various purposes but, in the recent period, as cattle sheds; c) raised habitations made of hewn stone, mortar and adobe; d) terraces, even very large, used for cultivation. The habitations were not used during the few last ten-year periods while the terraces, thanks to irrigation works, even recent, are partly still in use for cultivations such as those of the olive tree, grapevine, fig, pomegranate and other Mediterranean fruit trees.



Fig. 1 Some of the Towr Aba-Ras cavities and habitations

The cavities used as habitations, or more recently as cattle sheds, are not very deep, they are dug along the terraced slope of the hill and they are composed mainly of only one room whose entrance is shut by a wooden door and dry masonry. In some cases there are elements made of squared stone used both for the raised parts and for the door lintels, clearly recovered from other constructions to be used here. On the top of the hill we found a simple carved grave still hosting part of a skeleton.

- *Rock settlements on Shawbak castle hill*

On the Shawbak hill there are other settlement spaces comprising *hypogea* used as cattle sheds with outlets of dry masonry; a hypogeum used as a burial-place with remarkable substructures and adaptations; a hypogeum used as a place of worship. This latter is worth special attention because of the presence of internal canalizations designed to collect water, two *arcosolia* - of which one readapted - and the presence of two graffiti crosses on one of the door-jambs of the entrance. The whole structure, in the recent past, was certainly more complex and included other spaces; the building of a road to reach that sector of the hill caused the destruction of a substantial part of the structure; a *colombarium* and other small hollows presumably used as cisterns are still partly visible. On Shawbak castle hill there are also other twenty artificial cavities situated in different localities, the outlets of some of these cavities are closed by dry masonry, all the cavities were used as cattle sheds, at least in the recent past.

- *Habis 1 rock dwellings*

The rock dwelling *Habis 1* is situated near *Abu Maktub* village on the left bank of the *wadi* that lies below and at the foot of the hill facing the nearby castle's hill. It is characterized by the presence of three groups of cavities which today are separate from each other but which were originally joined and part of a single settlement. Progressive subsidence of the rock caused the collapse of whole sections of the cliff and consequently of some of the cavities, but in a very few of these some remaining walls can still be recognized. The whole site is structured on three levels and its cavities, though very close to each other and forming a single settlement, were differently positioned according to their utilization.



Fig. 3 Part of the third level of Habis 1 rock dwellings

Today a group of cavities used as dwelling-places, a group of cisterns and storage silos for provisions and a group of cavities used as a place of worship and burial can still be identified. Another cavity, isolated and used as a place of worship and burial, remarkable for the presence of plasters, frescoes and graffiti crosses, was found on the third level close to the group of cisterns and silos. In any case the rock dwelling is impressive for its extent and complexity. A particular care was devoted to the water collection and transport; there are several water tanks carved in the rock and some interesting water ducts connecting the tanks to the lower dwelling

levels.

The dimension and the location of *Habis 1* rock dwellings suggest us that a wide area around Shawbak Castle was quite densely populated. As a matter of fact, medieval sources report that Shawbak Valley was as fertile as the Damascus gardens and locals told us that the valley (and some of the cavities) were still lived in some decades ago.



Fig. 4 a) niche with trace of painting; b) set of dots in columns

An important finding was the discovery of ancient painting traces, in the upper border of a niche (Fig. 4.a) at the entrance of one of the caves, with a cross above. Probably the niche hosted a little statue or a religious image. Moreover there are several letters and symbols carved in the rock inside the dwellings. The strangest one (Fig. 4.b) is a set of dots in columns (a similar shape was found in *Towr Aba-Ras* too); we made two hypothesis: 1) it is a calculation system or 2) a kind of game.

- *Habis 2* rock dwellings

The *Habis 2* rock dwelling (Fig. 5) is near the village of *Al Muqariya* approximately 3,5 km ENE from Shawbak. It is along the slope of a hill, in sheer drop hydrographical left over the narrow valley coming down from the village. Nowadays the dwelling, though very big and articulated, is for a large part destroyed after the collapse of the rock face, at the bottom of which there is a sort of cone-shaped mass of rubble led to one or more important slides down. The existing site is in a vertical position on a steep incline and the rocks are partially unstable. The dwelling is articulated in five levels of rock cavities. The successive collapses covered the first and lowest level. Only some of its ceilings can be seen. Of the higher level, the fifth, there are only some traces of the back face in one of the cavities. It is possible to get to the second level only by climbing. On this level there are three different groups of very articulated cavities all communicating among themselves.



Fig. 5 The *Habis 2* rock dwelling

this 3rd level there are several carved pillars. In the last N-W cave there are two water pools carved in the rock floor. In some caves there are more recent traces of artificial walls. Other rooms on the 3rd level are separated from the central settlement and it is possible to reach them only with climbing equipment. One of these rooms is interesting: an almost rectangular cave with several niches on the walls. In this site, atmospheric conditions (temperature 21°-22°C; pressure 87 kPa; humidity 18%) and radon concentration (very low: 18 – 21 Bq/m³) measurements were performed.

The 4th level can be reached by an opening in one of the central caves of the 3rd one. This level was used to store foodstuffs or to protect small domestic animals, as suggested by six tanks, built with squared stones coated with an adobe mixture and partially destroyed. In the last cave there is an interesting column with several traces of red paintings. Probably this room was devoted to religious worship or burial purposes. The 5th level is almost completely destroyed because of collapses.

Local inhabitants showed us other three rock dwellings in a range of 10 km from Shawbak Castle (in one of them tradition says cloistered nuns were hosted). Deeper studies are required to review the history of the anthropization in this area, the architectural features of the dwellings, the “link” between these dwellings and the castle. We think it is interesting to unveil these fascinating settlements not only for scientific purposes, but for tourism development too.

2 – Survey on radon concentration and spring waters

We performed the survey on the presence and concentration of radon for two main tasks. The first was to measure the presence of the radioactive gas and some environmental parameters for a possible use of the cavities near Shawbak as a tourist attraction. For this reason the radon concentration and the parameters were measured in one of the caves nearby the Shawbak castle, after the measurement in the gallery and in the dwellings above reported. The radon concentration was very low: 37 Bq/m³; the temperature constant at 11.5 °C and the humidity quite high (85%). The second task was to measure the concentration of radon in water; the samples were taken near the Shawbak castle, in the well known spring at the bottom of the hill S-W position and near the area of Roman ruins outside the village of Udruth (it was a strongly defended frontier town along the *Via Nova Traiana*; the old town collapsed because of earthquakes, but the Roman and byzantine ruins are impressive and interesting). Both the samples showed a low level of concentration: 12.61 Bq/l for Shawbak e 11.61 Bq/l for Udruth. Concerning the water chemical-physical parameters (pH, temperature and electric conductivity), a first measurement was devoted to the water coming from the underground spring at the bottom of Shawbak hill; measured values were in the characteristic range of carbonate water sources (pH 7.45; CE 672 · S/cm), while temperature was 14,6 °C, this can be explained with relatively long times of infiltration and underground circulation. Similar measurements were performed on the water coming from the Udruth well and now used for agricultural purposes. It is very possible that the water now in the well is the same captured once by the old qanat (Fig. 6), which is positioned at 1.5 km in direction S-SE from the Udruth well. In this case the temperature is quite high: 20.6° C, thus the pH value is 7.75 and the CE 567 · S/cm. It was also noted the presence of sulphur dioxide.

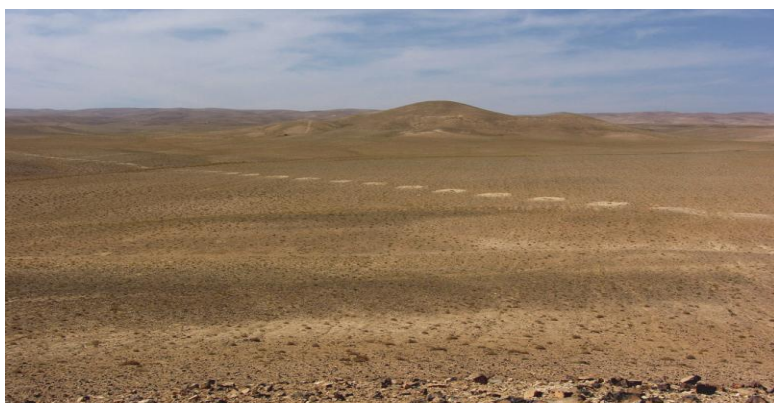


Fig. 6 the Udruth qanat shafts

showed a pH of 7.17 ; a temperature of 18.4° C and a CE of 1960 · S/cm, these values are different, mainly for the CE, from the values of the water collected in the spring S-W of the *Al Muqariya* village (pH 7,80; CE 595 · S/cm; T 18,3°C). This evidence confirms the influence of the human buildings over the characteristics of the surface water.

3 - Cultural Heritage of Shawbak castle and the neighbouring area

The preservation and valorization of the several cultural and environmental goods which are in the area of Shawbak seems to be quite complex both for the presence of several elements, different in their configuration and destination and for the need to implement a functional restoration of the structures through interventions compatible with the local traditional culture. The Shawbak castle restoration is currently performed according to projects and guide lines similar to those used for other forts in the region, so this will not be a subject of this paper. On the contrary, the restoration of the great gallery connected with the spring *Ain al Ragaye* has to be specific, considering its uniqueness, even if it is an element of the Shawbak complex,. The gallery is, as mentioned above, a remarkable engineering workmanship as it was planned and made to collect the water from the spring with safety also during possible sieges. Nowadays the gallery is visited only by some adventurous tourists without any organization; this is a very dangerous option; in our opinion it is essential and not to be postponed that a specific intervention should be conducted. The suggestion is to make a flyover platform which will allow an easy passage and bear the needed didactic props. The supporting structure will have a minimum impact and it will be devised in such a way as to be easily removed. Lighting will be planned and installed using the most advanced techniques already used within natural caves open to tourists and this will solve the problems related to this kind of interventions. Taking into account the configuration and the condition of the Shawbak gallery, such work will have very good prospects and the foreseen monitoring activity will help to solve any possible doubt. The intervention for tourism purposes on *hypogea* complexes is more difficult to realize. First it is to be taken into account their different typology: some of them were used as worship/burial places or as dwelling and now some are still used as cattle sheds. For the first type (worship/burial caves) it is important to solve the problem of excavation, in order to understand the complexity of their use over time; then, after their restoration, it will be possible to insert them in a didactic/cultural circuit. For the others, with the suitable precautions, the restoration will be possible only for the caves that are not still in use.

It will be interesting to think about the possible use of the various raised habitations, some of which are now semi-destroyed. The future large valorisation of Shawbak castle and the neighbouring area for tourism purposes opens the problem of visitor hospitality. There are already some plans to build accommodation facilities, but these structures will have a high impact on the environmental landscape. Thus the possibility to adapt these traditional raised habitations, after a suitable restoration, will open an interesting and innovative scenario of spread accommodation. This solution on one hand allows a functional restoration of the existing habitations, on the other hand a better involvement of the local population. The result will be a unique and attractive hospitality offer in an area rich in historical interest.

The peculiar structural complexity of the rock dwellings does not make impracticable the possibility of restoring them in such a way that would permit their visit as a part of cultural sightseeing tours. With an appropriate philological coverage, these tours would aim to offer visitors a global illustration of the relationship between a strategic defensive fortress and the economic and social system that evolved around it.

One of the aims of our work is to support local development. We are sure that further studies on these historical places and a suitable organization will lead to an articulated and interesting opportunity for tourism in South Jordan. *Not only Petra*: spending a couple of days in Shawbak and seeing the rock dwellings near the castle and the Udruth area can be an exciting program.

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