Wadi Aglat Winery: A Model for Long Term Planning and Investment in Agriculture in the Petra Area – a Question at the Beginning

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Abstract

Surveys in Wadi Aglat (West of "Little Petra") from 2010 – 2017 have revealed the existence of a winery with 2 wine presses and a farmstead. Before the winery could be set up, the outlet of Wadi Aglat into Wadi Beidha was barred by a dam closing the drop off into Wadi Beidha to a total height of 19 m. The construction of the retention dam led to the deposition of the soil sediments required for the plantation of the vines, hence the wadi proved to be an entirely man-made landscape. After the accumulation of the soil deposits the area was terraced for the plantation of the vines and a sequence of totally 17 wadi and 6 terrace barriers was erected to dam up the runoff water. Two wine presses in the western and eastern part of the wadi assured an efficient wine making. An extend farmstead in the western area served as operational center of the winery. In conclusion it may be stated that the winery in Wadi Aglat is so far the most elaborate model of agriculture by terracing in the Petra area and furthermore it bears witness for a long-term planning and investment in agricultural production.

Keywords: Nabataean Wine Production, Nabataean Economy, Royal Administration, Long Term Investment, Wine Presses, Farmstead, Dams.

Introduction

Have you ever asked yourself whereto the monumental, rock-cut staircase at the western end of Little Petra is leading to (fig. 1)? When I first visited Little Petra in 1991 I was told by my friend archaeologists that it was the rear entry used by the traders from Petra to come in and receive the caravan leaders. Years later, when I climbed up this staircase, I reached a narrow passage and then another staircase leading down. At the bottom of this staircase I found myself in a wadi bed and decided to follow it downstream. After around 400 m I reached its lower end and realized that its outlet into Wadi Beidha was an extremely narrow drop-off with a width of only 1.2 m and a height of 19 m(fig.2,3). Hence there was absolutely no rear

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access way to Little Petra from this side and the monumental staircase at the western end of Siq al Barid must have been built for completely different reasons!

Figure .1. View at the monumental staircase hewn into the bedrock at the western end of Little Petra.

Figure. 2. View from the outlet of Wadi Aglat down to Wadi Beidha. The drop-off has a height of 19 m.

Figure. 3.View onto the very narrow drop-off from Wadi Aglat into Wadi Beidha. It has a width of only 1.2 m.

Introductory Remarks

The discovery of the Wadi Aglat Winery was a side benefit of my research of Petra's hydraulic system. In 2001, surveying the runoff water retention systems built by the Nabataeans in the Beidha area, mainly inside "Little Petra" I climbed along a very narrow fault leading from the main Plaza inside Siq al Barid parallel to its southern cliff westwards. It led me again into the wadi bed at the bottom of the staircase at the end of Siq al Barid already mentioned in the paragraph above. During my survey on this visit I recorded several water installations and a well preserved, partially still backfilled and not fully cleaned wine press at the eastern end of the wadi. By asking people from the Amarin village I learnt that the name of this wadi was Wadi Aglat. As my research focus at that time was not yet on wine production, I didn't proceed with further research in Wadi Aglat. So the western wine press was first published by Zeyad al Salameen in 2004 (Salameen 2004: 176). From 2010 – 2017 I conducted more and intensified surveys in Wadi Aglat which revealed the existence of an extended winery occupying its full extension from the Western inlet to the eastern outlet and from the Northern to the Southern cliffs. In 2016 I entered into a co-operation with the Ba'ja Survey Project of Miami University, directed by David Graf, in order to integrate my private research about Nabataean wine

production into a more extended and comprehensive research project. In the frame of the **"**3rd International Conference on Petra and the Nabataean Culture" David Graf has presented the general research results and reflections of the project, hence for these aspects I refer to his contribution in this volume. My contribution will present the Wadi Aglat Winery as one of the most elaborate models of agriculture by terracing in the Petra area and furthermore it bears witness for a long-term planning and investment in the field of agricultural production. The presentation of the preliminary results of the Wadi Aglat Winery Project following here under is a "workshop report", an insight into an archaeological work in progress, including a outlook into future work implementation steps.

The Location Of Wadi Aglat

Wadi Aglat is located to the West of Siq al Barid or Little Petra. It is a "deadlock"-wadi with no walkable entrance or exit. It is almost oriented West-East, its lowest section sharply diverting in direction South to the drop-off into Wadi Beidha. Its upstream end lies at a height of 1097 m, its outlet at 1074 m. The level of Wadi Beidha below the drop-off is at 1055 m. The entire length of Wadi Aglat measures 1.19 km, its width differs from a maximum of 130 m to a minimum of 10 m. The topography of Wadi Aglat is characterized by two extended pans at the western and the eastern end and a meandering wadi bed in-between with alternating widths (fig. 4).

Figure.4. Satellite view showing the location of Wadi Aglat with the course of the wadi bed highlighted in red. The dots at the upstream and downstream end of the wadi bed indicate the highest and the lowest point. The isolated red dot West of Beidha Neolithic Village indicates the bottom of the drop-off between Wadi Aglat and Wadi Beidha. The green surface highlights the extension of the former winery. (Extract from Google Earth, key U.Bellwald).

The Results Of The Surveys 2010 - 2017

In the course of the field work from 2010 – 2016 all the visible archaeological remains in Wadi Aglat were meticulously documented by photographs, drawings and GPS-localization. In May 2017 the entire area of Wadi Aglat was mapped and all visible archaeological remains recorded in the topographical contour-line map in the scale of 1:500 Fig. 5). The details of the main archaeological elements were mapped in the scale 1:50. The field work and the mapping from 2010 - 2017 revealed the existence of an extended winery occupying the full extension of Wadi Aglat from the Western upstream end to the eastern outlet and from the northern to the southern cliffs. In an initial step for the set-up of Wadi Aglat Winery the outlet of the wadi bed into Wadi Beidha was completely barred by a retention dam of solid masonry with a height of 4.9 m, a width from 98 cm to 170 cm and a thickness of 69 cm (Fig. 6). The blocks of the masonry were accurately embedded in grey hydraulic lime mortar in order to prevent any water to run off. In the western cliff the dam is flanked by a niche sanctuary framed by pilasters and an altar with three footings for the insertion of betyloi, both directly hewn into the bedrock (Fig. 7, 8). My research for the hydraulic infrastructure of Petra has revealed, that almost all solid dam constructions, either flash-flood retention dams, diversion dams or storage dams were accompanied by niche

sanctuaries (Bellwald 2003, p. 81 – 84, Bellwald 2008, p. 76 – 86). It may be assumed that the niche sanctuaries accompanying dams or aqueduct bridges were installed with the aim of asking selected gods or goddesses to prevent the construction from being damaged by natural disasters. That no other hydraulic structure in the entire Petra area is accompanied by a niche sanctuary and an altar as the main dam at the outlet of Wadi Aglat into Wadi Beidha shows, how much care was invested in the set-up of this specific winery. By holding back the material dissolved by winter rains from the rock formations surrounding the wadi, the construction of the dam led to the natural deposition of the soil sediments required for the plantation of the vines. By identifying the human intervention of constructing the main retention dam Wadi Aglat in its actual topography proves to be a completely artificial, man-made landscape. In its original shape the wadi bed was much steeper and narrower and there were no farmable surfaces along its banks.

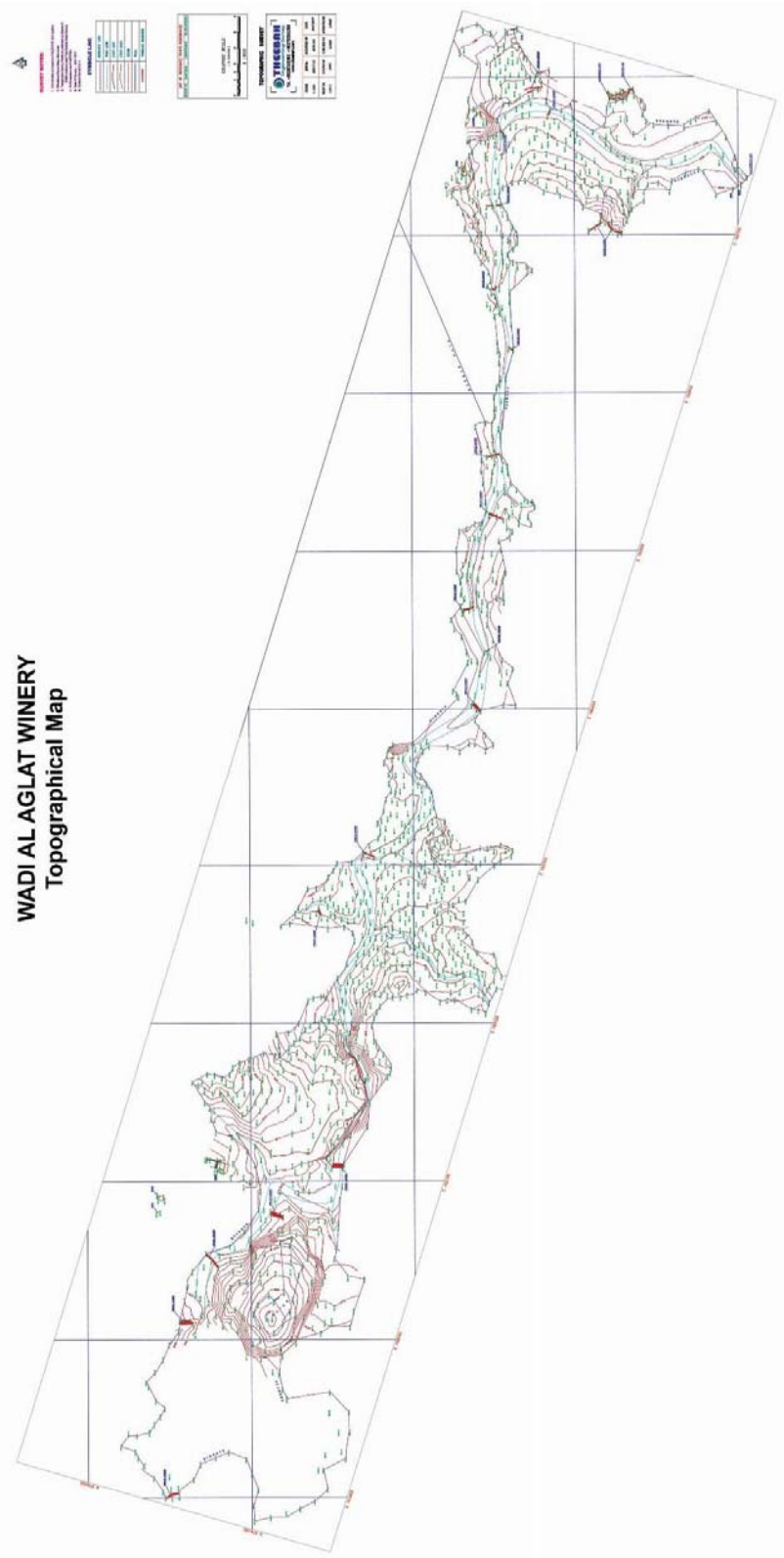


Figure. 5. Topographical map of Wadi Aglat, original scale 1 : 500, showing the location of all archaeo- logical remains recorded. (Drawing Theebah, Amman)

Figures. 6-8. View onto the crest of the retention dam closing the drop-off towards Wadi al Beidha (left), frontal view at the niche sanctuary and onto the altar with 3 footings for the insertion of Betyloi, chiseled out of the western cliff flanking the dam (center and right).

Upon completion of the accumulation of the sediments upstream from the main retention dam the course of Wadi Aglat was further terraced for facilitating the plantation of the vines. Along the course of the wadi bed upstream from the main retention dam a sequence of 17 wadi barriers were built. A wadi barrier is a facility built for holding back runoff water and for reducing its outflow velocity. Furthermore barriers have the duty to increase the upstream surface level by building up sediments. In order to withstand the water pressure from upstream, barriers are constructed in dry masonry, without any mortar in the joints, allowing the water to seep through the voids. Based on their location, outlet, and dimensions, three categories of the wadi barriers may be distinguished in Wadi Aglat: The 2 main wadi barriers had an original height of approximately 3 m and a thickness of up to 2.5 m. They are located at the inlet and the outlet of the extended wide pan at its western upstream end and led to the accumulation of huge sediments creating an extended, even area for cultivation (Fig. 9, 10, 12). They still stand nowadays to a height of 2.5 m, but have partially collapsed with the result that the runoff water in wintertime has locally washed out the accumulated sediments to the original surface of the bedrock. Such recent erosion allows an impressive “x-ray” insight into the stratigraphy of the sediments. The most overwhelming such profile may be seen at the foot of the rock outcrop bearing the ruins of the farmstead (Fig.11). Ruins of masonry at the bottom of the profile prove that Wadi Aglat was used by humans even before the installation of the winery. The three major wadi barriers had originally almost the same dimensions as the main wadi barriers, but they were not erected for accumulating huge, extended sediments, but for taming down the outflow speed of the runoff water. They are all located in steep, curvy sections of the wadi bed. Two of them are

located immediately downstream the rock outcrop bearing the ruins of the farmstead where the wadi bed has a course of the sharp S.

Figures. 9, 10. View at the well preserved northern section of the downstream face of the main wadi barrier at the northern foot of the rock outcrop bearing the ruins of the farmstead (left) and view from North onto the well preserved section of the same wadi barrier. The frontal view shows well the typical construction method of a wadi barrier, well-dressed ashlar blocks set up as dry masonry without any mortar binding.

Figure. 11. View from West at the stratigraphy of the sediments built up upstream the main wadi barrier shown here above, exposed by erosion after the partial collapse of the construction. Below the scale the ruins of some older buildings may be detected.

Figure. 12. Panoramic view from North into the pan at the upstream end of Wadi Aglat. By the wadi barrier built at the outlet of Wadi Aglat from this pan the Nabataeans were not only able to accumulate the required fertile soil covering the former rock surface, but also created a vast plane surface for establishing the vineyard.

Along the sections of the wadi bed with a limited width and a rather gentle slope a sequence of 12 average wadi barriers was built. These barriers had a height of about 1.2 m; their width depended on the width of the wadi bed, as they completely closed it from the northern to the southern cliff. The thickness varies from 1 m to 1.5 m (Fig. 13, 14). As the main and the major wadi barriers the average ones were built with well-dressed ashlar blocks of local sand-stone. The sequence of the average wadi barriers changed the course of the wadi bed into a stepped cascade with a gentle slope, reducing the outflow velocity of the runoff water tremendously in order to protect the vine plantations from being damaged by erosion of the fertile soil. As the average terrace barriers used both cliffs as their abutments, they closed the wadi bed over its complete cross section, hence the gently outflowing runoff water reached all rows of vines planted on both embankments.

Figures. 13, 14. View at the downstream face of two well preserved average wadi barriers in the central section of Wadi Aglat. The photographs show well, that the abutments of the construction touch the bottom of the cliffs. The dry masonry of these wide barriers with limited height has been erected with the same well-dressed ashlar blocks as in the main and major wadi barriers.

In the wide areas at the upstream and the downstream end of Wadi Aglat the slopes reaching up to the bottom of the flanking cliffs have steeper slopes compared to the lower areas built up by artificial sedimentation due to the construction of the wadi barriers. In order to secure the plantations in these higher locations from being washed down terrace barriers were built. Terrace

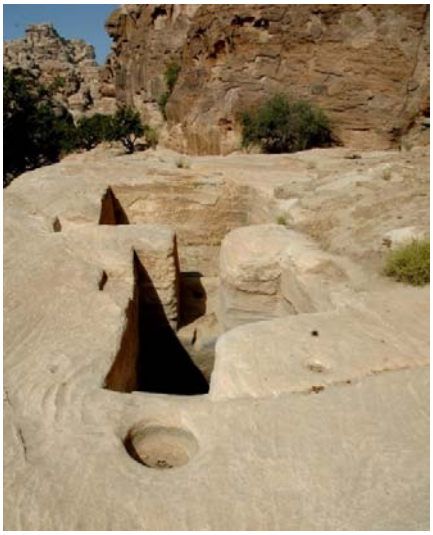
Barriers are also constructions in dry masonry, erected along slopes like contour lines in order to decrease the gradient by dividing the slope into a sequence of stepped terraces. The sediments built up upstream the terrace barrier are absorbing a great part of the runoff water and storing it for fostering agricultural production. Furthermore terrace barriers are stabilizing the soil and hence prevent surface erosion. During the various surveys, three sets of terrace barriers could be recorded with a total of six single walls. Most probably in the future of the project more such terrace barriers may be discovered, as some of them may be have been buried by debris washed down during winter floods. One buried terrace barrier

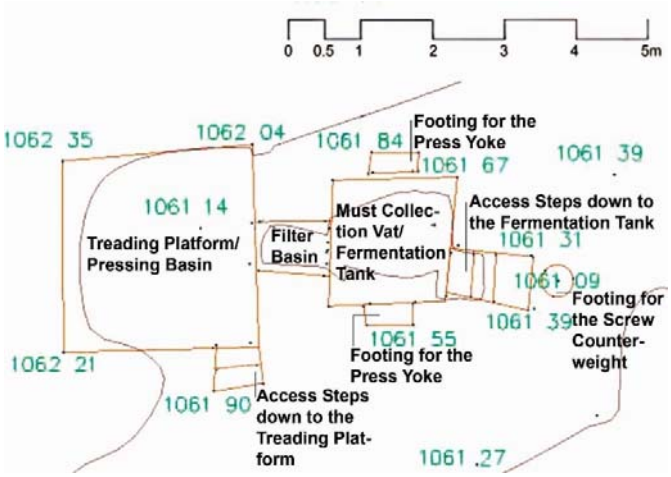
was recently exposed in an angle of the western cliff close to the outlet of the wadi bed into Wadi Beidha (Fig. 15). All the visible and recorded terrace barriers were not built with well-dressed ashlar blocks, but with flat sand-stone hunks collected from the surface in the area where they were erected. Between the terrace barriers and in areas with a very gentle slope the ground was prepared for planting the vines by simply terracing the soil with rakes or similar tools. Due to the very remote location of Wadi Aglat even a great number of these ground terraces are preserved and still visible today (Fig. 16).

Figures. 15, 16. In steeper areas where runnels risked to sluice out the terraces they were reinforced by terrace barriers of which 6 have already been detected and surveyed (left). One of the most thrilling discoveries were the still well visible artificially modeled terraces worked out by simply stepping the ground with rakes or similar tools along which the vines were planted (right). Instead of vines nowadays Mediterranean onions are growing on the terraces.

Two huge wine presses in the wide eastern and western pans of the wadi allowed an efficient processing of the grape harvest. The eastern wine press is located at the inlet from the narrow central section of the wadi into the wide eastern pan; it is inserted into a rock terrace at the bottom of the northern cliff. As it is occasionally used by Bedouins as a drinking trough for goats, it has partially been cleaned, but nevertheless the original bottom of all its basins is not yet visible. The eastern wine press consists of an extended, square treading platform which was also used as pressing basin. From the treading platform the must flew through a valve into the rectangular filter basin, from where another valve conducted it into the fermentation tank. Two sets of stairs gave access to the bottom of the treading platform and the fermentation vat. Absolutely exceptional are the well preserved footings of the wooden press construction on both sides of the fermentation vat and on the eastern side of its access stair. The two rectangular inundations on both sides of the fermentation tank were made for anchoring the yoke keeping the long press beam in its position, whereas the circular cut in front of the stair was used as a foundation for the counterweight of the wooden screw for pulling the beam down Fig. (17, 18). These footings hence allow a rather precise reconstruction of the wooden press mechanism (Fig. 19, 20). The

dimensions of the almost square fermentation vat are 1.65 m x 1.75 m; its depth from the bottom to the inlet valve from the filter basin may be estimated to 1.8 m. Therefore the fermentation vat had a capacity per pressing process of 4331 lt.



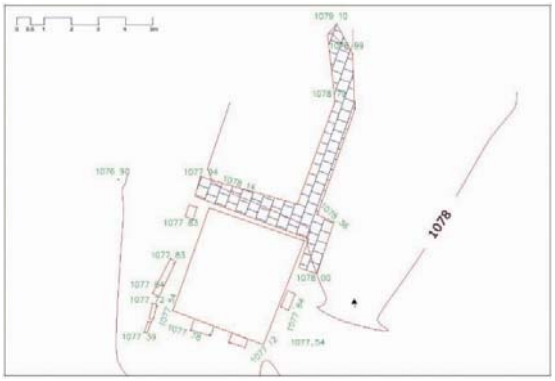


Figures. 17, 18. View from East onto the eastern wine press with a treading and pressing basin, a filter basin and a must collection and fermentation vat. Indentations in the bedrock around the basins are hints to the wooden press construction (left). Plan of the eastern wine press with the keys to its single elements. Plan Theebah, key U. Bellwald (right).

Figures. 19, 20. View from Southeast at the eastern wine press (left). The same view showing a reconstruction of the wooden construction for the press with the yoke, the press beam and the screw-counterweight mechanism for pulling it down (right).

The western wine press is located on the northern slope above the wadi bed opposite the hilltop with the ruins of the farmstead. From its various single elements only the huge square treading platform / filter basin is actually visible, all the other basins and installations are still completely buried (Fig. 21, 22). Similar to the eastern press also the western one shows footings for the anchorage of the wooden press mechanism. As both wine presses in Wadi Aglat have huge and deep treading platforms where the grapes were crushed by foot, the must could be

stored together with the skins and the stems of the grapes for a while before being conducted into the filter basin. By such a procedure the must was able to absorb the dye from the skins and hence got a red color. It is therefore most probable that the Wadi Aglat Winery produced mainly red wine.



Figures. 21, 22. View from North onto the western wine press with an extended treading and pressing basin, surrounded by footings for anchoring the wooden press construction. The filter basin and the must collection and fermentation vat are still buried (left). Plan of the western wine press, drawing Theebah (right).

Hydraulic installations in the close neighborhood of both wine presses assured a sufficient supply with runoff water for the needs of the wine making procedure. The most impressive such installation is a retention dam located at the eastern embankment of the wadi bed South of the eastern wine press. It closes the western section of a long and narrow fault parallel to Siq al Barid. The dam is 3 m wide and still stands up to a height of 2 m, but originally it was at least 1 m higher. Its masonry is 60 cm thick and set up with well-dressed ashlar blocks, fully embedded in grey hydraulic mortar (Fig. 23). The extended catchment basin upstream the dam had a length of approximately 400 m, hence it allowed the storage of at least 2500 m^3 of water. To give access to the water reserve in the catchment basin a stair was hewn into the rock outcrop at the northern abutment of the dam. It winds up to the crest of the dam in an elegant S-shaped line (Fig.24). On a rock outcrop opposite the eastern wine press the partially eroded remains of a working platform with a cistern and a hand washing basin are preserved. At the foot of the northern cliff above the western wine press a huge cistern is hewn into the bedrock, accompanied by a great niche sanctuary some meters further westwards (Fig. 25, 26).


Figures. 23, 24. The retention dam for storing runoff water South of the eastern wine press. It closes a long and narrow fault running parallel to Siq al Barid (left). View from West at the rock outcrop at the northern abutment of the dam with the stair winding up to its crest in an elegant S-shaped line (right).


Figures. 25, 26. Cistern hewn into the bedrock at the foot of the northern cliff above the western wine press (left). Niche sanctuary located to the west of the cistern (right).

On top of a hill overlooking the wide, even uppermost part of Wadi Aglat the ruins of a large farmstead could be identified, which most probably served as the administrative and logistic center of the winery. Actually only small sections of walls may be detected on the ground, therefore no attempt of an even schematic reconstruction may be given, But as the blocks from the collapsed walls are spread all over the entire hilltop it may be assumed that the building occupied the full plateau (Fig. 27-29).

Figure. 27. Panoramic view from North over the wide, even uppermost part of Wadi Aglat. The ruins of the farmstead are located on the hilltop framed by trees. At the bottom of the hill the ruins of one of the main wadi barriers may be seen.

Figures. 28, 29. Close view from North at the rock outcrop with the ruins of the farmstead on its hilltop (left). View from West onto the ground of the hilltop with blocks from the collapsed walls splattered all over the surface. Among the blocks scattered on the surface a well preserved door-jam may be detected (right).

Dating The Wadi Aglat Winery

As no excavations have been undertaken in Wadi Aglat, all attempts to date its construction time and the period of its use may only be based on pottery shards which were collected from the surface around the wine presses and inside the ruins of the farmstead. The interesting fact in identifying the collected pottery is, that the results remain the same for all three locations. Based on the chronology of the Nabataean fine ware pottery established by S. G. Schmid, the earliest shards represent sub-phase 2a, dated to the third quarter of the 1st century BC. Only few shards from this phase have been found. Much more of the collected shards represent sub-phase 2b, dated to the last quarter of the 1st century BC. The biggest number of shards represent the sub-phases 2c – 3b, which may be dated to the full extent of the 1st century AD. Only very few shards represent the sub-phases 3c and 4, dating to the 3rd and the first half of the 4th century (Schmid 1996,1997,2000). Absolutely no shards dating to a period after the earthquake of 363 AD were found. The unpainted fine ware and the coarse ware shards confirm this dating attempt (Gerber 1994,1997). It may therefore be proposed that the Wadi Aglat Winery was established in the 3rd quarter of the 1st century AD and had its blooming period of production in the 1st century AD. From the 2nd to the mid of the 4th century AD the

winery was still under operation, but most probably on a more modest level. After the earthquake of 363 AD, which destroyed at least partially the wadi and terrace barriers and which led to the complete collapse of the farmstead, the winery in Wadi Aglat was abandoned.

In Conclusion

Without any doubts it may be stated that the winery in Wadi Aglat, as presented here above, is one of the most elaborate models of agriculture by terracing in the Petra area. Furthermore it bears witness for a long-term planning and investment in the field of agricultural production. Preliminary estimations have shown that the accumulation of the sediments upstream the main dam and the main and major wadi barriers took around 30 years. The entire surface for the cultivation of vines, resulting from the terracing of the wadi bed, finally covered an area of 5 hectares which equals an annual yield of around 30'000 liters of wine, based on the numbers given by Lucius Junius Moderatus Columella (4-70 AD) in "De Re Rustica III.3.2-3 and 9.2, written around 64 AD. To answer the question asked at the beginning of my contribution, it has to be highlighted that the winery in Wadi Aglat is exclusively accessible from Little Petra. Hence the monumental, rock-cut stair-case at its western end was uniquely built to get access to the winery. Therefore it is obvious that the winery and the rock-cut tri- and biclinia in Little Petra have to be seen as one unit (Fig. 30). This makes it very improbable to consider Little Petra as the office suburb for the traders from Petra, but it might have served as a highly sophisticate banquet area for wine tasting and wine promotion and wine selling. The co-operation of the Wadi Aglat Winery Project with the Ba'ja Survey Project of Miami University, directed by David Graf, has allowed to shed new light into the wine production of the Nabataeans and its socio-economic aspects. As the wine production is concentrated in the Beidha-Ba'ja area and considering the long-term planning and investment into undertakings like the set-up of the Wadi Aglat winery, it has to be thought of the wine production as a royal monopole with a governmental director as superintendent of the wines, equal to the "Praepositus Vinorum" of the Roman Emperors (Schwinden 1996, p. 49-60). His offices and his residence could well have been in the luxurious mansion Patricia and Pierre Bikai excavated on the elongated rock outcrop just to the East of Siq al Barid (Bikai, Kanellopoulos, Saunders, 2008).

Future Project Implementation Steps

In 2020 it is planned to execute a certain number of soundings in the area of the wine presses, upstream in the main, major and average wadi barriers and in the farmstead. More trenches will be opened in the area of the well preserved terraces where the vines were planted Hopefully these soundings will provide us with sufficient organic material, with remains of vines (roots, branches, stems, grape pips), allowing us to make extended archaeo-botanical research in order to get information about the species of vines planted in Wadi Aglat winery. Maybe at the end we will even be able to determine the region from which the vines were originally imported For these investigations we will cooperate with the archaeo-

botanical institute of Zurich university under the direction of Dr. Cristiane Jacquat. For the determination of the origin of the vines we will cooperate with the archaeological institute of the university L'Orientale at Naples under the direction of Prof. Romolo Loreto. For the soil analysis our expert will be Prof. Bernhard Lucke from the Friedrich-Alexander University at Erlangen-Tuebingen.

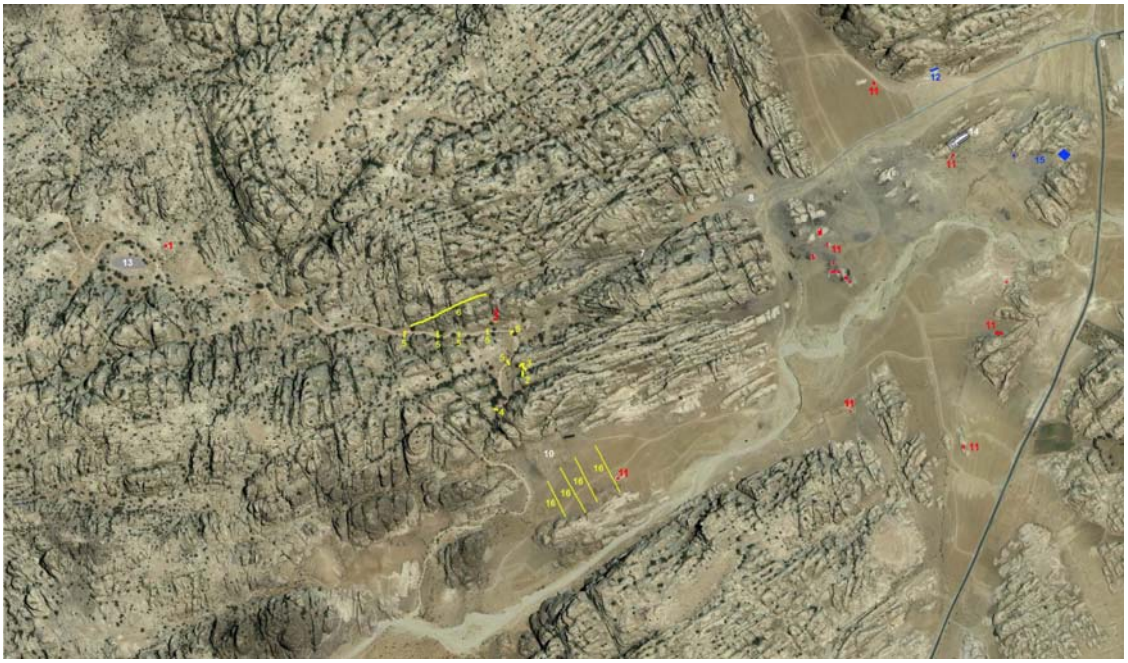


Figure. 30. Satellite view showing the entire area of Beidha and Wadi Aglat with the marking of the most important elements connected with wine production:

1 (red) Wine presses in the Wadi Aglat Winery. **2** (yellow) Wadi Aglat retention dam for storing runoff water during winter rains for irrigation in summer time. **3** (yellow) Maintenance stairs giving access to the catchment basin behind dam 2. **4** (yellow) Main retention dam closing the outlet of Wadi Aglat into Wadi Beidha. **5** (yellow) Sequence of average wadi barriers in Wadi Aglat for damming up the runoff water to the height of the vines. **6** (yellow) Staircase connecting Little Petra with Wadi Aglat. **7** (white) Little Petra. **8** (white) Visitors parking for Little Petra. **9** (white) Intersection to Little Petra from the main road Umm Sayhun – Waste Water Treatment Plant – Wadi Araba. **10** (white) Neolithic settlement of Beidha. **11** (red) Wine presses in the eastern and southern Beidha area. **12** (blue) Main cistern for the water supply of the wine presses 11. **13** Farmstead of the Wadi Aglat Winery. **14** Mansion excavated by ACOR. **15** Cisterns to the vaulted rock chamber. **16** Terrace barriers in Wadi Beidha. Satellite view courtesy D. Comer, key U. Bellwald.

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مصنعُ النبيذ في وادي عقلات: نموذجٌ لتخطيط طويل المدى واستثمار زراعيّ في منطقة البترا – سؤالٌ عن البداية

أورليخ بيلوالد

ملخص

كشفت المسوحاتُ في وادي عقلات (غرب البترا الصغيرة "بيضا") في الفترة ما بين 2010 و 2017 عن وجود مصنع للنبيذ، يتكوّنُ من معصرتين ومزرعة. وقبلَ إنشاء هذا المصنع حُجِزَت مياهُ الأمطار التي تجري من وادي عقلات وتصبُّ في وادي بيضا من خلال سدّ، الأمر الذي جعلَ الماءَ في وادي بيضا يصبُّ على ارتفاع 19م، وقد أدّى بناءُ السد إلى تراكم رواسب التربة اللازمة لزراعة أشجار الكرمة؛ وَبِذا ثبتَ أن الوادي برمّته بيئةٌ من صنع الإنسان. وبعد تراكم رواسب التربة بُنِيَت مصاطبُ لغرس أشجار العنب، وفي المحصّلة بُنِيَ سبعةَ عَشَرَ حاجزًا في الوادي وستُّ مصاطب لحجز مياه الأمطار الجارية، أمّا معصرتا النبيذ الموجودتان في الجزأين الغربي والشرقيّ منَ الوادي فَضَمِنَتا إنتاج النبيذ بفاعليّة، كما استُخدِمَ بيتُ المزرعة الموجودُ في المنطقة الغربيّة مركزًا لعمليات إنتاج النبيذ. وعليه، فيمكنُ القول إنّ إنتاج النبيذ في وادي عقلات نموذجٌ أكثرُ تفصيلًا للزراعة من خلال المصاطب في منطقة البترا حتى الآن، وهو شاهدُ على التخطيط طويل الأمد والاستثمار في الإنتاج الزراعيّ.

الكلمات الدالة: إنتاج النبيذ عند الأنباط، الاقتصاد النبطيّ، الإدارة الملكيّة، الاستثمار طويل الأمد، معاصر النبيذ، بيت مزرعة، السدود.

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