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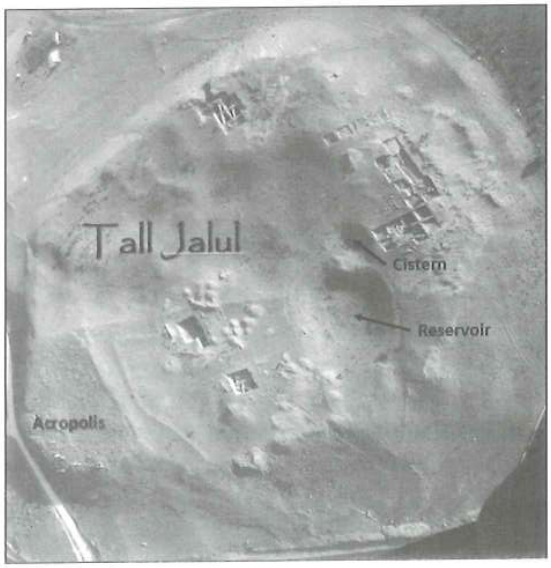
Water System of Tall Jalūl

Tall Jalūl is located 5 km east of Madaba, sitting on an elevated mound surrounded by wheat and barley fields and also by numerous orchards. It has a commanding view of the entire area controlling the trade routes and other movements whether military troops or different groups of people. The site attracted people from early history (Early Bronze Age) to settle there. Since access to water was one of the primary factors for settlement, it is very likely that the site had natural water source. Due to its close proximity to the desert, it is most likely that the site had a spring or water source which attracted the first settlers. Even before excavation started, based on the surface depression, it was evident that the site had access to water. This earthen depression is located in southeastern corner of the site, and measures approximately 35 meters in length and 25 meters in width (FIG.1). Above the northeastern corner of the depression there is a closed cistern[1].

Excavations at Tall Jalūl started in 1992 when Fields A and B were opened. In 1994 Field C was added while work continued in Fields A and B. The next season (1996) Field D, which was in close proximity to Field C, was opened. Excavation started on an elevated area located on the northeastern ridge of the site during 1999 which became Field E. During 2005, Field F was opened to investigate area just north of the acropolis. Next season, 2007, Fields G and H were added on the southern side of the tell to investigate a possible defense system of the



1. Tall Jalūl.

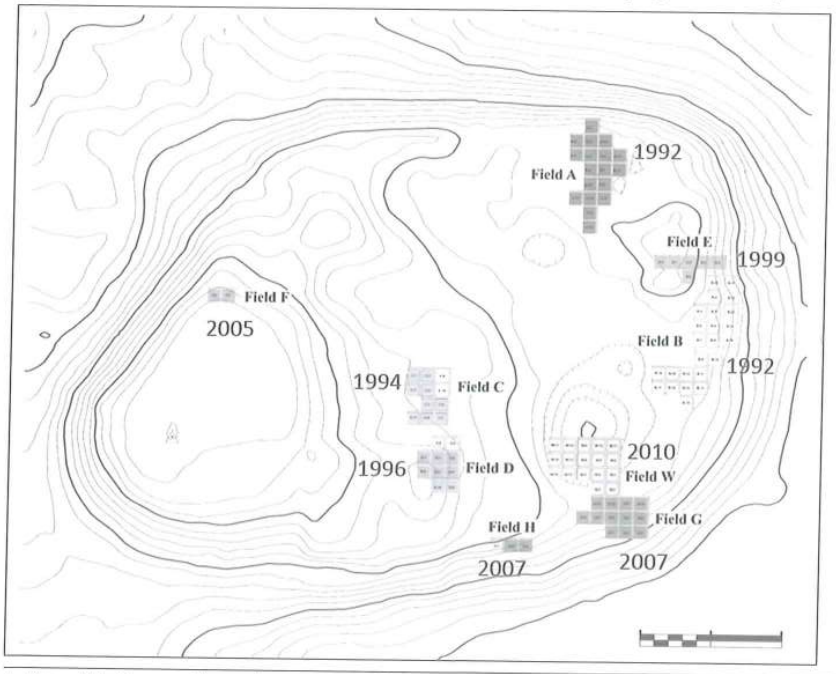
1. Construction of this cistern is not known. Most likely it was created at the time when open air reservoir went out of use during the Persian period. This however is only a speculation since cistern has not been excavated.

site. Finally, as a result of the discovery of water channel found in Field G, Field W was introduced during the 2010 season (FIG. 2)[2].

A "platform", south of depression, became area of interest due to several exposed stones, due to erosion, which looked like a wall and was designated as Filed G in 2007. During the course of the season several architectural features were discovered. The southeastern corner the city wall was discovered (G2. L5), dated to 10th Century BC, and also a water channel with its floor (G2. L38) and channel walls (G2. L4 and G2. L16) (FIG.3). During the following seasons it seemed clear that the channel comes from the area of great depression, which prompted the opening of the Field W in 2010. Since then 17 squares have been excavated in this field, where an open air reservoir was discovered. At first, the bottom of the reservoir was discovered in Square W5, and after excavating a probe into its floor it became evident that it consisted of several layers of compact lime plaster, which were most likely laid during different periods. Four distinct layers of plaster were visible, indicating as many reconstruction/repair stages during its use (FIG. 4). Since the fact that the floor sits on bedrock, it was impossible to find the probable date of its first construction. The entire reservoir was chiseled into bedrock where on it southern and western sides the constructors had to chisel for more than 2.0 meters (FIG. 5). The floor and the sides of the reservoir were plastered with a mixture of lime and crushed flint stone to create a compact and very hard surface. The eastern side of the reservoir was dug only one meter into the bedrock, and then a wall was built to increase the hight of the reservoir to 3.0 meters.

The reservoir sits on bedrock, and from the material found under its floor is impossible to date. For this reason, several squares (W2, W6, and W11) were opened outside the reservoir and adjacent to its eastern sides to find the date of its construction. Squares W2 and W6 brought the best results and enough material to project the time when the reservoir was built.

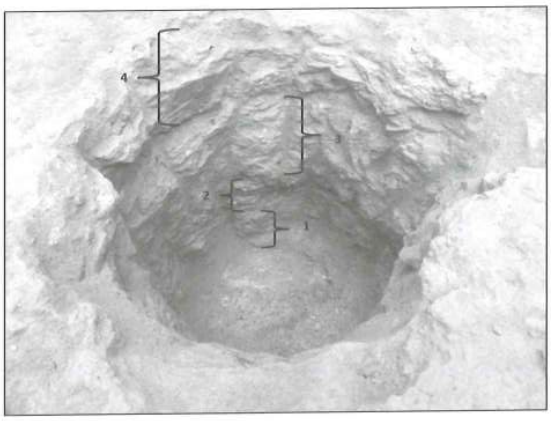
Square W2 was excavated all the way to the bedrock which was covered with 1.0 meter thick layer filled, with Early Bronze pottery sherds. The pottery assemblage was made of handmade pots consisting of flat base bowls, ledge handles, jugs with loop handles, and holemouth jars. Red



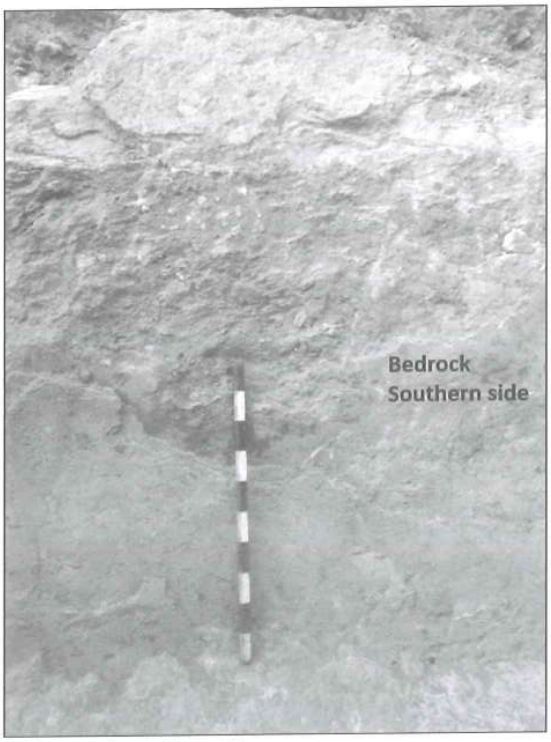
2. Topographical map.

2. For publications on the previous seasons of excavation, see the bibliography.

3. Water channel.



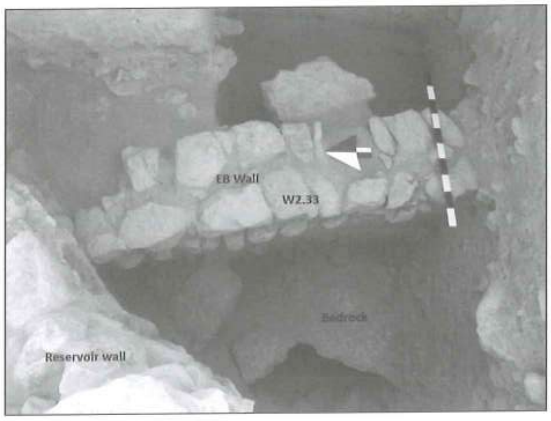
4. Reservoir floor.



5. Reservoir southern side.

and grey burnish were not found on any of the fragments, but net pattern burnish was found on one sherd. Above the Early Bronze Age debris, a small wall (W2.33) was found, that consisted of two courses, constructed from small and medium, roughly-hewn stones, lined in two rows (FIG. 6). The pottery found on floor of this building is very similar to that which was found under it, making this structure the oldest one found on the tell so far. It is most likely that the settlers of this period were attracted by presence of a natural water source to establish their settlement. The wall was partially ruined and destroyed at the time when reservoir was constructed.

above the early bronze age material, layers filled with late iron age i and early iron age ii were deposited. there is a complete absence of middle and late bronze material culture in between. the layer with late iron age I and early iron age ii ceramics was about 0.6 meters thick, above which the first of three floors were laid (FIG. 7). based on the pottery found under, and immediately above these floors, it is evident that they were constructed during different centuries. the earliest floor is dated to the 10th Century BC, the second to the 9th Century BC, and the third to the 8th Century BC it would seem that the upper layers of the reservoir's wall were robbed and it was impossible to find, in square w2, any connection between these floors and the reservoir wall. for this reason square w11 was opened, in 2012, to examine



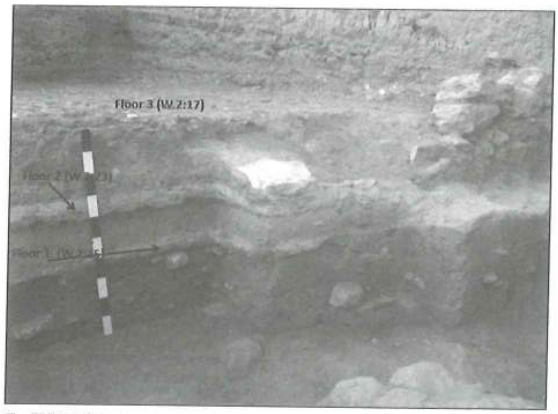
6. EB structure.

closely the same floors and layers and see if these floor sealed against the reservoir wall.

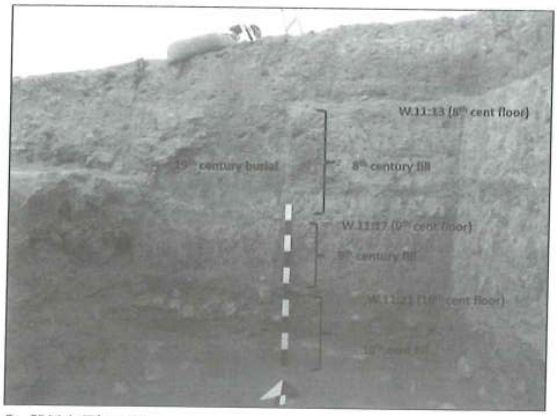
All three floors and layers found in Square W2 were also present in Square W11 (FIG. 8). This time, the first (10th Century BC) and second (9th Century BC) floors sealed against the reservoir wall, indicating its earliest construction during the 10th Century BC, with the wall slightly elevated when the 9th Century BC floor was established. The exact elevation of the reservoir wall is not clear since the top of its remaining stones are just 50 centimeters below the present surface. Whether the top section of the wall was robbed during the course of the time remains unclear. The third (8th Century BC) floor was disrupted by a 19 Century burial, and its connection to the reservoir wall is not present in this square (FIG. 8). These three floors were not created as floors within any architectural structure, but most likely served as paths or roads to provide a solid surface for those who were coming to get needed water from the reservoir. Stairs to the reservoir have not yet been found since only about half of the reservoir has been cleared of the fill which was deposited there during the centuries since the reservoir went out of use.

After the 8th Century BC floor went out of use, it was filled with 0.50 m of debris to create a surface, upon which a water channel was constructed (FIG. 9). The water channel was first discovered in Field G during the 2007 season of excavation. During the course of several consecutive seasons (2009-2012) it was revealed that the channel is directed toward the water reservoir, but before it connects, it turns north and runs paralleled with the eastern edge of the reservoir wall (FIG. 10). Since the northern section of the water channel is close to surface, its existence is limited only in fragmentary way. Also it is evident that the section of the water channel that exits the site is lower than its northern section by 0.73m, which indicates that its purpose was to drain water from the city limits outside the city wall. The channel is 0.50m wide and its walls are more than 1.0m high. Both walls and floor of the channel were covered with thick layer of lime plaster (FIG. 11) to prevent the water leakage.

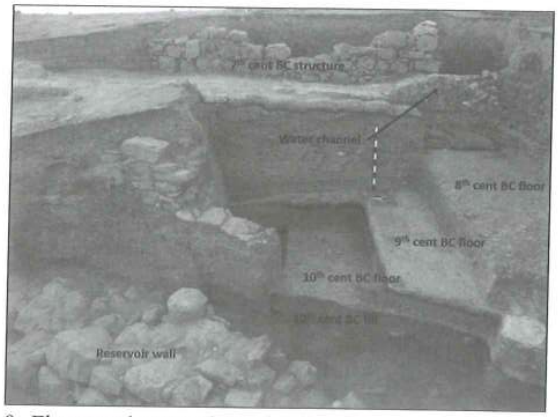
It appears that the floor of the water channel is almost 1.5 meters higher than the top of the reservoir wall (FIG. 10), indicating that the channel was not used to drain water from the



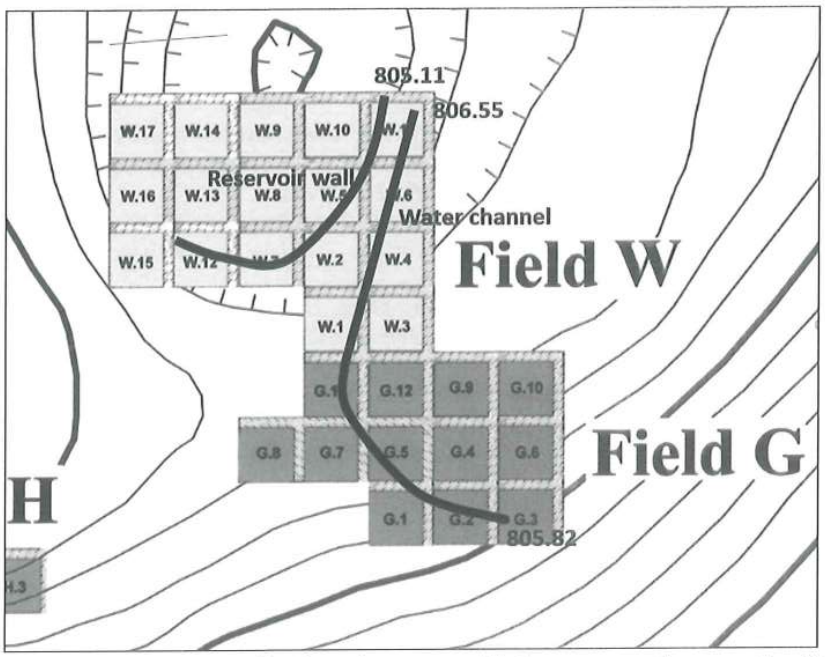
7. W2 Floors.



8. W11 Floors.



9. Floors and water channel.

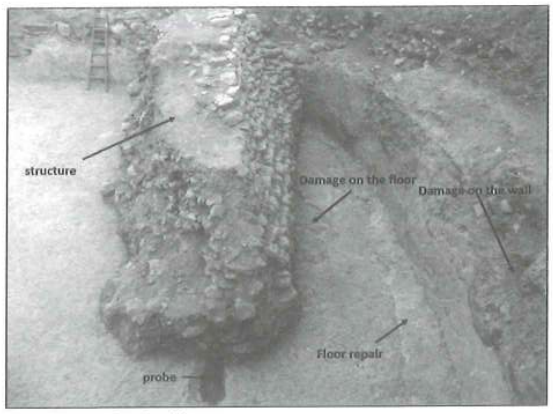


10. Reservoir wall and water channel.

reservoir. However, this is only correct if the present wall of the reservoir would not have been higher at the time of its use. Due to the fact that most of the walls throughout the tell suffered loss of its stones, by robbing activities, it would not be impossible to accept the fact that the reservoir walls were higher in antiquity than at present.

Based on the pottery assemblage collected above the reservoir floor, it is evident that it went out of use after the 7th Century BC. It seems that around that time the inhabitants of this settlement had problems keeping the water within the reservoir since there is evidence of floor damage in its southern section. Also southern wall of the reservoir seems to have suffered from the same problems. In addition, there is evidence of a plaster repair to the area where the floor meets the wall in the same section (FIG. 12). After all attempts failed to hold the water, the inhabitants decided to partition the reservoir by building a dam-like structure to isolate the unrepairable section (FIG.12). Before building this structure on the floor of the existing reservoir, the constructors dug a probe into the floor to test its foundations to make sure that it would hold the weight of the structure. The structure is partially preserved and measures 3.0m high and 3.0m wide at its base. It consists of two parallel walls with fill

11. Water channel.



12. Reservoir looking east.

placed between them. The southern wall was constructed on an angle, while northern wall appears to be built in straight up fashion. Due to its open air nature and capacity, it seems likely that the reservoir was supplied by the spring water. When full it could contain at least 3000 cubic meters of water. When the need for the reservoir expired (because of its unsustainability or decrease in population of the site) it was abandoned, and soon after[3], a closed cistern was built in the vicinity of the reservoir, but of much smaller capacity. Since the floor of the cistern is at least 4.0 m lower than the floor of the reservoir, it was possible to divert the spring water from the area of reservoir into the cistern.

Bibliography

Gane, C.E., Younker, R.W., Ray, P.J., Borstad, K., Burgh, T., Gane, R.E., Gregor, P.Z., Groves, J.L. and Al-Shqour, R. 2010. Madaba Plains Project: Tall Jalul 2009. *Andrews University Seminary Studies* 48: 165-223.

Gregor, P.Z. 2009. A Tripartite Pillard Building in Transjordan. *ADAJ* 53: 9-19.

Gregor, P.Z., and Gregor, H. 2009. Preliminary Report on the Tall Jalul 2007 Season: Field A. *ADAJ* 53: 21-26.

—— 2010. Preliminary Report Tall Jalul 2009 and 2010 Seasons, Field G and W. *ADAJ* 54: 493-98.

Gregor, P.Z., Ray, P.J., Younker, R.W., and Gane, C.E. 2011. Preliminary Report on the 2011 Season of the Madaba Plains Project: Tall Jalul Excavations 2011. *ADAJ* 55: 351-62.

Gregor, P.Z., Younker, R. and Ray, P.J. 2012. Preliminary Report on the 2012 Season of the Madaba Plains Project: Tall Jalul Excavations 2012. *ADAJ* 56: 201-05.

Herr, L.G., Geraty, L.T., LaBianca, Ø.S. and Younker, R.W. (eds.). 1994. Madaba Plains Project: The 1992 Excavations at Tell el-'Umeiri, Tell Jalul, and Vicinity. *ADAJ* 38: 147-72.

Herr, L.G., Geraty, L.T., LaBianca, Ø.S, Younker, R.W. and Clark, D.R. 1996. Madaba Plains Project 1994: Excavations at Tell el-'Umeiri, Tell Jalul, and Vicinity. *ADAJ* 40: 63-81.

—— 1997. Madaba Plains Project 1996: Excavations at Tell al-'Umayri, Tall Jalul, and Vicinity. *ADAJ* 41: 145-67.

Younker, R.W., Gane, C.E., Gregor, P., Groves, J. and Ray, P. 2009. Preliminary Report on the 2009 Season of the Madaba Plains Project: Tall Jalūl Excavations 2009. *ADAJ* 53: 27-34.

Younker, R.W., Gane, C.E. and Shqour, R. 2007. Tall Jalul Excavations/Madaba Plains Project (MPP) *Munjazat* 8: 82-83.

Younker, R.W., Geraty, L.T., Herr, L.G. and LaBianca, Ø.S. 1993. The Joint Madaba Plains Project: A Preliminary Report of the 1992 Season, Including the Regional Survey and Excavations at Tell Jalul and Tell el-'Umeiri (June 16 to July 31, 1992). *Andrews University Seminary Studies* 31: 205-38.

Younker, R.W., Geraty, L.T., Herr, L.G., LaBianca, Ø.S. and Clark, D.R. 1996. Preliminary Report of the 1994 Season of the Madaba Plains Project: Regional Survey, Tall al-'Umayri and Tall Jalul Excavations (June 15 to July 30, 1994). *Andrews University Seminary Studies* 34: 65-92.

—— 1997. Preliminary Report of the 1996 Season of the Madaba Plains Project: Regional Survey, Tall al-'Umayri and Tall Jalul Excavations. *Andrew University Seminary Studies* 35: 227-40.

Younker, R.W. and Merling, D. 2000. Madaba Plains Project: Tall Jalul 1999. *Andrews University Seminary Studies* 38.1: 45-58.

Younker, R.W., Merling, D., Ray, P., Ziese, M., Gregor, P.Z., Gane, C.E. and Koudele, K. 2007. Preliminary Report of the 2000, 2004, and 2005 Seasons at Tall Jalul, Jordan (Madaba Plains Project). *Andrews University Seminary Studies* 45: 73-86.

Younker, R.W. and Shqour, R. 2008. Madaba Plains Project at Jalul. *Munjazat* 9: 76-78.

3. It is estimated that the cistern was built during the Persian period.