

Oriental Adventures – The excavations at Tell Halaf – Syria

A Virtual Reconstruction

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Abstract: In November 1899, spectacular archaeological finds were made near the current Syrian-Turkish border. At Tell Halaf, Max von Oppenheim discovered monumental sculptures and pictorial reliefs. They are part of an antique Aramaic palace, dating to the 10th or 9th century BC, belonging to the city-state of Guzana. An Assyrian palace was also discovered during subsequent excavations.

These were the beginnings of an excavation history, spanning over a century to the present day. A virtual reconstruction created in 2014 allows valuable insights into how the fantastic combination of architecture and art work might have looked like, as well as illustrating the dimensions of this antique town. The starting point for re-considering the architecture is the reconstruction attempts by Oppenheim's first excavation architect and long-standing employee Felix Langenegger. Today, digital equipment has become a reliable and indispensable research tool. The digitalization of Lengeneggers drawings has exposed initial inconsistencies. The present reconstruction is a continuation of earlier attempts, complemented by the most recent archaeological findings. The reconstruction was part of an exhibition in the Bundeskunsthalle, Bonn. In the coming years, it will be used as a starting point for further analyses and to assemble the isolated but diverse pieces of knowledge to create one or several possible reconstructions.

Tell Halaf is also an example of an altogether different fusion of digital knowledge. The great sculptures, which were blasted into innumerable pieces during an air raid in World War II, have been meticulously re-assembled and scanned in a 10-year research project of the 'Vorderasiatisches Museum'. Missing pieces were supplemented and fractures were three dimensionally retouched. Other items of furniture have been reconstructed using archaeological finds. This is how the three dimensional virtual model of features and finds was assembled, portraying a moment in time of the current state of research regarding Tell Halaf.

Keywords: Ancient Near East, Architecture, 3D Scanning, Sculptures, Virtual Reconstruction

Occasion and aims

In April 2014 the Bundeskunsthalle dedicated Max von Oppenheim and his excavation at Tell Halaf a large exhibition. In the focus of the exhibition were the 3000 year old sculptures, which Oppenheim was able to bring back to his home town Berlin (Fig. 1). For the exhibition the team at Darmstadt Technical University virtually reconstruct the ruins found in Syria. Here too the huge sculptures played the main role. The goal of the project was the virtual reunification of the lost architecture with the sculptures found. Also the more than 200 relief stones of the Aramaic Western-Palace were to be made visible again in their original context. Furthermore, the findings of the various excavation campaigns were virtually depicted in order to make clear

what is solid knowledge and what is derived reconstruction. At the same time, the aim was to show the actual stand of research and to check the present knowledge with the help of the digital model.

Excavation History

Tell Halaf, the ancient city of Guzana, is located in north-eastern Syria, just a few hundred meters away from the Syrian-Turkish border. As an important find spot, it was eponymous for the Late Neolithic Halaf culture in the 6th millennium B.C. in northern Mesopotamia (BECKER/NOVÁK, 2012, p. 221–233). Later on, in the 1st millennium B.C., Guzana was at first the capital of the Aramaic principality Bit-Bahiani and then the residence of an Assyrian governor.



Fig. 1 – Exhibition in the Bundeskunsthalle 2014, Bonn (Copyright Marc Grellert)

The history of excavation at Tell Halaf began in 1899 with a first investigation by Max Freiherr von Oppenheim, lasting only three days. Extensive excavations – revealing numerous monumental sculptures (Fig. 2) – took place under the direction of Oppenheim from August 1911 to October 1913 and again in spring 1929 (LANGENEGGER et al., 1950, p. 8). As it was usual at that time, up to 560 local workers were working on the excavation during peak times, under the supervision of only five architects.



Fig. 2 – Entrance of the Western-Palace during the excavation (Copyright Archiv der Max Freiherr von Oppenheim-Stiftung, Köln)

Assemblages were often divided at that time. One part of the finds was used by Oppenheim to found a museum in Aleppo that was to become the basis of today's National Museum. The remaining finds were brought to Germany. From 1930 onwards, they were presented in a private museum in Berlin-Charlottenburg. The exhibition included, amongst other objects, the famous group of figures from the entrance facade of the Western-Palace, the portrait of the giant sun god as well as Oppenheim's favourite, the "Enthroned Goddess" (Fig. 3).



Fig. 3 – Max Freiherr von Oppenheim and the “Enthroned Goddess” in the Tell Halaf-Museum in Berlin-Charlottenburg (Copyright Archiv der Max Freiherr von Oppenheim-Stiftung, Köln)

During an air raid in November 1943, the Tell Halaf Museum burned to the ground. While the exhibits made from limestone and plaster burned completely, the numerous basalt sculptures burst into thousands of small

fragments by extinguishing the fire. In 1944, at the instigation of Walter Andrae, the director of the Museum of the Ancient Near East, they were rescued and stored in the cellars of the Berlin museum island.

A restoration project – which had been thought impossible up to that point – succeeded to re-assemble numerous architectural elements and 30 sculptures out of 27,000 basalt fragments (Fig. 4) between 2002 and 2009 (CHOLIDIS/MARTIN, ed., 2010). In 2011, the reconstructed sculptures were exhibited in the Pergamon Museum, for the first time in 68 years, as part of the special exhibition “The Rescued Gods from the Palace of Tell Halaf” (CHOLIDIS/MARTIN, ed., 2011).

Parallel to the restoration project new excavations at Tell Halaf began in 2006, with the objective to get more detailed information on the prehistoric settlement and the urban structure in the Iron Age (BAGHDO et al., 2009 and 2012). However, the work was abruptly interrupted by the Syrian civil war in 2011.

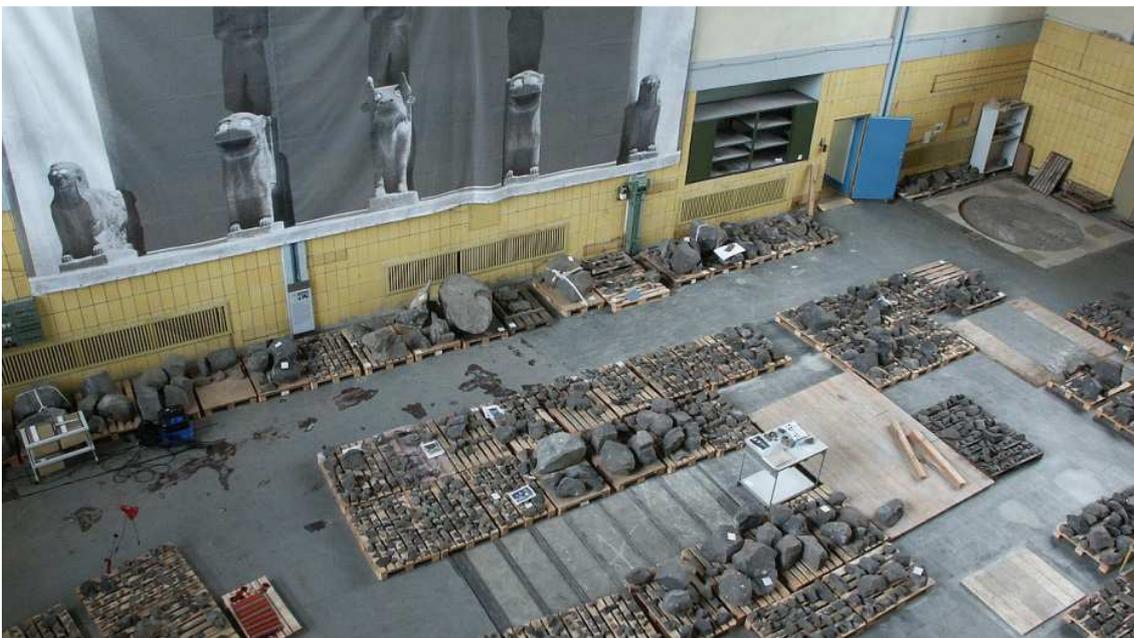


Fig. 4 – Depot of the restoration project with presorted basalt fragments (Copyright Tell Halaf-Restaurierungsprojekt, Berlin)

Archaeological Features

The entire ancient city of Guzana extended over an area of about 55 ha. It was divided into a lower town, with a size of 1000 x 600 m, and a citadel (Fig. 5). Compared to the lower town, the citadel was a lot more elevated and stretched beyond the boundaries on the northern side. A mud brick wall of 3 m thickness, which was reinforced by numerous towers, protected the city on three sides. In the north, the river Djirdjib formed a natural boundary.

The citadel was again separated from the lower town by an 8 m thick mud brick wall. Two gates led to the Citadel: The Southern Gate – certainly the most important entrance – from the lower town, and the Spring Gate, located beside the Northeastern-Palace, from the river side.

The main buildings on the citadel were the Western-Palace, built at the turn of the 10th to the 9th century B.C., which dates back to the Aramaic ruler Kapara, and the Northeastern-Palace built during the 9th century B.C. as the seat of an Assyrian governor.

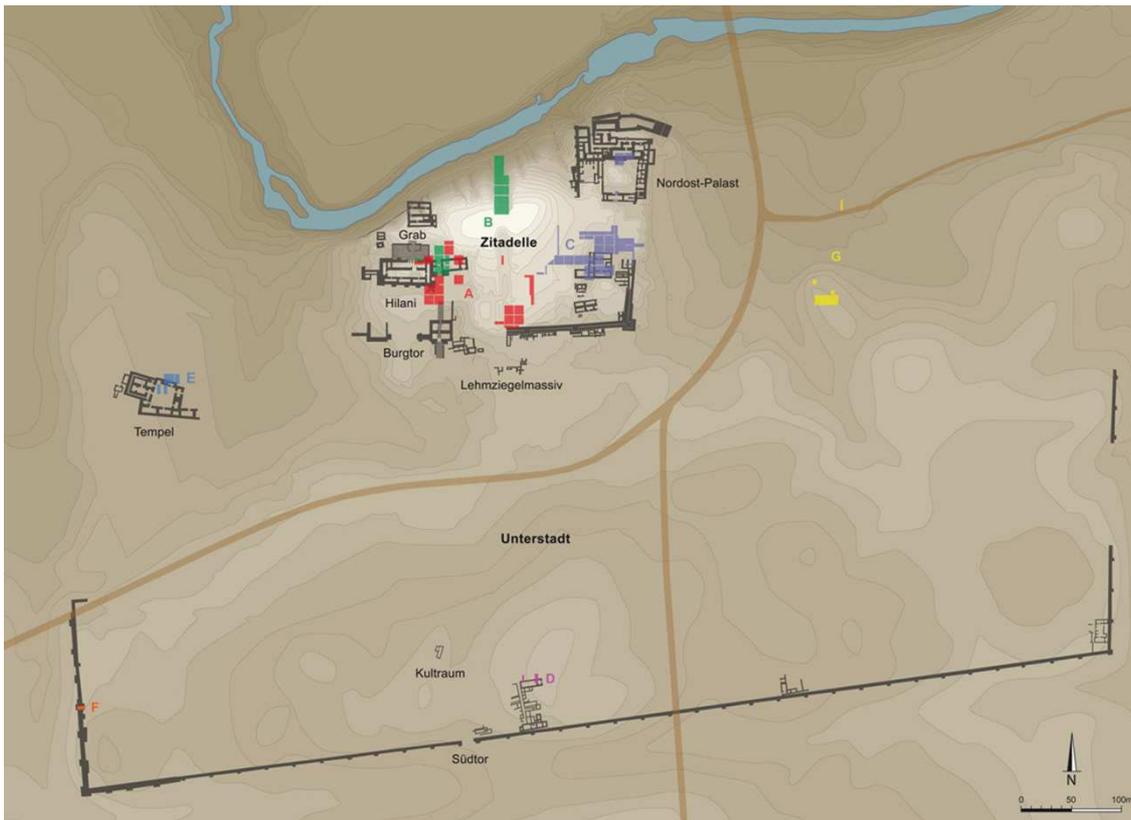


Fig. 5 – Town map with the excavated parts of Guzana. In grey the areas revealed by the Oppenheim excavation, in other colours the sectors of the new excavations 2006–2010 (Copyright Tell Halaf-Ausgrabungsprojekt, Berlin/artefacts-berlin.de)

The Western-Palace (LANGENEGGER et al., 1950, p. 23–86) with a large hall (Fig. 15), an equally long but less broad entrance hall and several adjoining rooms may be regarded as an example for the pompous orchestration of space in ancient Near Eastern architecture. From the Southern Gate, the much higher situated building was approached from the backside, where its only decoration was a series of carved orthostats on the socket of a towering mudbrick wall (Fig. 10). Only after passing the so-called Scorpions Gate, adjoining the palace in the east and after a turn of 180 degree, the magnificent entrance facade could be seen, structured by three impressive stone sculptures (Fig. 8).

The Northeastern-Palace had a floor plan typical for Neo-Assyrian palace architecture (KREPPNER/SCHMID, 2013, p. 321–325): several courtyards, hierarchized by the degree of privacy, main rooms directly adjoining the courtyards, and adjoining rooms and bathrooms at their back side (Fig. 6). However, a comparison with the typical palace scheme at the time seems to indicate that the palace has not been fully excavated, as the excavators around Oppenheim presumed. So far, only the so-called *bitanu* (KREPPNER/SCHMID, 2013, p. 39), the more private inner part of the building has been excavated, while the *babanu*, the predominantly public outer section, and the throne room connecting the two parts still slumber in secrecy.

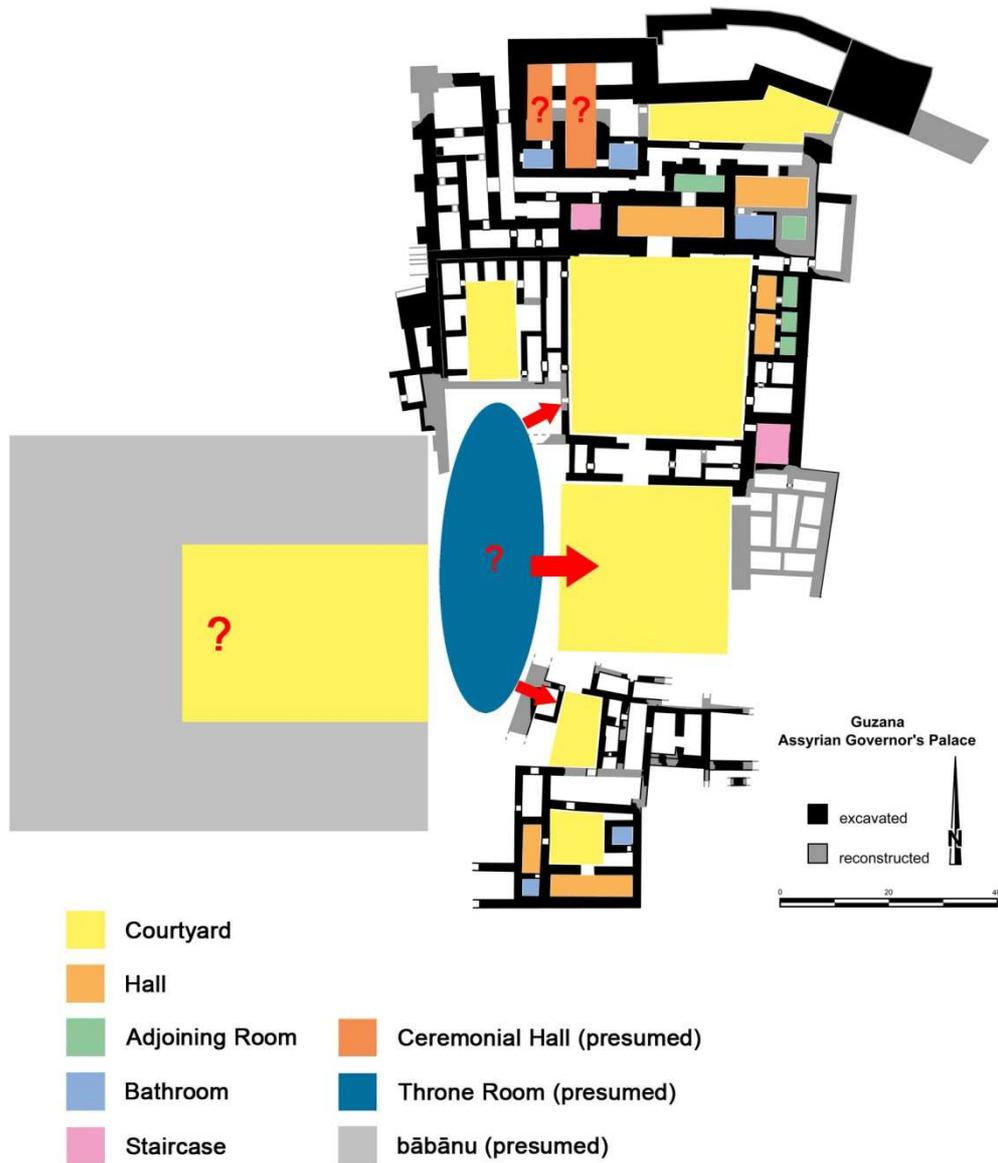


Fig. 6 – Floor plan of the Northeastern-Palace with the excavated parts in the east and the presumed parts in the west (Copyright Tell Halaf-Ausgrabungsprojekt, Berlin/Jochen Schmid)

Documentation

The documentation of the Oppenheim excavation that largely provides the basis for the reconstruction presented here primarily rests upon the first excavation architect Felix Langenegger, a scholar of Robert Koldewey, who was the excavator of Babylon and the founder of modern building research in archaeology. Langenegger followed the methods of his teacher and placed great value on architectural stone-by-stone drawings and detailed descriptions of the architectural features. Additionally to the graphic and written

documentation, Oppenheim employed an excavation photographer – a great novelty at the time –, who not only documented final states in his pictures but also work processes.

The written documentation – the find journals, the records of the excavation architects and the whole note material – is considered to have been completely destroyed during World War II. However, the book "Tell Halaf 2 – Die Bauwerke" published by Felix Langenegger, Karl Müller and Rudolf Naumann in 1950, contains very detailed descriptions of the buildings, as Langenegger intended to write a manual on building expertise for future excavations („*eine Art Baukunde für alle künftigen Grabungen*“, LANGENEGER et al., 1950, p. IV) as not many excavations had taken place in these areas („*noch wenig Ausgrabungen in jenen Gebieten stattgefunden hatten*“).

The graphic documentation looks only slightly better. All original drawings, the measurement drawings as well as the final drawings, which were made before the war, are all lost except one single plan so that today only the published print versions of the plans still exist. Of these, some show a strong distortion and consequently dimensional inaccuracies. Only Oppenheim's large photo collection has survived widely unscathed and is now owned by the Max Freiherr von Oppenheim Foundation in Cologne.

Problems Resulting from Features

Archaeological features provide the most important hints for reconstruction, as they are largely objective. This can be an architectural remain in situ, as well as collapsed fragments of walls, ceilings or installations. But, in addition to the lost parts of the documentation, the features themselves can also be problematic for the reconstruction. While Langenegger assumed that the Northeastern-Palace was a building whose "rooms are mostly grouped quite equally around two equal-sized courtyards" („*Anlagen ziemlich gleichmäßig hauptsächlich um zwei etwa gleichgroße Höfe*“, LANGENEGER et al., 1950, p. 224), already Naumann cautioned in the publication that the interpretation of the building depends on what is still buried under the rubble of the tall, and looked for parallels among Hittite and Assyrian palaces. The new excavations have now shown that the palace – taking local building traditions into account – widely follows the scheme of construction of Neo-Assyrian palaces and that it was only partly excavated. Although the Neo-Assyrian palace scheme is well known, speculations regarding the parts still hidden are omitted, and it's only indicated where they must have been, in the virtual reconstruction presented here (Fig. 7).

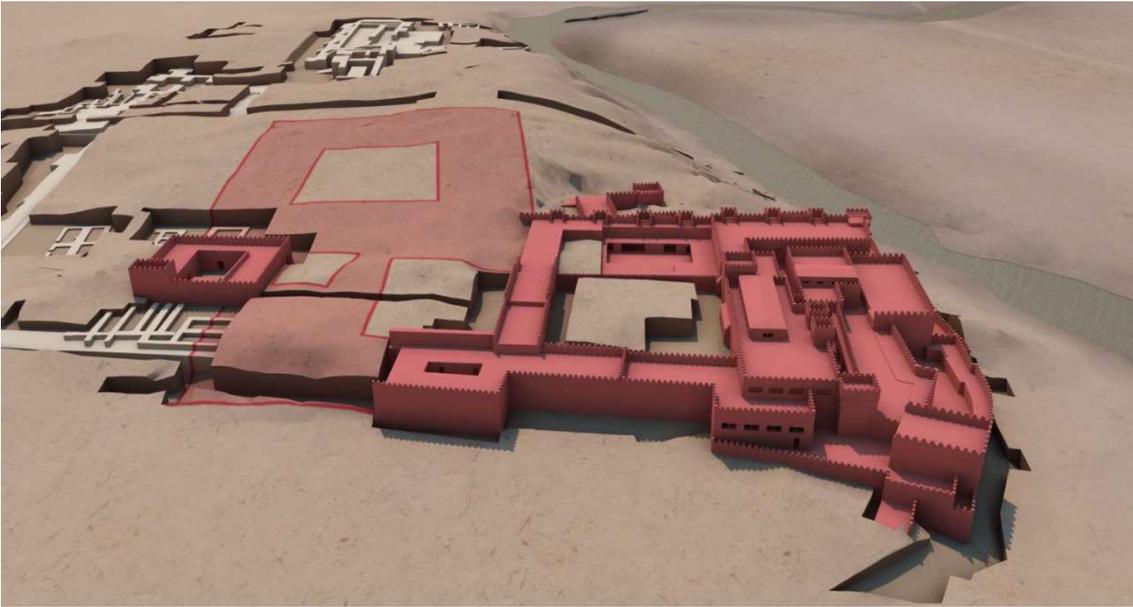


Fig. 7 – Virtual reconstruction of the Northeastern-Palace (Copyright Technische Universität Darmstadt, Fachgebiet IKA in Kooperation mit Architectura Virtualis GmbH, Kunst- und Ausstellungshalle der Bundesrepublik Deutschland, Vorderasiatisches Museum, Staatliche Museen zu Berlin)

Another problem is the entrance facade of the Western-Palace. Oppenheim reconstructed it as an ensemble of three statues of gods, standing on base animals and with high head pillars, on which the entablature of the passage rested. But, while the bases were found *in situ*, the statues lay between collapsed parts of the building, several meters away from the entrance. Additionally, the fit between bases, statues and head columns was strongly idealized in the reconstruction of Oppenheim. Therefore, the question of alternative solutions appears obvious. Several possible solutions were created for the exhibition in Bonn (Fig. 8).

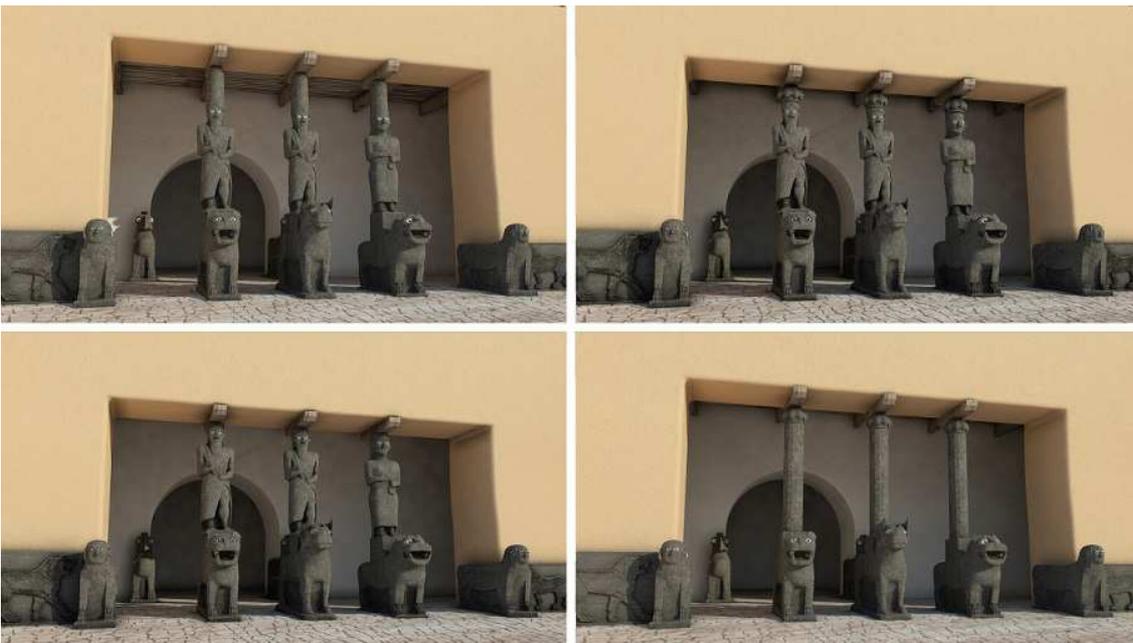


Fig. 8 – Virtual reconstruction of four possible solutions for the entrance facade of the Western-Palace (Copyright Technische Universität Darmstadt, Fachgebiet IKA in Kooperation mit Architectura Virtualis GmbH, Kunst- und Ausstellungshalle der Bundesrepublik Deutschland, Vorderasiatisches Museum, Staatliche Museen zu Berlin)

Reconstruction process

The reconstruction is based on the plans, cross sections and reconstruction drawings of Felix Langenegger. Besides the citadel with the Aramaic Western-Palace and the Assyrian Northeastern-Palace, the team at the Technical University of Darmstadt reconstructed a section of the city wall of Guzana, as well as a burial shaft with a funerary figure. The extremely short time of eight months before the opening of the exhibition was a big challenge. On the one hand, the documented state of research was to be put into the three dimensional model and, at the same time, the already new scientific results had to be considered. On the other hand, during the reconstruction process new aspects arose. They made it necessary to check the plausibility of Langenegger's reconstruction and to develop alternatives.

At first the plan material obtained looked as though it would be possible to create a coherent model. However, after combing all the material, there were many discrepancies, which caused a lot of questions. This is a principle problem of projects which up until now just have been elaborated and documented two dimensionally. In order to clear up such discrepancies, so-called catalogues of questions were sent to the scientific advisors. These catalogues show the problems by using images of the digital model. For example, there were ground plans, which didn't fit together or different formats for the windows – more square and more rectangular – or different forms of battlements. From the point of view of the scientific advisors, the most plausible solution was chosen. There were several discussions about more than 100 questions before there was an idea of how all the palaces may have looked. Off course, much is still hypothetical.



Fig. 9 – Remains of the Western-Palace in the virtual model (Copyright Technische Universität Darmstadt, Fachgebiet IKA in Kooperation mit Architectura Virtualis GmbH, Kunst- und Ausstellungshalle der Bundesrepublik Deutschland, Vorderasiatisches Museum, Staatliche Museen zu Berlin)



Fig. 10 – Virtual reconstruction of the Western-Palace (Copyright Technische Universität Darmstadt, Fachgebiet IKA in Kooperation mit Architectura Virtualis GmbH, Kunst- und Ausstellungshalle der Bundesrepublik Deutschland, Vorderasiatisches Museum, Staatliche Museen zu Berlin)

After finishing the geometry, the even edges of the walls were rounded unregularly in order to depict the character of the clay architecture more realistically. The next step was to investigate the colours and the structure of the clay. The colours were determined by using current photographs from Tell Halaf. The main focus in the reconstruction process was the virtual reunification of the reconstructed architecture and the reconstructed finds and the depiction of the features as a basis for the reconstruction (Fig. 9–10). For this various methods were used.

Archaeological remains

The drawings of the archaeological remains led to a virtual presentation of the excavation. These virtual excavation models were the basis for the reconstructed architecture (Fig. 9–10). Drawings of the excavated remains were also taken to create textures for the virtual model. For example, drawings of the floor tiles of the interior and the paving of the path to the Western-Palace were taken as a base for the texturing.

Integration of the finds

For the integration of the finds in the virtual model three procedures were used: Scanning of original objects, creation of virtual models by using photographs of the original objects and modelling virtual 3D objects based on already existing two dimensional reconstruction drawings.

Scanning of original objects

A first procedure was the scanning of original objects and the compensation of missing parts (Fig. 11). Due to the short period of time for this project, it was necessary to scan the sculptures very quickly in the storage

room. The goal was to reconstruct the sculptures and to show them in their possible original state. Missing parts and cracks had to be compensated and the impression of the original material – basalt – had to be conveyed. To handle the huge amount of data of the scans, the geometry was simplified. Not all of scanned sculptures were totally virtually completed because of the amount of time needed to complete this task. For the griffins a relief field could not be reconstructed in the model, but an already existing reconstruction drawing was integrated into the virtual model.

Using photographs of the original objects

The three dimensional presentation of the orthostats were based on photographs. The individual photographs were cropped and photoshopped and mapped on virtual stone blocks. After this the reliefs were simulated by the computer (Fig. 12). There is an extensive collection of historic photographs, which included those of orthostats where the originals are not accessible today or even no longer exist.



Fig. 11 – Wire frame of a scanned sculpture in front of the main entrance of the Western-Palace (Copyright Technische Universität Darmstadt, Fachgebiet IKA in Kooperation mit Architectura Virtualis GmbH, Kunst- und Ausstellungshalle der Bundesrepublik Deutschland, Vorderasiatisches Museum, Staatliche Museen zu Berlin)

Virtual 3D objects based on already existing two dimensional reconstruction drawings

A last procedure was the creation of virtual 3D objects based on already existing two dimensional reconstruction drawings of finds. For example, the so-called fire wagon – a type of mobile heating, where remains were excavated and drawings of the reconstruction were published (Fig. 13–15).



Fig. 12 – Virtual reconstruction of an orthostat of the Western-Palace (Copyright Technische Universität Darmstadt, Fachgebiet IKA in Kooperation mit Architectura Virtualis GmbH, Kunst- und Ausstellungshalle der Bundesrepublik Deutschland, Vorderasiatisches Museum, Staatliche Museen zu Berlin)

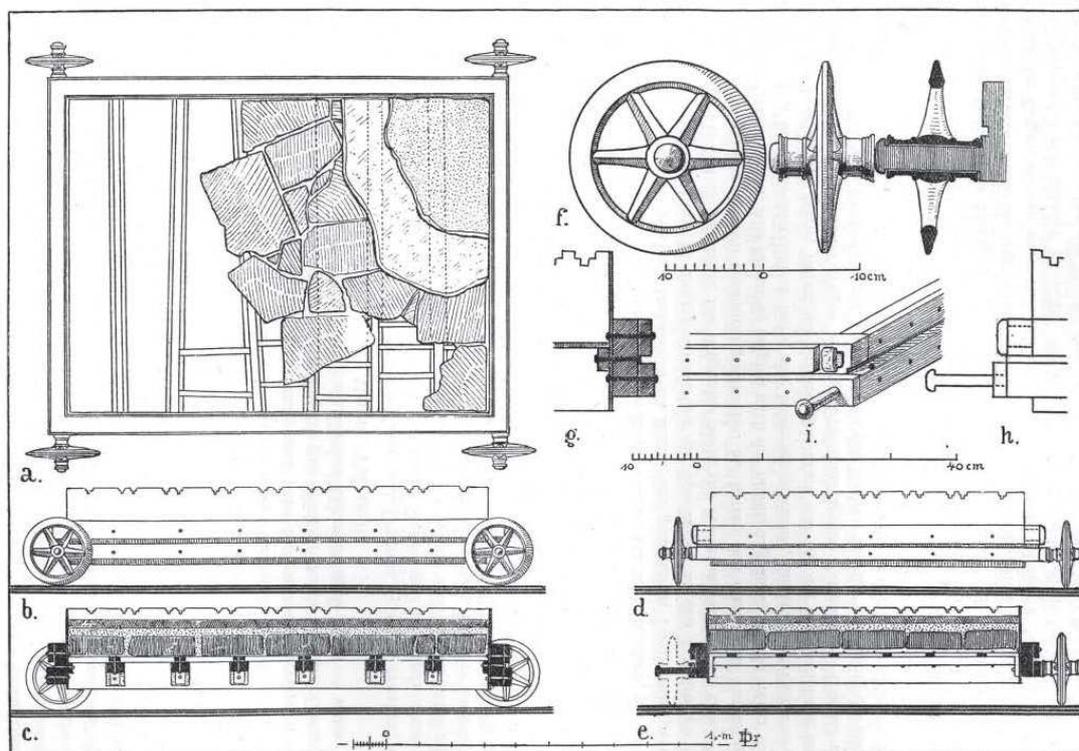


Fig. 13 – Reconstruction drawings of the fire wagon (copyright LANGENEGGER et al., 1950, p. 46, Abb. 14)



Fig. 14 – Virtual reconstruction of the fire wagon (Copyright Technische Universität Darmstadt, Fachgebiet IKA in Kooperation mit Architectura Virtualis GmbH, Kunst- und Ausstellungshalle der Bundesrepublik Deutschland, Vorderasiatisches Museum, Staatliche Museen zu Berlin)



Fig. 15 – Virtual reconstruction of the main inner hall of the Western-Palace with the fire wagon (Copyright Technische Universität Darmstadt, Fachgebiet IKA in Kooperation mit Architectura Virtualis GmbH, Kunst- und Ausstellungshalle der Bundesrepublik Deutschland, Vorderasiatisches Museum, Staatliche Museen zu Berlin)

Conclusion

For building research, virtual reconstructions provide not only an opportunity to present their results to a wider audience, especially in the light of the increasing importance of public relations, but they also offer the opportunity to check observations, considerations and resulting conclusions and questions with the help of the created model. However, we should not forget that a building, which is only preserved as an

archaeological feature, never allows an unambiguous reconstruction, especially not in its elevation. A virtual reconstruction therefore hardly reflects the exact past appearance. It can only try to capture the nature of a building and develop a plausible picture in the light of all available facts.

Finally, one has to mention the current situation in Syria. For more than three and a half years a ruthless civil war is raging in this country, a humanitarian disaster with thousands of people dead and millions made refugees. But it is not only human suffering that makes this war so terrible but also the demolition of a unique cultural heritage (NOVÁK, 2014). For example, large parts of the Old City of Aleppo – one of six UNESCO World Heritage sites in Syria – are largely destroyed now. Important ruins such as Apameia on the Orontes or Dura Europos on the Euphrates got systematically looted. But with each destruction and with each looting, a piece of the history and the cultural identity of Syria fades.

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