Conservation of the Mosque of Shajar al-Durr
Report on Phase I

May al-Ibrashy

Introduction

This founder of this building is 'Ismat al-Dawla Shajar al-Durr, the only female to rule Egypt in the Islamic period. She ruled as Sultana for 80 days and had coins minted in her name. As the Mamluk wife of the last Ayyubid Sultan, then Sultana, then the wife of the first Mamluk Sultan, her reign lies at the transition from the Ayyubid to the Mamluk Era. The mausoleum was built in 684|1250, the year that marks the end of one era and the start of the other. The choice of location is also noteworthy. Shajar al-Durr chose not to be buried in the Qasaba (currently al-Mu'izz Street) and the location of choice for her husband's mausoleum. Instead, she picked a location in al-Mashahid (currently al-Khalifa St.) possibly because of its proximity to important shrines to female religious figures such as al-Sayyida Nafisa, al-Sayyida Ruqayya, al-Sayyida 'Atika and al-Sayyida Sukayna, all descendants of the prophet Muhammad. In a further twist, her mausoleum came to be known as al-Khalifa in the Ottoman period. This was after a second cenotaph, said to belong to 'Abbasid Caliph Muhammad al-Khalifa appeared in the dome. While this second figure cannot be historically authenticated, it became accepted locally as a more important burial than Shajar al-Durr to the point that not only the shrine, but the whole street came to be named after it and after the residence of the 'Abbasid Caliphs located south of the mausoleum. In 1243/1876, a mosque was built north of the shrine and named al-Khalifa. It was renovated in the mid-19th century and demolished by the *Comite de Conservation des Monuments d'Art Arabe* in the early 20th century. By order of Sultan Husayn Kamil (1914-17), it was replaced by a second mosque built at a distance of 1.5 M from the dome. Construction of this mosque started in the 1920s and was never finished. It was used as a community centre and clinic only to be closed sometime in the early 2000s.

This evocative history with its inextricable link to the history of the street as a whole ties into the wider scope of our initiative, al-Athar Lina (The Monument is Ours). In this initiative, we involve stakeholders, particularly residents, in conservation and development activities to transform heritage into a communal resource that society benefits from and thus preserves. This conservation project became a nucleus for a much wider intervention that includes the rehabilitation of the adjacent mosque into a community centre and the conservation of the Fatimid domes opposite Shajar al-Durr with funding from the Ambassador's Fund for Cultural Preservation. We also implement a social and cultural program in collaboration with the Built Environment Collective (Megawra) that in 2015 includes an educational and public health program targeting the children of the neighbourhood, a participatory research program on the waste management process in the street, a capacity building program called al-Khalifa Exchange in which artisans from the street exchange knowhow and skills with designers, and finally, a tourist promotion program whose annual manifestation (Spend the Day in Khalifa)

brings together residents and visitors in a celebration of the street's past and living heritage.

The mausoleum's architecture and decorative features were an even more important factor in its choice for conservation. The dome consists of a square shaped chamber of an internal area of c. 50 sq. M with brick masonry walls topped by a keel-shaped dome pierced by 8 windows. The transitional zone consists of two tiers of squinches with interstitial tri-partite octagonal windows. The dome contains a number of unique features that were at risk from neglect and poor maintenance:

1. Its glass mosaic *mihrab*, the only intact example of its kind in Cairo. It has as its central motif a tree of pearls, in clear reference to Shajar al-Durr's name.
2. The traces of painted polychromy, both vegetal and geometric, that could be seen on the interior of the dome in the transitional area and between the windows. These patterns are referred to in earlier sources but there is no record of their conservation or documentation.
3. The carved stucco decoration, particularly that on the interior walls above the *mihrab* and the three doors. Its intricate style is typical of the period and while it is not unique, it is an excellent example of its genre and fairly well preserved.
4. The foundational frieze of painted wood in which Shajar al-Durr is named as the founder and described as the Sultana, mother of Khalil.
5. The lower wooden frieze that is a reused Fatimid frieze with Kufic inscription, and as such, an important part of this genre, possibly taken from the same source as the friezes discovered in the *madrasa* of al-Salih Najm al-Din Ayyub in al-Nahhasin.

Another reason for the choice of this mausoleum for conservation is its poor state of preservation. While structurally sound, most of the factors placing it at risk are a product of its recent history, as recent as the last 20 years.

1. Very limited information is known of the conservation project dating from the 1990s and its subsequent phase dating from the early 2000s but its effect can be seen on the building. In the course of this project, the walls and dome were plastered with a thick layer of cement. This cement accelerated the damage caused by rising damp, contributing its own brand of alkaline salts to the existing salt content and preventing the release of the water content through evaporation. The result was salt damage to the masonry and the disintegration of the mortar. Further damage was caused by cement splatter on the both the carved and painted stucco and on the upper foundational frieze.
2. The second phase of the project seemed to have attempted to restore the polychrome decoration on the transitional zone. While this attempt was mercifully aborted, this was not before they had hacked at the surface of a number of decorated panels in a crude attempt to uncover the design and removed two units and replaced them with a garish replica in white and green modern paint.

A consequent development also related to the history of mismanagement of the site was the appearance of a garbage collection point in front of the monument. This phenomenon is common

to almost all the listed monuments in the street and is a reflection of its "ownerless" status within the dynamics of the street. Disused monuments rank almost as low as deserted lots in the hierarchy of the street's spaces and as such are ideal spots for garbage collection. The result was the accumulation of mounds of garbage that overflow within the buffer zone of Shajar al-Durr adding a third type of salt to that rising from the sub-surface water and that emitted by the cement plaster.

Scope of Work

The scope of work as defined in the proposal submitted to the American Research Centre in Egypt's Antiquities Endowment Fund and to the Barakat Trust was as follows:

1. Remove rubbish mounds that have built up over the years and conduct photography and architectural documentation and condition survey
2. Conduct restoration of the mausoleum interior and exterior including desalination, crack repair, grouting and removal of cement mortar
3. Repair the dome, doors, windows and wiring on the upper windows
4. Design and repair fence surrounding the monument
5. Conservation and restoration of missing wood panels, glass mosaic *mihrab*, carved stucco and internal / external stone tiles
6. Post-conservation documentation

Adjustments to the Scope of Work After Detailed Examination and Preliminary Tests

Preliminary investigation of the site had indicated that the items of work stated above were all that was necessary for a comprehensive conservation project. The conservation activities, funded by ARCE-AEF with additional funding from the Barakat Trust, started in in November 2013 and ended in October 2014. After permissions were obtained for implementation, it became possible to examine the building more closely and additional issues came to light:

1. Examination of the polychromy yielded observations that were both exciting and daunting. The 8 medallions between the dome windows were almost intact but they were not covered with deposits as assumed. They had been coated with a layer of plaster of a thickness of 1-3 mm probably added in the 19th century. Preliminary tests indicated that the paint immediately below that plaster was extremely friable and needed to be consolidated first before the plaster could be removed mechanically using scalpels. Needless to say, this would prove to be a very delicate and time consuming process. It was found that the squinches and panels of the transitional zone were coated with the same layer of plaster although they were in a worse state of conservation. The northern and western corners were better preserved with what seemed like 50 % of their decoration remaining, while only 25% remained of the decoration of the southern and eastern corners. This was in addition to the cement splatter and mechanical damage from the previous conservation project.

2. The upper inscription frieze was found to be in a worse state than anticipated. Much of what was thought to be grime turned out to be a coating of cement applied by mistake during the previous conservation project. It was found that 90% of the southeastern side, 90% of the northeastern side, 40% of the northwestern side and 50% of the southwestern side was coated with cement. Removing it would prove to be much more complicated than removing the gypsum-based plaster coating the medallions as the painted inscription underneath was loose and the cement had adhered to it. Tests indicated that in reattaching the paint to the wood substrate we also added to the adhesive strength of the cement but this was unavoidable. We then attempted to mechanically remove the plaster using scalpels and with as little loss as possible of the original paint.
3. The carved stucco was also coated with cement plaster. This was most severe on the southeastern and the southwestern panels. Again the only way of removing it was mechanically using scalpels, a process that took five as much time as the process of cleaning the stucco that was only coated with deposits.
4. Traces of inscriptions were found on the tie beam facing the *mihrab*.

These observations led to a realization that the time and budget estimated for the work would not be sufficient. It was felt that in addition to the implementation of basic works, priority should be given to uncovering and retouching a section of the polychromy because of its high art-historical value and as a pilot for the full project. The Ayyubid period has limited examples of painted polychromy on the interiors of domes. That of the mausoleum of the Abbasid Caliphs was recorded by Creswell in the *Muslim Architecture of Egypt*. A second example, in the mausoleum of al-Salih Najm al-Din Ayyub was uncovered and studied by Hampikian in the course of the conservation project carried out by the German Institute of Archaeology in the early 1990s. This example has never been documented properly.

A second development led to the need to postpone another section of the project. A new mosque is planned to be constructed west of the mausolea of al-Sayyida Ruqayya, al-Ja'fari and 'Atika at a distance of around 40 M from the dome of Shajar al-Durr. This construction of this mosque, which covers an area of around 2000 M^2, will probably entail a temporary dewatering of the ground until the foundations are dug. Luckily, the dome will not be structurally affected by the dewatering but it could suffer from minor subsidence that may result in the appearance of micro-fissures particularly in the plaster. It could also result in the reactivation of the salt cycle thus undermining the desalting operation that was part of our project. This led to the decision to remove the plaster in the areas of damp, desalt, put crack monitors on places of structural vulnerability and postpone the final plaster work till after the foundation phase of the modern mosque, which is planned to take place between January and June of 2015.
The decision was also made not to work on the glass mosaic *mihrab*. Concerns were voiced by the Ministry of Antiquities' Permanent Committee about the need to work on it particularly that it had been completely redone in the course of the previous conservation project. Close examination showed that the work done was irreversible and that while visually unpleasant in places had left the *mihrab* in good structural condition and the

mosaic well attached.

The decision was to reschedule the project over two phases in the following manner:
Phase 1 (November 2013 – November 2014)

1. Documentation and condition survey: This included a comprehensive architectural documentation, documentation of all the decorative details, photo and video documentation of before, during and after conservation and a thorough condition survey indicating construction material and building phases in addition to a mapping of damage that included cracks and mechanical deformation, discolouration and deposits and biological damage.
2. Masonry repair: Cement mortar was removed up to a level of around 2.00 M above floor level on the exterior and up to the level of the lower wooden frieze on the interior. A decision was made to remove the plaster only up to the level threatened with damp from capillary because the cement plaster was found to be extremely thick and dense. Subjecting all the building to the impact damage caused by breaking the mortar was more detrimental than leaving the cement plaster at the upper sections. The lower section were then desalted using paper pulp, then lime mortar poultices. The walls were then grouted using lime mortar with brick dust as an additive and stone powder and fine sand as aggregate. Cracks were opened and repaired using lime mortar and linen thread. Damaged and missing brick was replaced.
3. Removal of garbage and masonry repair of walls of buffer zone and repair of iron fence: The garbage was removed and the garbage collection point was moved across the street after negotiation with the neighbourhood and the municipality. The health and educational activities we had started to organize in the adjacent building strengthened our position, the argument being that the presence of garbage was incompatible with the new function. This was in keeping with our premise at Athar Lina that only when heritage becomes useful will the community start to take responsibility for its preservation. All the walls surrounding the buffer zone were grouted, damaged brick and stone was exchanged or repaired, neighbouring sources of leaking water were repaired, the iron fence was fixed and the walls cleaned.
4. Repair of the dome interior: The sections of the plaster that had come loose from the brick masonry dome were fixed through grouting. Paper pulp poultices with ammonium carbonate at a concentration of 10% were used to clean the plaster.
5. Conservation of the painted polychrome on the interior of the drum and the transitional zone: After fixing the loose sections and flaking surfaces of all the area, the northern corner was conserved in full through the following steps:
    a. Consolidation of the surface by spraying Paraloid B72 dissolved in acetone at 5%.
    b. Preliminary dry cleaning using soft brushes, then wet cleaning using acetone in order to make the paint under the 19th century plaster more visible.
    c. Removing the plaster using scalpels.
    d. Plaster repair of the missing substrate using a lime mortar with stone powder aggregate and PVA additive.

e. Application of a protective dammar resin coating.
f. Retouching the design in lacunae or in places where traces of the preparation layer are still present using stippling.

6. Conservation of the carved stucco hoods crowning the *mihrab* and the three entrance doors. Loose sections were refixed, cavities were grouted and cracks were repaired using gypsum and linen thread for tensile strength. The stucco was cleaned using compressed air, then deposits were removed using a combination of mechanical cleaning using scalpels and chemical cleaning using ammonium carbonate compresses. Cement deposits were removed mechanically. Missing sections of the vegetal decoration were restored only where there was proof of the original design. In the case of the Quranic verses running along the borders, the script was restored in the places where it was possible to deduce both the start and end of the text. The vegetal patterns in the background were not restored. This decision was made out of respect to the religious need to restore the Quranic script with care taken to avoid speculation and to visually differentiate between the old and the new.
7. Conservation of painted wood: The loose sections of the painted inscription were re-fixed to the wood substrate by pressing them down using heat resistant paper and applying gentle heat. The paint was then consolidated by spraying it with PVA dissolved in water at 2%. It was then cleaned using with acetic acid dissolved in water at 10% and cement deposits were removed mechanically using scalpels. The wood was treated with insecticide and all the cavities were filled using sawdust in the smaller sections and balsa wood in the bigger sections. A protective coating of dammar was then applied.
8. Conservation of the carved Fatimid panels: These panels were in relatively good condition. In the course of removing later plaster additions from them, the Comité de Conservation seemed to have stripped them of their original colours as well. So all that needed to be done was to remove the dirt by dry brushing then swabbing with acetone then apply a protective layer of dammar resin. The wood was treated with insecticide and the cavities were filled. The missing panels were replaced using plain panels of ‘Azizi wood of the same sections. These was to preserve the visual integrity of the interior and also to provide support for the stucco panels above, all of which had vertical cracks that must have developed after the wood bracketing them had been lost.

Carpentry work: The windows in the drum of the dome were repaired and netting was refixed. Minor repairs were carried out on the doors.

Future Plans

Phase II (planned for 2015 – funding still pending) will include the following items of work:

1. Uncovering and retouching the remaining sections of the polychrome decoration on the interior of the drum and transitional zone.
2. Repair of plaster and cleaning and repointing of unplastered northwestern external wall.

3. Tilework includes replacement of damaged tiles and steps, repointing of joints and cleaning.
4. Introduction of information panels and external lighting.
5. Continue negotiation with the Ministry of Antiquities concerning the adaptive reuse of the site. The preliminary proposal to use it as an exhibition space was rejected but it is hoped that with the inclusion of the domes of al-Sayyida Ruqayya, Ja'fari and 'Atika in the project and the government's plans for the construction of the new mosque this position may change.

One unexpected and highly gratifying result of our prolonged presence in the street is that it gives us time to study the street more, interact with its people, and experiment with the developmental component of our project involving more stakeholders in both planning and implementation. We are also at hand to lobby the government for change, intervene in their plans for the benefit of the neighbourhood and provide technical support if needed. It is hoped that this new experimental, holistic and participatory approach will result in buildings that continue to be taken care of after we leave and in heritage that belongs to all and is useful and meaningful to all.

Cairo, 2015

Selected Readings

Al-Athar Lina, *Whose Monument? Participatory Design Project on the Relationship of al-Khalifa Street's Monuments to their Surroundings* (2012) (www.atharlina.com)

K.A.C. Creswell, Muslim Architecture of Egypt (New York, 1978)

Comite de Conservation des Monuments d'Art Arabe, *Exercice 1882-83 : 1954-61* (1892 – 1963) (www.islamic-art.org)

N. Hampikian, *Al-Salihiyya Complex through Time* (Cairo, 2005)

N. Mackenzie, *Ayyubid Cairo: A Topographical Study* (Cairo, 1992)