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## A REVIVAL OF THE AQUEDUCT OF OLD CAIRO ‘MAGRA AL AYOUN’

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### **Abstract**

*The Aqueduct of old Cairo, “Magra Al Ayoun” is a major medieval water work in old Cairo. one of the most prominent historical Islamic monuments in Cairo, because of its historical and geographical value since its establishment during the reign of Sultan Nasser Saladin, the founder of the Ayyubid state in Egypt who took power from 565 Ah / 1169 AD to 589 Ah / 1193 AD. It was neglected over the past 100 years by Egypt's rulers. Consequently, the aqueduct was exposed to natural deterioration and human encroachments. The valorization of the Aqueduct could greatly contribute to the enhancement of the old city fabric. The aqueduct could also constitute a major site for tourist development, because of its linear shape that allows crossing to an important part of the Old City. The Governorate of Cairo works in coordination with the Ministry of Tourism and Antiquities permanently to develop this area to revive this monument, after this area was subjected to major infringements and irregularities, where the place was surrounded by waste and animal pens, so the project works on the restoration of the parts that were demolished and revive the drivers through laser lighting and the establishment of gardens, restaurants, and shops of handicrafts in addition to halls of cultural performances and heritage concerts, in order to represent this area a new addition to the tourist and cultural places in the capital. This paper aims to shed light on the huge project of revival of Aqueduct.*

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### **Keywords**

*Aqueduct, Water, Citadel, Revival, Heritage, Monument.*

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## **Introduction**

The wall was created to transfer water through a water channel to raise it from one of the wells near the citadel, which was the seat of government in the era of the Ayyubid state until it delivers water to the citadel, and then use this fence to transport water from the Nile through the market to the citadel until it reaches a set of huge wells inside the citadel.

The wheels are one of the most effective ways to lift water from the Nile, while gulfs and wells are used in irrigation and drinking. We also have to point out other ways of water levitation in Egypt that were very simple. Sweeps, shadof, and water wheels were used to lift water for more than three meters high. The water wheel consists of a wooden wheel with a 2.5 width surrounded with bashes, 20 cm length, centered vertically, and is detained to the ground above a wooden piece set consecutively above each other connected with a levitator 3 meters high.

The center of the water wheel is made of a tree and extended into two branches to make it easy for the vertical levitator. In the Mamluk era, Egypt's lands were called wheels. Al Maqrizi mentioned that there was a lot of land and wheels; including a big wheel around 360 acres specialized in cane and grapes at Ethna. (Nawar1999, p. 101-104). There was another type of wheel known as the ark that differs from the others, as it consists of wooden drawers set in the main wheel instead of ropes and is used in the ground with the nearest water source.

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The size of the main wheel differs depending on the number of drawers. (Nawar1999, p. 101-104). The wheels levitating water from the Nile were called the nautical wheels and others transferring water from level to level were called the transportable wheels. The wheels were run by special cows dedicated for that purpose. There was a man who was in charge of overseeing the waterwheels, serving the cows, and installing and fixing the water wheels (Nawar1999, p. 101-104).

The aqueducts in general consist of an intact tower which consists of water wheels that elevate water from deep down to a higher place then pour water on the surface of this tower to run into a tunnel which is carried by pointed arches to reach its source of access. (Azab2011, p. 92).



Fig (1, 2) Aqueduct of old Cairo, “Magra Al Ayoun” Source SCA

### **Supplying the Citadel with Water:**

The citadel was supplied with water in two important ways: – First, by Joseph Well. It was drilled by Saladin but it was not sufficient due to the growing needs of the residents of the citadel. Accordingly, he decided to deepen the well in order to increase the amount of water but this lead to an increase in the salinity of the water. This well consists of two superimposed

wells over each other in order to raise the water to the citadel by wheels. The depth of the well is 40.3 meters that were cut into the rock. (Azab2011, p96-97). – Second, by the aqueducts which were found in the wall of the Citadel. They were initiated by Saladin and completed by El Kamel in 635AH (1254AD) to connect old Cairo with Fustat.

The water is transported underneath the citadel by pottery (clay?) water pipes in the wall. El Kamel used the same idea of the aqueduct of Ahmed Ibn Tulun in transporting the water although the length of Saladin wall is longer than that of Ahmed Ibn Tulun.

In 712 AH Al-Sultan El Nasir Mohamed Ibn Qalauon constructed an intake tower with four water wheels on the river Nile to transport water from the river Nile to the wall and then to the citadel. Then in 728 AH (1327AD), he wanted to increase the amount of water so he made another canal from Helwan to the red hill to transport water from the square to the citadel, however, this idea fell through. (Creswell 1952, p256). Then in 741AH (1340AD), El Nasir Mohamed Ibn Qalauon got another idea for increasing the amount of water to use for all purposes in the citadel. The long arches which were carried from the Nile and passed under the enclosure of the observatory (this was on the high ground south of old Cairo, which slopes away gradually on the east side and terminates on the west by a steep cliff) to the citadel. They arrived thus at ravage so he ordered another well to be dug which had connected arches that joined the ancient aqueduct. At this time there was a supplementary intake tower and the Aqueduct (Creswell1952, p 256).



**Fig (3) Intake Tower, source SCA**

In 812AH (1409AD) the aqueduct was restored by Yelbogha El Salamy. It was also restored in 845AH /1444AD by Gakmk. (Maher1958, p139) In (872-901AH) (1468-1496AD), Al-sultan El Ashraf Abou El Nasr Qaitbay made some restorations and added pointed arches to connect the Aqueduct with the ancient one of Saladin, and registered his name upon it in

880AH. (Madiha2004, p60) In (906-922AH) (1500-1516AD) Sultan EL Ghouri demolished the intake tower that was made by Sultan El Nasir Mohamed Ibn Qalauon because of water leakage. He built a new intake tower and arches which joined the wall of Saladin to the Citadel (Madiha2004, p60) none of the historians can confirm an actual date for the restorations made during the reign of El Ghouri.

Casanova states that the exact date of building the Aqueduct is in (911AH) (1505AD), while Jomard states that the date of building it is (912-914AH) (1506-1508AD). Creswell agrees with Jomard on the opinion of Ibn Iyas that El Ghouri finished the work on the old Aqueduct built by Al sultan El Nasir Mohamed Ibn Qalauon and began building a new one. (Creswell 1952, p. 256), (Madiha2004, p92) During the Ottoman period Abadi pasha made some repairs and buttresses in 1129AH. This does not match with Creswell as he said that Abadi Pasha made these repairs in 1139AH / 11727AD (Creswell 1952, p256). There are two medallions in the Islamic Art Museum registered on it the name and date of Abadi Pasha (Madiha 2004, p93) The French expedition came to Egypt in 1213-1215AH / 1798-1800AD, which many changes to the Aqueduct were made as Gabarti stated that they blocked many parts in the arches of the Aqueduct to use it as a shelter during their wars.

According to Wittman the Aqueduct was out of use and stopped working by the end of the 18th century (Madiha 2004). According to Al Gabarti, some arches of the Aqueduct had fallen and were damaged until Mohamed ALI Pasha ordered some restorations and repairs and took a water branch to reach the cemetery in 1289AH/1892AD (SAMI1999, p. 17 Figures 2-2 91). The aqueduct stopped functioning later from 1287AH/1872AD when Cairo was provided with a new modern water supply system. (Madiha 2004). Sultan Mohammed bin Qalawun completely renovated the wall in 1312 in two phases by establishing four drivers on the banks of the Nile in the Gulf Mouth region, and in the era of Sultan, Al-Ghuri ordered the establishment of six markets located near the area of Sayyida Nafisa, in order to strengthen the water stream that reaches the wells of the citadel.





Fig (4) Current Situation

### Components of the Aqueduct:

The Aqueduct consists of three main parts:

- 1- Intake Tower: it is a hexagonal intake tower situated at Fumm Al Khalig’s (The Mouth of the Canal) hippodrome, with six waterwheels pulled by oxen causing the water to rise in a channel resting on a basin, then gushing out in a water canal that heads to the Citadel.
- 2- Irrigation Arches: they are pointed arches directed eastward with 2.2km stretching from the Hippodrome till it reaches Salah Salem Street.
- 3- Irrigation Channel: it begins from the tall piers of masonry reaching the irrigation arches and meets at Saladin's wall.

### Previous Situation:

The inhabitants of the area appropriated parts of the aqueduct's wall, building houses and workshops within it. Some of its surroundings, like the tanneries that are located in the area, produced chemicals that ate away at the aqueduct's stone. The problem of the monument did not appear suddenly but it started seriously after the earthquake of 1992. It then started to increase, but even after the restoration, which started in 2000 (Al Ahram 2000), did not finish, although the construction company has finished its work. The area of the Aqueduct and the monument itself lacks all measures of management although it is one of the unique monuments in Egypt.

It was written in El Ahram newspaper on 22/3/2013 that the Aqueduct will be in the Itineraries of the touring program during their visit. But during my field-work and observation, this did not happen because of the mismanagement of the place. The only thing which the construction company had done is the restoration of the monument but it is not prepared or opened for the visit.

Most of the Egyptian tanneries are located in Misr al Kadima district (old Cairo), also known as the tanner's District' (Sour Magra Al Ayoun), in the south of Cairo. The tanneries that are located in this area are suffering from a cycle of pollution in addition to the very poor state of their infrastructures and the use of obsolete machinery without almost any clean technologies being implemented. They suffer from deficiencies in the state of the buildings and the electrical and hydraulic facilities, as well as the unorganized distribution of the production process and an insufficient state of order and cleanliness that affects the quality of the final product. They consist of one or several buildings that have various stores where different activities take place on different floors and there is a lack of proper lighting and healthy conditions. The tanneries carry out: beam house (what is this?), tanning, dyeing, and finishing processes. The most used leathers are bovine leathers and buffalo hides, small and large in size, in addition to other types of leather such as caprine.

The tanner uses a series of chemical products and water. As a result, liquid waste is produced that carries the leather's organic matter and remains of chemical products. In addition, there is the solid waste from the mechanical operations and emissions into the atmosphere (solvents from finished products, gases from the combustion in the boilers).

They use water from the local network that leads to the deterioration of the local sewage system. The workers do not receive any type of environmental training. The number of registered tanneries is 486 tanneries, 129 glue factories, 151 leather factories, and 92 chemist shops. The total area covers 70 acres, 90% of which is owned by the Cairo government, and contains 10, 00 to 12, 000 workmen there. (Egyptian Ministry of Trade and Industry (MTI)) They will be relocated to the industrial zone called El Robaiky in Badr City, which is 50km away from Cairo. The objective of this plan is to establish an industrial zone for the Egyptian tanneries that will represent the latest and best technologies available to the sector, as well as different measurements of improving the industrial, social, environmental, and economic levels. However, most of the owners of the tanneries and the workmen refused to move, as it is a very far place from their homes. (Ministry of Industry and Foreign Trade).

**A revival of the Aqueduct of old Cairo, “Magra Al Ayoun”:**

An integrated project to develop the Aqueduct of old Cairo, “Magra Al Ayoun and the surrounding area is adopted by the Cultural Coordination Authority in partnership with the Governorate of Cairo, the Antiquities Authority, and the Ministry of Tourism. The aim is to restore the wall as the oldest historical wall and place it on the world tourism map. The Aqueduct of old Cairo, “Magra Al Ayoun has been in existence for more than 500 years. The government is working on a harmonious system for the development of the fence because the infringements are large and the irregularities are increasing day by day. The project includes the restoration of the dilapidated parts, the revival of laser lighting fences, the construction of suspended gardens, restrooms, and bridges, as well as a marina on the Nile connecting it to other tourist areas.

Over the past years, the wall of the eye stream has been transformed into a garbage dump and animal pens and is nowhere it is on the tourist map. For years, the Supreme Council of Antiquities has restored it at a cost of several million pounds, but the hand of neglect extended to it again until the device adopted a project to restore the wall to its first biography. The mounds of garbage and debris had to be removed from both sides of the fence but soon returned. before, the project took on a new dimension of the need to upgrade the area around the fence in order to be the real line of defense to protect the fence from pollutants and attack it.



**Fig (5) Master plan for the project of biology and development**

The project aims to transform the area into a tourist and cultural area by establishing handicraft shops and leather products, as well as restaurants and cafés, and owning it for the residents of the area, which will also include halls for cultural performances and concerts. A special security department will maintain security with the allocation of a clean-up department in which the population participates. The development will include the beginning of the wall on the Nile, where there are the drivers that were raising the water through the wall to the citadel, which is a construction equipped in a way that is equipped in a previous way to restore life to the area around the wall with the foundations and standards of civilized coordination.



Fig (6) over all project

### Conclusion:

The importance of the project is due to the fact that the development processes are considered as surgical intervention, with great care for the fabric and the physical character, and following the standards of intervention universally accepted in historical areas and aimed at reviving the architectural fabric of historic Cairo, which reflects the historical period in which it originated, taking into account the adaptive reuse of archaeological buildings, the restoration of unregistered heritage buildings, the removal of glaring distortions in the architectural character, as well as the provision of cultural, professional and tourist services and activities commensurate with the nature of the area, facilitating pedestrian movement, and coordinating pedestrian and street paths to suit the nature of the area. The historic area.

### References:

- Azab, K. (2006), (in Arabic), "The Walls and the Citadel of Salah El Din". – Zahra El Shark Publications, Cairo.
- Azab, K. (2011),(in Arabic), "How did Muslims face the problem of water scarcity". – Hala Publications, Cairo.
- Al Makrizi, (845H) (in Arabic),"Behavior to see Kings Countries". – Dar El Kotob El ElALmya, Lebanon.
- Creswell, K.A.C. (1952), "The Muslim Architecture of Egypt". – Oxford Lane, E. "Description of Egypt".
- Creswell, J. W. (2009). Research design: Qualitative, quantitative, and mixed methods approach (3rd ed.). Los Angles: Sage. Ernest, P. (1998).
- Nawar, S. (1999), (in Arabic), "Water faculties in Egypt since the Islamic conquest till the end of the Mamluk era". – Dar El Wafaa Publications, Cairo.
- Mubarak, A. (1306 H), (in Arabic), "Al Tawfekeya plans for Egypt, Cairo and its cities". – Amiria Publications,Cario.



- Islamic Coptic and Jewish sector, Ministry of Tourism and Antiquities, 2020.
- Yasser Saeed Mohamed BENDARY, CONSIDERATIONS FOR IMPLEMENTING AN EFFECTIVE SYSTEM FOR DESIGNING HERITAGE GLASS PRODUCTS TO RAISE THEIR COMPETITIVENESS, International Journal of Multidisciplinary Studies in Heritage Research, Vol. 1, No. 1, 2018, pp. 1-10.

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