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## THE SCIENTIFIC FOUNDATIONS FOR THE RESTORATION AND CONSERVATION OF HERITAGE FACILITIES (AL-ZA`FAREN PALACE)

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### **Abstract**

*In Egypt, there are many heritage facilities that contain within them many ancient works that carry from the aesthetic and functional components, which makes them unique in their characteristics, which are not rivalled in terms of shape and accuracy of construction except for the Palace of Versailles in France, including by way of example but not limited to the palace of Al-Zayman Arn, the building in the Gothic and Baroque style The palace is located inside the University of Amin Shams in Abbasiya, and it dates back to the year of its establishment in the year 0781 AD, and it is an architectural complex consisting of three floors in addition to an underground floor, and the design includes some of the art of copper, gold and glass composed with lead, as well as its coloured skins in the colours of the sky.*

### **Keywords**

*The Scientific Foundations, Restoration, Conservation, Heritage, Palace.*

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## **Introduction**

In the architectural elements and spherical shapes surmounted by royal crowns and columns that fill the façades and arches of windows and balconies, the palace door is distinguished by leaded glass, and from the above it is clear that the Saffron Palace is distinguished by its architectural richness, which makes it one of the important heritage installations that reflect the progress of human civilization in Egypt at that period.

### **Research problem:**

Some heritage facilities, such as the Saffron Palace, have been damaged due to their use as administrative buildings, as an administrative building of Amman Shams University is now used, which exposes it to deterioration.

### **Research objective:**

The research aims to protect the human heritage from the causes of damage, and to apply the scientific foundations for the restoration, preservation and maintenance of artistic works represented in windows, doors and ceiling made of leaded glass, as well as the historical, archaeological and aesthetic values of heritage facilities in Egypt.

**First: The site of the Saffron Palace, the date of its establishment, the architectural style, and the distinctive features.**

**Location:** Al-Saffron Palace is located in Cairo Governorate, Abbasia district, inside Ain Shams University, and it is currently used as an administrative building for the university.

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**-Creation date:** The date of its establishment goes back to 0781 AD, during the reign of Khedive Ismail.

**Building style:** The building consists of three floors in addition to an underground floor in the Gothic and Baroque style, similar to the Palace of Versailles in France. The Khedive requested that the initials of his name and his private crown be written on the iron gate of the palace and the entrances to the halls and rooms, and the inscriptions still exist today.

- distinguishing features:

The design includes some of the arts of copper, gold and lead glass, as well as its skylights colored by the colors of the sky. Saffron Palace with its architectural richness, which makes it an important heritage facility that reflects the progress of human civilization in Egypt during that period.

**Second: Factors of damage to heritage installations:**

Heritage facilities are exposed to many natural and human factors that represent a grave danger to their work. These factors are classified into natural factors such as earthquakes, lightning strikes, rain and various weather effects, as well as human factors such as fires, wars, looting, sabotage and others.

**Earthquakes and lightning strikes:**

Earthquakes are the most dangerous thing that affects heritage installations and their artistic works, because they lead to complete or partial loss, as well as lightning strikes that may strike a part or cause fires in some parts of the artworks.

**Rain and Floods:**

The heavy and medium rains that the heritage installations are exposed to and works of art made of leaded glass lead to the formation of water droplets on the glass surfaces, which deal with the components of the glass fillings, forming types of harmful bacteria.

**Weather effects:**

Long-term operation negatively affects leaded glass fillings such as thermal range over the years, humidity, wind, etc.

**Fires:**

The materials and materials that make up fillings from leaded glass affect the work of the process of cracking and partial and complete collapse.

**Wars:**

Wars affect by setting fires or demolishing bombs and explosives, which cause severe damage to installations and the works of art they contain.

**Looting and sabotage:**

Through the demolition and destruction of heritage installations and the establishment of modern buildings, which indicates ignorance of the value of these facilities and their artistic works that represent a cultural heritage and human value, as well as the use of some heritage facilities public service facilities such as government departments, schools and others, which were exposed to plunder, theft and vandalism.

**Third: Factors affecting fillings of leaded glass:**

Glass fillings in heritage facilities such as the Saffron Palace are exposed to some influencing factors that damage them, including climatic factors such as sunlight, temperature, wind, humidity and rain, as well as factors resulting from human behavior such as harmful gases, government exploitation, wrong restoration, and chemical, physical and organic pollutants. .

**-Sun rays:**

Direct and indirect rays affect the fillings of leaded glass, and the duration of sunshine, intensity of rays, angles of incidence, and angles of shadows are added to the effect because of their effects on the materials that make up the glass fillings, coatings and pigments used.

**-temperature:**

The difference between the highest and lowest temperature recorded throughout the day is called the thermal range and the glass fillings in the saffron palace are affected, whether the doors are fixed or movable, as well as the windows are fixed or movable and the ceiling, and that the temperature fluctuates between high and low and the effect of this on the materials that make up the glass fillings, coatings and dyes, which exposes them to separation From the surface of the glass and lead to its fall.

**Wind:**

It is a moving air with direction, intensity and speed, which affects the raw materials that make up the leaded glass fillings, resulting in lead twisting and the separation of pieces of glass, and the harmful effect increases with increasing wind speed and being loaded with dust and sand.

**-Humidity:**

Moisture affects glass fillings composed of lead in the long term through theories that grow on the materials that make up the fillings, as well as the decomposition and loss of the putty, and the fall of the glass coatings as a result of alkali oxides on the surface of the glass, which form a thin layer and then opaque layers on these coatings, causing types of mushrooms that lead to Damaged fillings.

**Rain:**

In the long term, they affect the surface of the glass inside leaded glass fillings, as the water-

soluble silicates dissolve into the main elements, leaving a layer of silicon on the surface of the glass.

**Harmful gases:**

The presence of glass fillings composed of lead in the Saffron Palace, which is located in the Abbasid neighborhood, where the heavy traffic congestion and the resulting harmful gases led to the deterioration of these fillings.

**Governmental exploitation of heritage facilities:**

The use of Saffron Palace is an administrative building of Ain Shams University and the misuse of human behavior leads to the deterioration of the state of heritage facilities.

**Wrong restoration:**

The restoration of the Saffron Palace and its works of art by non-specialists led to deformation of the artwork made of leaded glass and the failure to preserve the aesthetic and functional values of these works.

**Chemical pollutants:**

They are the gases emitted from different types of compounds, pesticides and soil pollutants.

**Physical pollutants:**

It is represented in heat pollution and all kinds of radiation, especially the extremely harmful radioactive materials.

**Organic pollutants:**

It consists of degradable materials such as nitrates and other organic fertilizers and litter.

**Results:**

- 1-By applying the scientific foundations for restoration, we preserve the work of the heritage installations and the works of art they contain with their aesthetic and functional components.
- 2-The need to pay attention to research work on modern restoration materials to achieve the best possible results.
- 3-Paying attention to restoration laboratories and equipping them with the latest scientific devices to achieve the best results.

**Recommendations:**

- 1-Create data columns for all heritage installations that have artworks made of leaded glass so that they are restored according to the current state
- 2-Cooperation between the College of Applied Arts and the College of Archeology to apply the scientific foundations in restoring heritage installations.
- 3- Re-employ the heritage installations with activities appropriate to their nature to preserve them and the works of art they contain as a cultural heritage.

4- There must be continuous training for individuals and groups that carry out restoration work in heritage facilities

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