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# THE FATIMID PALACES AND HOUSES IN CAIRO AND FUSTAT, ARCHAEOLOGICAL AND ANALATICAL STUDY

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**Abstract**

The Fatimids built a large number of palaces in Cairo, including the Great Eastern Palace, which was set up by Commander Jawhar, the Western Small Palace, Al-Dardear hall, and the houses of Al-Fustat. Excavations conducted by Ali Bahjat and Albert Gabriel revealed many archaeological houses.

This research deals with a study of the architectural heritage of the Fatimid palaces in cairo and Residential architecture in Fustat through several topics, including: Considerations for archaeological documentation of the houses, the inner courtyard in the houses of Fustat, triple fronted shed, the triangular planning of the house's other wings, the shed and the triple units behind it, the two narrow sides of the shed, the triple division of the facades in the other Fatimid buildings and its relationship to the houses of Fustat, the bent and direct entrances in the houses of Fustat, Construction elements and materials, islamic house elements, general features of the houses and architectural assets.

**Keywords:** Fatimids, Cairo, Fustat, eastern palace, western palace, Al-Dardear hall, residential architecture

## First: Fatimid palaces and halls

### 1. The Fatimid palaces

The Fatimids established in Cairo a large number of palaces, including the Great Eastern Palace, which was placed by Commander Jawhar when he meowed in the place of Cairo, including: the Western Small Palace (Fig. 1), and these are all halls and views from inside the wall of the Great Palace, and they are called: Al-Qusour Al-Zahira, and all of them are called: Al-Qasr.

The caliph's palace, which was called the Great Eastern Palace, was in the middle of the city and occupies an area of forty acres, and includes a group of palaces, and the Caliph

Al-Aziz Billah Ibn Al-Moez (365-386 AH / 975-996 AD)established the small western palace, which was completed by Caliph Al-Mustansir (427-487 AH / 1035-1094 AD)in 459 AH (1066 AD)as its area reached thirty acres [1], [2], [3], [4], [5].

Next to the Western Palace were: the field and the camphor garden, and they had several scenes and royal palaces other than these palaces, including:

The guest house, the ministry house, the old ministry house, the beating house, and the reception rooms in Al-Azhar Mosque and next to Al-Aqmar Mosque and the Pearl on the Gulf in the outskirts of Cairo, Al-Ghazala, Dar Al-Dahab, Al-Maqs, Al-Dakka, Al-Baal, Al-Khams, Al-Taj, Dome of the Air, Al-Jawishiya Gardens, Al-Bustan Al-Kabir, Al-Sukkara, and in the outskirts of Bab Al-Futuh, Dar Al-Malik in the city of Egypt and its glory houses, and industry in the coast And next to the Great Qarafa Mosque, known today as the Mosque of the Awliya' and al-Andalus in al-Qarafa and Barakat al-Habash.

**A. Western Palace** (fig. 1)

As for the Western Palace[6], it is called the Comforter Palace because the Mu'izz li-Din Allah is the one who essentially ordered its construction, and this palace was the home of the caliphate and in which the caliphs resided until the end of their days. This palace included places, including the Gold Hall. This palace was renewed after Al-Aziz, the Caliph Al-Mustansir in the year four hundred and twenty-eight, and in this hall the caliphs used to sit in the procession on Mondays and Thursdays.

The traveler Nasiri Khusraw mentions that "the houses of Cairo in the year 440 AH (1048 AD) were so clean and splendid that it says that they were built of precious jewels, not of plaster, bricks and stones, and most of the buildings consisted of five or six layers". William Al-Suri talks about the splendor of these palaces, their corridors paved with precious paving, their gilded ceilings, and the multi-colored marble columns. Those palaces have vanished, leaving only a few carved wooden panels preserved in the Museum of Islamic Art [6].

We can confirm that the eastern and western Fatimid palaces were distinguished by the four Iwans around the courtyard. It is believed that the eastern palace consisted of two large units, each similar to the western palace in its planning, and the strength of each of them was a central courtyard surrounded by two Iwans.

As for the western palace, it is called the al-Mu'izzi palace, because al-Mu'izz li-Din Allah is the one who commanded his servant and scribe Jawhar to build it when he marched from

the ashes of an African country with soldiers to Egypt and gave him his arrangement, so he placed it in the order according to his drawing of him, and it is said: Jawhar did what he founded on the night he slept. He accepted it in its place, and he saw in it immoderate flowers that he did not like, so he was told to change it, so he said: He dug in a blessed night and a happy hour, so he left it as it is.

Its beginning was with laying the foundation of the Cairo Wall on the night of Wednesday the eighteenth of Sha'ban in the year three hundred and fifty-eight, and two gates were installed on it on Thursday the thirteenth of Jumada al-Awwal in the year fifty-nine, then he turned a wall around it surrounding it in the year three hundred and sixty, and this palace was the caliphate house, and the caliphs resided in it until the end of their days. When the state became extinct at the hands of Sultan Salah al-Din Yusuf ibn Ayyub, the people of the palace were expelled from it and the princes resided in it, then it was ruined first and foremost.

This palace used to include places, including: The Hall of Gold: And it was called the Hall of Gold: Qasr al-Dahab, and it is one of the halls of the palace, which is the palace of al-Mu'izz for the religion of God. Today it is the al-Mansoori practice, and it is also entered from Bab al-Bahr, which is now facing the Kamiliya school.

This palace was renovated after the dear Caliph Al-Mustansir in the year four hundred and twenty-eight, and in this hall the caliphs used to sit in processions on Mondays and Thursdays.

The traveler Nasseri Khosrow mentions that "the houses of Cairo were in (1048) clean and splendid, so that you say that they were built of precious jewels, not of plaster, bricks and stones, and most of the buildings consisted of five or six floors."

William Al-Suri talks about the grandeur of these palaces, their precious paved corridors, gilded ceilings, and multi-colored marble columns. These palaces have disappeared, leaving only a few carved wooden panels preserved in the Museum of Islamic Art.

We can confirm that the eastern and western Fatimid palaces were distinguished by the four iwans around the courtyard, and it is believed that the eastern palace consisted of two large units, each of which matched the western palace in its planning, and each of them consisted of a central courtyard surrounded by iwans.

**B. The Great Eastern Palace**

The Caliph's Palace, which was called the Great Eastern Palace [6], in the center of the

city, and it occupies an area of forty acres and includes a group of palaces, the Caliph Al-Aziz Billah Ibn Al-Mu'izz (365-386 AH/975-996 AD) built the small western palace, which was completed by Caliph al-Mustansir (427-487 AH/1035-1094 AD) in 459 AH (1066 AD), with an area of thirty acres [7], [8], [9], [10], [11],this palace included places, including the Gold Hall.This palace remained the home of the caliphate and in which the caliphs resided until the end of their days. When the state became extinct at the hands of Sultan Salah al-Din, the people of the palace were expelled from it and the princes resided in it, then it was later destroyed.

This palace included places, including: The Hall of Gold: And it was called the Hall of Gold: Qasr al-Dahab, and it is one of the halls of the palace, which is the palace of al-Mu'izz for the religion of God. Today, it is the Maristan al-Mansouri, and it also enters it from Bab al-Bahr, which is now facing the Kameliya School. This palace was renovated after the dear caliph al-Mustansir in the year four hundred and twenty-eight. In this hall, the caliphs used to sit in processions on Mondays and Thursdays. This palace remained a house for the caliphate, and the caliphs lived in it until the end of their days. When the state became extinct at the hands of Sultan Salah al-Din Yusuf ibn Ayyub, the people of the palace were expelled from it, and the princes resided in it, then it was destroyed first by first.

Ibn Abd al-Zahir mentioned in the book Cairo Plans on the authority of Murhaf, the gatekeeper of Bab al-Zahuma, that he said: When Salah al-Din took him and brought out those who had twelve thousand souls among them, there was no solution for them except the caliph and his family and children, so he settled them in Dar al-Muzaffar in the Burjuan neighborhood, and it was known as: the guest house, he said. Next to the palace was found a well known as the well of the idol, in which the caliphs used to throw the dead.

When Salah al-Din removed the state, he gave this large palace to the princes of his state and housed them in it, so they lived in it, and he gave the small western palace to his brother, the just king Saif al-Din Abi Bakr bin Ayyub, so he lived in it, and in it his full son Nasir al-Din Muhammad was born [12].

**C. Al-Dardear hall**

Architectural description(figs. 2:5, pls. 1:4)**:** It is one of the oldest surviving residential halls in Cairo, which was established during the era of the Fatimid rule [18], established in the 6th century AH (12 AD) [6]. Where the houses were built in the form of separate halls

in which the residents resided, and Prince Hassan was a disciple of Sheikh Ahmed Al-Dardir, as he used to frequent the Sheikh in the corner in which he was staying, which was named after his name and led the worshipers and held dhikr circles and interpreted the Noble Qur'an.

The ancient hall was built in the Fatimid style, where the mashrabiya is made of wood. It is divided from the inside into two rooms and a bathroom. The ceiling is high to increase ventilation. It is made of wooden columns and contains many wooden mashrabiyas.

Al-Dardear hall was one of the axes of the history of the emergence of the architectural planning of Islamic schools [19], [20], [21], [22], [19], where the references stated that it was derived from the housing system [23] in which there was a hall [11], which consisted of houses, a hall and two Iwans, and that the hall It has been known since the Fatimid era [23], and orientalists built these theories on the basis of planning sometimes without regard to the architectural elements, or on the basis of the architectural elements at other times without considering planning or taking into account the development of the function [24], [25], [26], [27], [28], [29], [30], and the residential houses were the origin in the emergence of this system [31].

In Al-Dardear hall represented the design foundations for residential buildings in the Fatimid era. In the sixth century AH, another style of halls appeared which continued after that during successive ages. A hall was found consisting of houses hall and Iwan or houses hall and two Iwans as in Al-Dardear hall. The vaults were used in the roofing of the utensils and the wooden lantern (the sistrum) in the ceilings of the houses and the hall, and the walls were arranged with cupboards and (entries) for seating.

Stone was used in construction for the lower part and brick for the upper parts. Marble was also used for floors and skirts, and the brick walls were covered with plaster of whitewash.

Thus, the foundations of environmental design in using the idea of a covered court appeared in this hall, as well as the social foundations of using the recessed entrance to achieve external privacy.

The hall is a covered reception room found in medieval Islamic interior residential architecture, the plan of the hall may have been inspired by the plan of religious buildings which consists of four Iwans,this hall was used to welcome male guests, who were seated on a raised platform. The hall can be located on the ground or on the first floors; the entrance hall is usually located facing the private courtyard of the house.

The hall can be described as a combination of a courtyard and an Iwan, consisting of a central area (the Durqa'a), where guests first enter the hall through an opening; and the raised sitting area, where the guests take off their shoes and sit on the divan, a sofa placed on the floor facing the wall, usually, two Iwans facing each other on the main axis of the hall, with a wall on the two remaining sides [32].

The divan is the raised seating platform. It is located in the Iwan. In the entire composition of the hall, there are two Iwans flanking the Durqa'a on the sides. The Diwan is where the male guests will sit, and there are wall cabinets and wall shelves on the sides of the Diwan, where pottery vessels, jugs, carved metalwork, or books are displayed. Walls can also be decorated with calligraphy, usually of poetry, which is a dominant form of art in the world. Islamic, mashrabiyas are sometimes used to cover the recesses on the side walls of the Iwan. The ceiling of the Iwan is always from a semi-cylindrical vault [6].

**Second: Residential architecture in Fustat**

**1. The houses of Fustat (figs. 6:13)**

Before we talk about the houses of Fustat, it must be noted that the urban history of this city is punctuated by periods of decline and decline due to the fires it was exposed to in particular, and it was customary in the Middle Ages for the rulers of cities to burn them in case they feared the control of the enemies over them Al-Fustat has gone through this painful experience more than once. When Marwan bin Mohamed, the last of the Umayyad caliphs, fled to it in front of the Abbasid armies in 123 AH (750 AD), he had to burn it during his withdrawal from it.

Al-Fustat was also looted when Muhammad bin Suleiman came at the head of the Abbasid armies in the year 292 AH (905 AD) with the aim of eliminating the Tulunid state, as his companions plundered Al-Fustat and destroyed some of its parts.

In the Fatimid era, and despite the prosperity of Fustat as the commercial capital of the state, given that Cairo was a royal city, it was plundered and plundered by the Fatimid soldiers, especially during the time of al-Hakim bi-Amr Allah and his son Al-Azeez Billah. Al-Fustat witnessed the effects of the Mustansiriya hardship that all of Egypt witnessed during the time of this caliph in the period from 457-464 AH (1065-1071 AD), but the effects of the hardship were on it more than others as it is the center of commercial activity.Considering this, Al-Fustat was severely affected by this distress and considering

the large number of its inhabitants.

At the end of the Fatimid era, it was the great calamity, as Minister Shawar, Minister of the Caliph Al-Aadhid, ordered it to be burned in 564 AH (1168 AD) in order to prevent the Crusader Amorian army from controlling it, and it was burned by igniting twenty thousand bottles of oil in all parts of it, and this fire caused the demise of its urban star Since then, the city has been in ruins. Urbanization did not extend to it despite the attempts that were made to push it to it in the Mamluk and Ayyubid eras, when people tended to reconstruct the coastal region, and the area east and north of the Amr Mosque remained in ruins until the modern era, when excavations began that revealed part of it, including houses, cisterns, bathrooms, and others.

The sources that recorded the phases of the prosperity of Fustat's construction reveal the image of the houses of Fustat. Al-Qudsi mentioned in 380 AH (990 AD) in his talk about the houses of Fustat that they are "four floors and five like pulpits, into which light enters from the middle, and I heard that two hundred thousand souls lived in one house." And this is a clear indication of the vertical extension of the al-Fustat floor, until it reached four or five floors, and it also indicates that these floors were planned according to the style of the floor with a courtyard in the middle, which depends on lighting and ventilation due to the narrow streets and tracks of the al-Fustat. Al-Qudsi referred to the enormity of the building of this house, to the extent that one house could accommodate two hundred people.

Nasir Khusraw adds another dimension to the planning of those houses inhabited by this large number, saying, "He heard from one of the respected merchants that in Egypt (meaning Fustat) there are some palaces that include rooms for rent, one of these rooms can accommodate three hundred and fifty people, and the area of those rooms is thirty cubits." And this narration reveals - despite the exaggeration in mentioning the number of people living in the rooms in the aforementioned palaces - that there is a type of house or palace that was designed for the purpose of renting out some of its rooms to such a large number of bachelors who were abundant in the city of Fustat to work in the various areas of Fustat life,

they did not have large incomes that would help them live alone, independent of others.

Previously, reference was made to the role in the city of Cairo in the Fatimid period, whose buildings rose to floors. Nasir Khusraw mentioned that they reached fourteen floors, topping each other, and there are houses of seven floors. It has already been pointed out

that when vertical urbanization becomes a phenomenon as it was in Cairo and Fustat in the Fatimid era, this has its significance related to the high price of the land and the attempt to make optimal use of it by the height of the buildings that are built on it, just as the height of the buildings by several floors requires the use of methods in planning and construction The same applies to the use of building materials that achieve these purposes. There is no doubt that the ability to achieve this is linked to scientific progress in other fields such as architecture and others [33].

The excavations conducted in the city of Fustat by Ali Bahgat and Albert Gabriel revealed many of the buildings of Fustat, including a number of archaeological houses, numbering sixteen, and other houses.

There was a great controversy about the history of the role of Fustat, dating it in the period extending from the second half of the third century AH until the first half of the sixth century AH (9/12 AD), but the problem of dating this role we leave now and we will return to its discussion after the completion of the architectural study of these houses.

**2. Considerations for archaeological documentation of the houses**

Before we present the description of models of the houses of Fustat, it should be noted that many archaeologists, when presenting the architectural description of the ancient houses, must mention important matters related to the history of the house architecture, but they are very important with regard to the archaeological documentation of the house architecture in particular.

Among these matters is the modification that may occur in the houses, due to inheritance or sale, which may lead to the division of one house into more than one house, with some modifications that enable this, such as closing some openings, opening new doors, or making an entrance or passages in addition to other things. of modifications, it is also possible for the opposite to happen that one house joins another for the same reasons, and as a result of this annexation, architectural modifications occur that enable the exploitation of the two houses as one house by connecting them to facilitate the movement of movement between the architectural units in each of the two houses.

Likewise, the social tradition that leads to the desire of relatives to build adjacent houses in one area, ownership of which devolves on them by inheritance, purchase, gift, or otherwise, and is built with a comprehensive planning with one or more entrances leading to an internal corridor to which the houses open, so that the group of houses appears as one

house, Through the manifestations of external communication elements such as entrances, corridors, and external walls, as well as internal construction elements such as common walls, as well as pavilions over internal corridors, internal courtyards, waterways, and associated water factories and channels for supplying kitchens, toilets, and bathrooms, as well as the drainage network that drains into one or more reservoirs, and other elements, which seem common to achieve economic purposes in construction in terms of material costs and space saving, and there are wonderful examples of this in countries that still retain their traditional buildings such as Manah and Adam in the Sultanate of Oman and Esna in Egypt and others.

The documenter of these houses must also be aware of the possibility of the existence of more than one house dating back to more than one era in one area in one city, and Ibn Hawqal referred to this, as he mentioned that in Fustat - the subject of the research - there was the house of Abdul Aziz bin Marwan, "He used to live in it and pour water into it for whoever In this day of our covenant, there are four hundred novels of water." And if Ibn Hawqal had recorded his observations in Egypt and Cairo within the year 367 AH (977 AD), then this indicates the existence of an Umayyad house that continued to be inhabited until the Fatimid era, and this is something we see in many architectural monuments the housing estate that still remains in Islamic cities, and dates back to previous eras, next to modern buildings.

And just as there are buildings left from previous eras, a change occurs in the buildings adjacent to them, so they are demolished and rebuilt for one reason or another, and the division factors for reasons of inheritance as well as buying and selling, and the development of construction and architecture methods help speed change, demolition and rebuilding on residential buildings in particular, and this process may include Demolishing entire houses and rebuilding them, or demolishing and rebuilding a specific sector for one reason or another.

Likewise, making an architectural modification in a house in a period subsequent to the period of its construction to achieve a new functional purpose is one of the things mentioned, as some sectors in the lower floors at street level may turn into shops, and they may also be modified to be used as commercial stores, and this happens in the periods when it is required Urbanization is to bring about such an amendment, which is undoubtedly affected by the general economic and political conditions.

It is also important that the restoration, repair and renovation works in the houses may be followed by the use of new methods, materials and techniques that were commonly used during the renovation periods, and were not present in the period in which the original construction took place, and the opposite can happen, as luxury architectural elements from old houses can be used to be placed in modern houses as a result of the reuse of these old materials in new buildings, and this has been repeated in all ages. Hence, relying on some of these aspects in the history of the builder must be within the framework of these circumstances.

It is also important to point out that the features of the architectural style, whether related to the idea of design, planning and implementation, or embodied in architectural elements and decorations, take a long period of time to crystallize, and the development of this or that idea also takes a long period of time, and perhaps what we see in the idea of opposing iwans in Egyptian architecture in the Islamic era confirms this fact.

Despite the frequent and explicit beginning of this idea in planning in the Fatimid era, it continued with different formulations in different eras, and it reached the peak of its development at the end of the Mamluk era, and just as the idea of design evolves with the development of the formation of architectural elements according to the need, and this development is governed by the development of technologies and sciences that serve architecture, and this is of utmost importance in solving the problem of dating, especially in some elements that embody a practical application of a scientific theory.

It is also important to point out that the rulings of Islamic thought dealing with the aspects of urbanization and architecture have their effects in shaping Islamic architecture in a way that is consistent with these rulings, especially with regard to common walls or the right to use the wall of a house to put the roof wood, or install the doors, or opening eaves, portholes, windows, and wall skylights, and the construction of the beds above the roads, the work of wells, the irrigations and the mills, the construction of the paths, and the elevation of the buildings next to the low buildings of the neighbours.

The relationship of these houses with other residential or non-residential facilities nearby, and other matters that are reflected in one way or another in the architectural form of the houses and in the formation of the architectural fabric of the city as a whole, there is no doubt that awareness of these aspects helps a lot in achieving the correct documentation of the houses and resolving many of the mysteries of their ruins, especially the common

walls.

The planning of the road network in the city from the geographical features of its urbanization and the successive stages of this urbanization, undoubtedly has a clear impact on the final shape of its buildings in its different stages and the different forms of these forms according to these influences and the difference of some of them from era to era.

**3. The inner courtyard in the houses of Fustat**

The courtyard is considered one of the important architectural elements that trace their origins back to the ancient civilizations in the hot region, and the conditions of the hot Arab-Islamic region led to the prevalence of this element in Islamic architecture.

The Umayyad and Abbasid palaces reflect a basic use of the inner courtyard in their plans, and the courtyard continued to be used in the architecture of subsequent palaces until the end of the Ottoman era, and this continuity had its reasons, which are represented in the fact that the inner courtyard helps to overcome the heat of the air, especially in the summer, so that it works as an air well, so the temperature in it is lower than the outside at a rate revealed by studies, and researches that it may reach two degrees Celsius, which helps to move the air from the inside to the outside of the house [34].

The inner courtyard coincides with the Islamic community's keenness to achieve the principle of privacy, as it enabled the inner courtyard to open windows and views of it without having to place these windows in the outer facades overlooking the street in order to avoid the damage of exposure. Increased reliance on internal courtyards as a source of air and light The narrow roads with and without windows in the Islamic city, which community members preferred to have the windows of their homes overlooking them rather than other main wide streets, in which the movement of pedestrians increases, and thus the harm of detection increases, as well as what happens from noise.

The narrowness of these rails prompted the architect to plan the houses and other facilities open to the interior, and the courtyard was the original element that enabled the achievement of this purpose, in order to avoid the damage of the excavation that occurs due to the convergence of the opposite destinations, stressing the damage of the excavation in the case of opening the windows overlooking these facades.

The courtyard was used for the living purposes of family members, and there was room for children to play in it under the auspices of the family, and the courtyard was employed in addition to all these functions as a basic element of communication and movement in the

house, as traffic flows from all wings of the house and from it to the vestibule of the house and its entrance and vice versa, and its mediation helped For the house on the ease of this connection, and within the framework of the aesthetics of the architecture of Islamic houses, which reached a peak, when compared to houses in other civilizations, and perhaps this was related to the fact that the house with these aesthetics was a place of rest and relaxation, especially since the women used to spend most of their lives inside the house and did not go out except for the market or the bathroom. The courtyard architecture played with these aesthetics, creating fountains and basins for flowers, plants and trees.

In addition to what the fountains, water basins and their channels extending from the shadrawans to these basins in these houses have achieved in terms of the aesthetics of seeing the water and the green surface, these units help to moderate the air temperature in the summer, and these fountains and basins with the water they contain can be used in case of a fire did not break out in the house for one reason or another, which means that these watering cans and basins were also one of the most important elements of protection against what the house might be exposed to in terms of fire.

Within the framework of this functional vision of the inner courtyard in the Islamic house, the presence of the inner courtyard in the houses of Fustat was essential, and its necessity was increased by the fact that the streets and railroad tracks of the city of Fustat were mostly narrow, with the largest width of its streets reaching six meters, while most of them reached a width of two meters, which made these streets dark during the day due to the high buildings on their sides that reached four or five floors.

This difficult equation between the narrow streets, the tracks of the city of Fustat, and the remarkable height of its buildings recorded by the accounts of the townspeople and historians, and attested by the remains of the houses of Fustat, reveals a special reason for the city of Fustat, which led to the existence of the inner courtyards of the houses, their wideness and sometimes their multiplicity in one house, so that among the twelve houses that Previously described, we do not find a single house without a courtyard.

What confirms that the courtyards in Fustat were essential for lighting and ventilation without relying on streets and railways is what was previously mentioned about the darkness of these streets and railways during the day and the need to light them, which is also confirmed by the existence of internal courtyards adjacent to the railways that the house directly overlooks and does not separate them. About these rails only the outer wall

of the house overlooking the rails, and perhaps what we see in the courtyard of the second house and the fifth house with their courtyards, confirms this fact and it is a clever idea of the architecture, as the width of the road on which the house overlooks is its spatial space for the courtyard adjacent to the rail in the second floor level from the house onwards. The statistical study of the following inner courtyards in the houses of Fustat reveals important facts that reveal the importance of the inner wall in the houses of Fustat and its special features.

With regard to the number of courtyards in a single house, the study revealed that the minimum limit is one courtyard, but there are houses that include three courtyards, such as the second house (Fig. 7), in which there were two courtyards in the reception and living section, and a courtyard in the section that includes other facilities such as the kitchen and storage rooms. As there were two courtyards in the seventh house, and in addition to that, there was one courtyard in each house, and if the presence of one inner courtyard in one house is necessary, then the presence of more than one courtyard has its reasons, including the large area of the house such as the second house and the fifth house Or the irregularity of its area and its adoption of a specific shape necessitates the construction of two courtyards necessarily, even if its area is small, such as the first house.

A study of the area of the courtyards in the houses - the subject of the research - compared to each other, revealed that the smallest area of the courtyard was the area of the seventh house, with an area of about (9.5) square meters. The area of the house and the area of its inner courtyard, as well as the area of the largest courtyard (130.5) square meters, which is the courtyard of the sixth house. It is noted that this house has a large area, and that it extends relatively long from north to south, which made the architect plan the courtyard of the house as a rectangle in the same direction as the extension of the house in this sector from north to south, to create one courtyard in an area equivalent to two courtyards, which the architect exploited in He made a watering can, a basin for trees, and an extended canal for Shazrawan, which is considered one of the most beautiful Shazrawanat houses in Fustat. This courtyard was not the only one in this house, but the architecture included another large, irregularly shaped courtyard.

The analytical study of the orientation of the inner courtyards of the houses in Fustat – previously described – reveals that six out of a total of sixteen courtyards are oriented in the northwest-southeast direction to help receive the cool breeze in the summer, which is

the correct orientation that achieves this purpose in an ideal manner. The framework of the study of the wind rose in Egypt in general, while he directed the courtyards in the same total in the direction of north / south, exactly with the original directions, and directed five courtyards northeast and southwest.

This statistic reveals an important result, which is that the architect implemented directing the courtyards in some houses in the right direction that helps bring in the cool breeze in the summer, when the size and placement of the house enables him to do so, and he did not adhere to achieving this vision in planning in the houses whose area did not allow Describing it with such guidance, the courts directed other directions northeast and southwest.

The census also revealed an optimal utilization of the space of the house, and in light of this fact, what Creswell mentioned about this specificity can be reviewed, as he concluded that most of the houses were oriented in the north-west / south-east direction, which is evident as (37.5%) of the houses the subject of the study - it was according to this direction northwest / southeast, and the other houses whose houses were oriented north-south amounted to (31.25%), which means that (68.75%) oriented correctly, while those oriented northwest and southeast reached (31.25%) It is also possible to review what Farid Shafi'i mentioned in this regard, as he rejected Creswell's interpretation without examining the directive in a study that shows sound statistics [35].

The study of the shape of the area of the courtyards of the houses revealed that the rectangular shape was the predominant shape, as the number of courtyards in the houses under study reached seventeen courtyards, including nine rectangular courtyards, two square courtyards, and six courtyards with an irregular square shape, and here it must be noted that the majority of the courtyards The length of the long rectangular side is similar to its short side, with the exception of one courtyard, which is the courtyard of the sixth house, in which the large difference between the length of the long side and the short side was revealed in its rectangular shape (14.5 x 9 m).

Here it must be noted that the courtyards with irregular square shapes were also imposed by the shape of the space on which the house was built, as in the first house and the seventh house. There are also some other courtyards that were not overlooked by the main reception units, and the general planning of the house dictated that it take this form, such as the courtyard of the second house in the facilities section, the small courtyard in the first

house, and the courtyard of the facilities and accessories section in the sixth house.

The study of the shapes of the courtyards, especially square or rectangular, as regular square, reveals that the squareness of the courtyard was a basic axis in the planning of the houses, around which the rest of the regular square and then irregular elements arise in the margins of the house space in succession, and this was evident in the large houses that enable It is achieved easily and without imposing an irregular squared area of the yard.

The irregularity of squareness in the courtyards of the facilities and annexes departments, as in the second house and the sixth house, reveals that the architect cared about squared the courtyards of the reception departments to achieve their architectural aesthetics arising from this quadrature in view of their function, which was not of the same importance in the facilities and annexes departments. The extent to which the architect is keen to achieve the aesthetic values of the reception sections, which was achieved by squaring and other forms and methods of planning other than the shape of the courtyard.

The statistical study of the location of the courtyards of the houses shows that eight of them are located in a relatively middle position of the area of the section in which the house is located if it has more than one courtyard, or in the middle relatively if it has one courtyard, and that nine courtyards were located in a side of the area adjacent to the road which the house overlooks directly and is not surrounded by the units on the four sides of the central courtyard, and this diversity and in this ratio that is almost equal is primarily related to the shape and placement of the space on which this or that house was built, and the position of the courtyard is reflected in the center of the house surrounded by its units, in the general form For the house from the outside, as the house whose courtyards are in the middle is surrounded by the courtyard of the wings of the house on the four sides, but in the case of the side courtyard, the facades overlooking this courtyard from the level of the second floor onwards will have a different shape, as the house units may overlook the courtyard between three sides, as in the fifth house, Or from two sides, as in the first house, and the fourth house.

The architect beautified the courtyards of the Al-Fustat houses in the reception departments by creating fountains with fountains, water basins, flowers and trees. It has already been mentioned that the fountains represented elements of fire protection in the first place. Two of them have fountains in the corners or in the middle, while the number of courtyards devoid of the presence of such fountains is six, meaning that the percentage (54%) of the

courtyards has fountains and (46%) of the courtyards without fountains, which is a significant ratio if we take into consideration That the owners of small houses could not establish in their houses such waters as the cost of their construction and the process of operating and maintaining them, cleaning them and filling them with water, like the owners of the first and seventh houses, and if we also take into account that some of the houses that have more than one courtyard, the owner did not establish only one watering can in one of its courtyards, as in the fifth house.

The percentage of courtyards with watering cans seems high and is explained by the real purpose of establishing these watering cans, which is to be a preventive element to be used to extinguish fires that may have broken out in the house or any neighboring house in which there is no watering can within the framework of the integration of the Islamic community to ward off danger, and we have indicated that This architectural planning was applied in the palaces and houses of the Fatimids in Cairo, and its presence in the city of Fustat, which is reflected in its legs with this fountain, represents the important material evidence of this preventive architectural vision, especially in a city like the city of Fustat, whose narrow streets and railways do not enable them to extinguish the fires whose impact is Especially since the houses were multi-storey, especially for the population and the increase in danger, so it is established within the framework of applying the compact system for the facilities (Compact Style).

In addition to the purpose of prevention, the fountain in the courtyards achieved the purposes of climatic treatment by tempering the temperature, this seems evident from the large number of fountain and also from the construction of some shadirwanes in some houses connected by channels to these fountain, as is the case in the third house and the sixth house, the achievement of this purpose was confirmed by flower beds, plants and trees, in addition to the aesthetic values achieved by all these elements.

**4. Triple fronted shed**

This pattern of the facades of the sheds is one of the important planning elements in the facades of the units overlooking the inner courtyard of the houses of Fustat, so that almost one of the houses of Fustat is devoid of the presence of such a shed [36].

There were many sheds of this style overlooking one courtyard, as we find in the first house, and there were also two sheds on both sides of the courtyard of the sixth house, one on the north side and the other on the south side. As for the rest of the houses, one shed

overlooks the single courtyard - in the reception departments. A study of the locations reveals Sheds with three-part facades on the courtyards, that there was no specific direction associated with the apparent movement of the sun or the wind, as these sheds were found in all directions, of course, governed by the original direction of the courtyard.

It is also important to point out that the presence of the shed was linked in all cases to the element and units that are located behind the shed, which it was noted that they include the main iwans and their surrounding rooms or other elements imposed by planning and space such as entrances, corridors or others. On the courtyard, which reveals a basic link between this unit, which is the "iwan", and the presence of a shed in front of it.

It is noteworthy that the triangular planning of the shed echoes in the units behind it that are full in the main iwan, and the units that surround it, and since it was also borrowed in the form of its parallel wall in the three-part façade, so the wall included three openings, the widest of which is the middle and the two sides are relatively narrower, and the axes may coincide the three openings in the shed are related to the three openings of the parallel wall that represents the facade of the triple units behind it, and they are of the same width, and they may differ, especially the middle opening, as the Iwan opening is often wider than the middle opening on its axis in the shed, which means that the architecture did not adhere to the planning of the three openings the shed has the same axes and the same measurement of the width of the units behind it as much as it adheres to the frequency of the three openings, which is governed by the number of units behind the shed, which was often three.

In the context of the foregoing, the function of this shed is largely clear, as it provides a shaded area in front of the large Iwan and the units that surround it, often two rooms on both sides of the Iwan, which adds space to this section, which can be used for various purposes, whether in the case of receiving guests or if it is used by the people of the house, but it seems that there is another purpose for the presence of this particular shed in this section or the corresponding sections overlooking the courtyard, as in the first house (A), and the sixth house in which the presence of the shed is repeated, and if we bear in mind that these sheds are not for preventive purposes From the sun and rain it can be for protective purposes other than human eyes or detection damage.

The damage of detection may be from the guests who can be received in the houses in these sections, and making this shed does not enable those inside the iwan or the two side

rooms to see the people of the house on the upper floors, just as it is not possible for those on the upper floors to reveal who is in the Iwan and the two rooms on its sides Especially since the depth of the shed was sufficient to achieve this, and here it should be noted that it is very likely that the owner of the house rents one of the floors in which he lives to strangers, and he can receive his guests on the ground floor in the main Iwan preceded by the shed, and in this case the need is more urgent to protect from Units behind the shed from some residents who are tenants.

This matter becomes clearer in the light of Nasir Khusraw's narration about the houses in Cairo, whose owners used to live in the upper houses of them, and rent the floors below it, which means that the ground floor is used in the houses of Fustat mostly for reception, which is what Ibn Hawqal referred to when he mentioned that the ground floor was not used in The residential units, and the presence of reception units in it means that it is often used for this purpose. Thus, it is clear that the shed in the houses of Al-Fustat was intended as a preventive measure to prevent damage from detection, whether for those who use these units or the residents of the house, whether they are owners or tenants or owners and tenants.

The style of the shed with a three-part facade or openings was found in the two houses that were uncovered in the camp and date back to the Tulunid era. Similar examples were also revealed in the city of Samarra [12], [13], [14], [15], [16], [17]. It was also found in the southeastern and western houses in the houses attached to the Al-Ukhaidir Palace, which reveals that this Planning has its origins in the Abbasid architecture and Iraq, and it mostly came from Iraq to Egypt in the Tulunid era [37].

**5. The triangular planning of the house's other wings**

The planning of the triangular façade was reflected in the planning of the other façades overlooking the courtyard, especially the façade opposite the shed façade within the framework of achieving the principle of symmetry, or exactly the same measurements, but he tried that as much as possible to adjust the symmetry, within the framework of the foregoing, it can be said that each façade was planned within the framework of the idea of the triple division, given that it is not seen at the same time as the other façades, difference in detail,

Here it must be noted that harmony and symmetry were adhered to by the architecture to a large extent in each of the two opposite facades, and it reveals the flexibility of the

architecture and non-compliance with the triple division, which we see in some facades overlooking the courtyard and some houses, and it included four openings, not three, due to the circumstances of its planning, such as what is in the first house (A).

In some cases, there were only two and not three, as in the seventh house (b), but the division differed in two opposite facades as well, as is the case in the sixth house in the two facades that do not implement a shed, as one of them includes four openings, which is the eastern facade, while the western facade has only three.

These rare and different examples of the general phenomenon represented by the triple division of the courtyard façades reveal that the architecture was not stereotyped in its planning vision, but agreed between space and general planning, a harmony that achieves full use of the space according to its planning vision regardless of adherence to a specific form, a feature that was repeated In his schematic vision of directing the courtyards, it was also represented in the different sizes and axes of the triangular divisions of the facades overlooking the courtyard, the excavations conducted since (1912) revealed important aspects regarding the local architecture in Islamic Egypt, which was reflected in the urban morphological aspects and the urban fabric of the Islamic city during the early period. This was also reflected in the layout of the houses, which were the courtyard, the three-part unit, and the three-arch facade; basic elements in its planning [38], [39], [40], [41].

**6. The shed and the triple units behind it**

The triple division of the facade of the shed overlooking the courtyard was associated with the units that preceded it, which were mostly three units, and this connection is undoubtedly related to providing these units with the lighting and ventilation they need from the courtyard, and it is also related to ease of communication and movement, and providing a measure of privacy for the two side units or any Other units may be adjacent to the middle Iwan instead of the two rooms, and only the seventh house (b) deviated from this general phenomenon, which was built behind the courtyard shed, with only two units consisting of an Iwan and a room.

The existence of this rare case explains the circumstances of the space on which it was built, which did not enable the work of three narrow units, so the architect preferred to make two units, one of which is a relatively large Iwan, and this example is added to the examples that reveal the flexibility of the architecture, and its lack of adherence to general features in planning that do not fit the space of the house, and his general vision for its

planning..

The tripartite planning of the reception units represented in an iwan surrounded by two rooms is an old planning found in the Sasanian architecture in Shirin Palace and inherited by the Abbasid architecture in Iraq and came to Egypt in the Tulunid era.

It was closely linked to the shed, so that everyone who studied this planning combines the three-planned shed with the three units behind it, and considers them to be a single planning, even though the three-planned units consisting of an iwan surrounded by two rooms abound. In the trilogy of units, but the units preceded by a newspaper certainly represent an independent pattern intended to achieve the aforementioned goals.

There is no doubt that the three-planning pattern, which does not precede the shed, may have been used for purposes other than the purpose of receiving, such as storage, as it is customary to use partitions in the ground houses for this purpose, and it may be used for other purposes that do not necessitate the work of shed precedes it, and thus it is clear that the units of the ground houses that it represents the planning of the remaining ruins of the houses of Fustat was used as reception, hospitality, or storage units, and could be used in some cases for living in the houses whose owners were unable to build upper floors for the residence of the harem, which is consistent with what the historical sources indicated, which indicated that the ground floor was not inhabited. Mostly, the preference for family residence on the upper floors is to provide privacy for the harem and the people of the house in general.

**7. The two narrow sides of the shed**

The planning classification of the narrow sides of the shed reveals that the majority of the sheds were bordered on the narrow sides by two walls devoid of any decorative formation. Each side is tripled with a beautiful architectural formation that increases the width of the shed in addition to what it achieves of aesthetic architectural values, as is the case in the fifth house, the seventh house (A) and the eighth house.

In some examples, a door opening was found on these two sides that lead to a small sum, as in the first house (D), the third house, and the eighth house. In some cases, an opening on either sides or on one side is a door opening that connects from the shed to other units of the house adjacent to it. In these two aspects, and in these cases, the shed can be considered a communication and movement element that serves these units just as it serves the units behind them. Examples of this are what was found in the northern courtyard shed

in the first house (C), the third house courtyard shed, the fifth house courtyard shed, and the northern shed on the courtyard the sixth house.

**8. The triple division of the facades in the other Fatimid buildings and its relationship to the houses of Fustat**

It is important to point out that the architecture in the Fatimid era used the triple division that was previously mentioned in other types of buildings that date back to the Fatimid era, especially in the architecture of scenes, in a manner similar to the division of the houses of the façade in which the middle opening is wider than the two sides, and we see Examples of this are in the façade of the qibla portico in the scene of al-Juyushi, in the façade of the scene of Kultham, in the façade of the shrine of Yahya al-Shaybah, and the scene of Sayyida Ruqayyah.

But the function of the monument and the function of the shed differs from what is in the houses of Fustat, as was found in the fort of Deir al-Muharraq and the fort of Anba Anthony, which date back to the Fatimid era, inside the angel's church, each of them inside has an internal partition built in the same shape consisting of pediments with three arches, the middle of which is the widest and the highest of the two arches. The two sides, which indicates that the triple division was among the intangible vocabulary in the Fatimid era, and was employed in each facility according to the circumstances of its use and the style and materials of its construction, a use that confirms the prevalence of this division in the Fatimid era, as it was in the Tulunid era and the Abbasid era, but with different formulations It is different styles of architecture.

**9. The bent and direct entrances in the houses of Fustat**

Originally, a military architectural element was known in the ancient Egyptian military architecture in Shunet al-Zabib and dates back to the period between the years (2625-1788 BC), as it was known in the city of Sumhuram in the Sultanate of Oman in one of the entrances leading to the castle, and this example dates back to the 4th century AD In Islamic architecture, it was used in the entrances to the city of Baghdad, as it was found in the Fatimid era, in the gates of Cairo in the northern wall, and then it was used after that in the Ayyubid and Atabeg architecture. In the gates with facilities more than one refraction, and the Byzantines applied it in the fortifications of the city of Ankara in the year 245 AH (859 AD), after the Abbasid caliph al-Mu'tasim raided it, who destroyed it in 224 AH (838 AD), meaning that the ancient Egyptian and Arab architecture, as well as the Islamic

Abbasid preceded in Her use of this element of war architectural planning.

The planning of bent entrance in military architecture aims for the attackers to turn left and their right is exposed, making it easy to hit their arms and hands that usually carry swords, as the warrior held his sword with his right and shield with his left.

It is planning that differs in form and function from planning bent entrance in houses, where bent entranse in houses performs two important purposes, one of which is to achieve the purpose of preventing the eyes of people passing by on the road from revealing who is inside the house if the outer door is opened, and this is the main purpose, and there are those who believe that this bent entrance was to increase the chances of defending the house in the event of internal or external unrest or strife.

The study of the entrances to the houses in Fustat reveals that the architects mostly planned the entrances to the houses with a pent-shaped form (Bent Entrance) in various formats that were mostly related to the shape and space of the location on which the house was built more than it was related to something else. The bent entrance may be a corridor that turns one or more times until the inside reaches the courtyard of the house. The planning of the corridor may be regular, and the space may be narrow in some places and wide in other locations, as in the entrance to the third house and the eighth house.

The refraction of the entrance may also be achieved by planning the entrance in its form as consecutive and regular square spaces whose openings are connected by different axes and together form a retracted entrance. Examples of this are the entrance to the first houses (A) and the first (B) from the non-window rail, where the opening of the door leads to a spacious It ends in a second hallway, next to which are two openings, the eastern door leading to a hallway through which one enters the first house (A) and the western one leading to a hallway leading to the courtyard of the first house (B). This example is repeated in other forms, but with the same idea in the northern entrance of the third, fifth, and sixth houses.

One of the simple models in the southern entrance and the eastern entrance with this planning is in the sixth house, and among the entrances that indicate the intelligence of Islamic architecture is the entrance to the fourth house, where the door opening leads to a spacious room and a robe that enables the work of the inner opening that leads to the courtyard in a way that is not on the same axis as the outer door opening.

It is important to point out that some of the entrances to the houses were not planned in a

refracted form, but they lead directly to the courtyard of the house, and it is noted that the architect implemented this type of entrances in response to the area of the house and also in connection with the position of the rail that overlooks this space and among the houses with direct entrances is the first house (C ) and the first (d), and the entrance to the seventh house (a) and the seventh (b). There is also another quality of direct entrances that did not need to be formulated in a broken form, which are the entrances that lead to the stores in the first house (C), as well as the entrance leading to the facilities and accessories section in the sixth house. This type of direct entrance confirms that the bent entrances were planned with the aim of providing privacy for the main sections of the house.

One of the important features of the entrances to the houses is the presence of more than one entrance to the house, and there is no doubt that this was related to the rails overlooking the house, and it was related, on the other hand, to the functional purpose of this or that entrance. Three entrances, including access to it from a non-permeable street and a window street, and one of them is the northeastern entrance on the non-permeable street, was for entering goods, which are stored in warehouses in this sector of the house, which were mostly for a commercial purpose, as well as the third house for which two bent entrances were built on two streets overlooked by the house and the sixth house, which overlooks two streets. The southern entrance was allocated for access to the main sections of the house, while the eastern entrance was allocated for entering the facilities and accessories.

The distribution of the entrances to the first houses (A), the first (B), the first (C), and the first (D) reveals the avoidance of constructing directly opposite doors or entrances to the houses, as well as the care to keep the successive entrances far from each other, and planning them in a manner that does not cause damage to the detection We notice this in the entrance leading to the warehouses in the first house (C) and the next entrance to it in the front of the impenetrable street, as well as the entrances to the seventh house (A) and the seventh (B).

The southeastern entrance to the first house (A), and the entrance to the first house (B) opposite it from the eastern side, reveals that it is although the two doors were placed on two wide sides, one was taken into account so that they do not reveal each other, and the phenomenon of installing doors in houses in Islamic cities is a basic phenomenon in planning known in Islamic cities in order to prevent the harm of revealing.

In the light of the foregoing, it is clear that the generalization error is that the houses of Fustat have bent entrances. It is also clear that the planning of the bent entrances differs from the planning of the broken entrances that arise in front of the gates of the cities, as the construction of the bent entrance is in the form of an intersecting wall in front of the city gate, which is a form that differs from the planning shape of the bent entrance at the entrance of the house, inside its door opening and up to the opening ending in the courtyard.

Through the previous descriptive and analytical study, we can conclude some general results, and from these results it is clear that Creswell's classification of the eight houses could not identify each house separately, especially with regard to the first house, which turned out to include four of the houses, as well as the seventh house, which is in fact, two houses. It is also clear that the classification of Farid Shafi'i and the differentiation between the designation "house" and what he calls "house" is not based on a correct knowledge of the term house and the term house, just as his connection between the use of the term house in residential units attached to the Umayyad and Abbasid palaces and the one-building house is incorrect.

This study showed that the main axis in the planning starts in the regular squareness of the court and the squareness of the main units overlooking it, starting from the shed and the main iwan, the rooms on both sides, then the units overlooking the court from the other sides, then accommodating the spaces that are irregularly squared in the outer margins of the house space. It is noted that the general planning is divided into two patterns, a style that is the triple planning with an Iwan surrounded by two rooms and preceded by a shed, which is the planning that was found in the Tulunid houses that were revealed in the military, as well as in the houses of al-Ukhaidir Palace and the houses of Samarra. It is of Iraqi origin and came to Egypt - as studies indicate - in the Tulunid era. These planning traces its origin back to the Shirin Palace, and this planning developed in some houses that took the explicit form with four Iwans overlooking the court, one of which was preceded by a shed, which is the planning that crystallized in the western palace on which the Maristan of Qalawun was built.

This planning was mentioned in its full form in some houses, only two iwans were found in some houses, and three were found in some cases. The important thing is that the Iwan began to develop into a clear form. Among the more advanced planning features is the use

of one of the iwans as a place for the Shazrawan or the making of a room behind the Iwan for the same purpose. Despite the clarity of this planning, some iwans opened on the two side rooms and the rooms behind the Iwan to provide alternative passages that provide a second passage line other than the main passage line from the iwans to the courtyard, and this the development did not find anything similar in the two houses that date back to the Tulunid era.

And if we link these advanced features in the planning with the stucco decorations referred to by Creswell that were found in the eighth house, it becomes clear that the houses of Fustat are likely to be attributed to the Fatimid era. Within the framework of the functional division of the house, Creswell tended to point out that the houses, which include two sections with two courtyards overlooked by reception units, were planned within the framework of the concept of allocating one wing for the harem "Haremlik" and the other for men "Salamlek", which is a division that crystallized in the houses in the Ottoman era, and it reflects an Ottoman Turkish culture in the first place The first, but it was not, as Farid Shafi'i mentions, also in the houses in Fustat, as it tends to be that the harem used to live in the upper floors of the houses, and these floors included the bedrooms, while the abode and other units on the ground floor were designated for reception and hospitality.

This opinion can be accepted in the context of the descriptions previously presented of some of the houses and in the context of what some sources indicated that the houses of Fustat did not inhabit its lower floor, but some houses that included alternative corridors intended for planning reveal the possibility of using the harem for reception units in the ground houses, and the inclusion of more than one reception unit in the house provides another opportunity for women to receive their guests in these units as well.

As for the facilities and rights attached to the houses, such as kitchens, storage cells, and stables, it is noted that they appeared in some houses and decreased in other small houses, and this matter is certainly related to the social level of the owner of the house, and it turned out that some houses included such facilities, both Creswell and Farid Shafei did not pay attention to its study, who indicated that it might have theoretical signs that depend on the sources.

The study revealed some important facilities, such as toilets and bathrooms in some houses, and the study of their locations revealed that some of them were within the framework of the architect's realization of the wind rose and made them in the southern,

southeastern or southwestern positions, but in other cases he was forced to put them in the northern side due to the association of the location of such elements with the street that It is overlooked by the house to facilitate the removal of waste from its tanks through the external openings of these units. As for the design of these units, it is noted that it is through broken corridors in order to provide privacy for its users, and it is also noted that there are channels in the walls to drain water from units similar to the upper floors, which is no longer evidence of the existence of more than one floor in these houses, and if the bathrooms may rarely exist in the houses the ground floor on which this study was carried out, the upper floors had bathrooms in a more dense manner, given that they were adjacent to the bedrooms, and this is likely to be due to the channels in the heart of the walls that were for drainage.

It became clear from the study of the first house (A) and the third house (A) that each of them contained shops, just as the first house (A) contained stores for goods that were sold in the three shops attached to this house mostly, and it records an early model for the shops in the houses of Fustat That commercial city of Egypt in the Fatimid era, an example that was repeated in the Ottoman era in the houses of rationalization, which indicates the continuation of the idea of annexing the shops in the house, which are located on window rails.

**10. Construction elements and materials**

The houses of Fustat were built for hire with mortar of lime and qasrmal, and it is noted by studying the construction style, especially the construction of courses, where the bricks are placed on its narrow side every four or five courses and repeating that, and comparing that to the style of building Fatimid buildings, which is analogous to the factories and ovens in the region south of the White Monastery in Sohag, as well as the style of The construction of forts in some monasteries that date back to the Fatimid era represents evidence added to the evidence that suggests the attribution of these houses to the Fatimid era. As well as the use of plaster and brick in the decoration of some houses, and many of these pieces were found that are kept by the Museum of Islamic Art, and these pieces vary in decoration styles between the style that resembles the art of the third style of the Samarra style, which is the style that was carried out on wood in the same era and continued in this stage The first is from the Fatimid period on Fatimid woodwork and decorations, then it began to develop.

Also, some of the decorations in the pieces are similar to the decorations on some Fatimid artifacts, such as rosettes, as well as rosettes inside the squares, and the method of executing stucco decorations from which thin brick molds are preferred is a style that Creswell confirmed is a style of decoration of Seljuk origin, and he referred to examples that date back to the first half From the 6th century AH (12 AD), as previously indicated, which adds further evidence that the decorations of these houses date back to the sixth century AH(12 AD).

In the context of the foregoing, it is possible to review what Abbas Helmy mentioned about the houses of Fustat dating back to the third century AH (ninth AD), an opinion rejected by Farid Shafi'i, as well as the broad framework for dating these houses to find out about Bahjat and Gabriel a date that accommodates the period confined between the 3rd/5th century e (9/11 AD), and he tried to attribute some of the houses to the Tulunid era because of their similarity to the style of the Tulunid houses and others to the Fatimid era, considering the manifestations of difference and development, which is a vision in history that relied only on planning. In the context of what was previously presented regarding planning, building methods, and decoration, it is likely that these houses are attributed to the Fatimid era, and some of them, such as the eighth house, date back to the first half of the 6$^{th}$century AH (12 AD).

**11. Islamic house elements**

The design of the houses was taken into consideration their suitability for the country's atmosphere and eastern customs, thus ensuring the sanctity of the house and making it impossible for those outside to see the harem of the dwelling inside it. It was also characterized by privacy and air conditioning of its rooms in natural ways. The streets and alleys of Fustat were illuminated day and night, which made the presence of a courtyard necessary for ventilation and also for lighting, as it is clear from al-Maqdisi's narration that there is a middle inner courtyard for the houses, so he says: "The houses are four layers and five like beacons, light enters them from the middle [42]."

The recent study revealed that the minimum number of courtyards in one house is one courtyard, but there are houses that included three courtyards in which there were two courtyards in the living and reception sections, and a courtyard in the section that includes other facilities such as the kitchen and storage rooms, as there were two courtyards in the seventh house [37].

The fountains were also of great importance in the houses of Fustat, as they achieved the purposes of climatic treatment by tempering the temperature in addition to the purpose of prevention and protection in the event of a fire, in addition to their aesthetic values [37].

The shed with a three-part façade is considered one of the important planning elements in the facades of the units overlooking the inner courtyard in the houses of Fustat, where almost one of the houses in Fustat is devoid of the presence of such a shed, behind which are located other elements that include the main halls and rooms, and the houses in Fustat are distinguished by the presence Recessed entrances that achieve the purpose of preventing detection damage to the eyes of passers-by. The houses also included important facilities such as kitchens and storage bins, as well as toilets and bathrooms inside, which became clear or decreased in some houses according to the social level of the owner of the house. The toilets were often on the ground floor, connected to the drain directly or through channels.

Through the excavations conducted at the site of the city of Fustat, the areas of the houses can be identified to a large extent, and this is confirmed by what Nasir Khusraw said: "I heard from one of the expatriate merchants that in Egypt there are some houses that include rooms for rent, one of which accommodates three hundred and fifty people. The area of those rooms is thirty cubits by thirty cubits (16 x 16 m), which is a large area [43].

**12. General features of the houses**

If we put the planning that were drawn on the same scale for the main part of each house, one of them to the side of the other, we find an amazing degree of similarity and at first glance, and we find in each case a rectangle of varying dimensions, and on one of the sides of this dish there is a plan of three arches, the middle arch of which is wider than the two arches on the sides and is based The arches are on rectangular pillars of bricks, and these three arches form a shed behind a migrate depth greater than its width, and agree with the middle arch, with a smaller room to the right and left, and open to the shed, but without direct contact with the side rooms. On the other three sides, there is a room or filling placed on a central axis. With an entrance or opening to the right and left, and the main axis runs in general from the northeast to the southwest, and there is a bypass with houses that has a right angle (the bent entrance) that generally leads at the entrance to these side openings so that the courtyard cannot be seen from the street or the unit used in the work Gabrielexplains that the working arm of 64 cm is the one that appears to have been used.

Here, it can be verified that the houses of Fustat had many floors, especially in the Fatimid period, and some important points can be summarized as follows:

1. The width and thickness of the main walls, often up to a meter.
2. The use of stone and brick in the construction of the main walls and facades of buildings.
3. The presence of staircases ascending to the top.
4. The presence of main channels for drainage of a square or rectangular section that were left inside the back wall during construction, especially near the toilets or in the walls themselves.
5. The presence of pottery pipes of round cross-section buried inside the walls, their cleanliness indicates that they were used with pure water.
6. Some large houses may contain mosques, bathrooms, and members of the family.
7. Some of the houses were surrounded by one wall, such as the first house, which turned out to contain four houses, and the seventh house, which was actually two houses [37].

The three-vaulted transverse shed has three parallel rooms behind it, the middle one of which opens onto the canopy in its entirety. This is the system that is called the style of the hall in the form of an inverted letter (T). We find it in Fustat. Also, the Levantine planning, as we see it in Qastal, Qasr Kharana, Al-Mashta and Al-Tuba, was completely different, and therefore it can be said that the planning that we see in Fustat was transmitted from the Arabs, perhaps in the Tulunid era [12], [13], [14], [15], [16].

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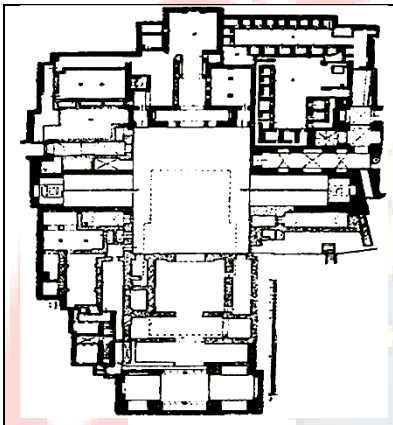


fig. 1. Western Fatimid Palace

fig. 2. Al-Dardear hall

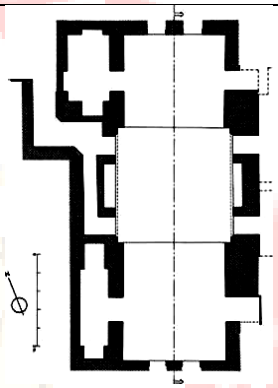


fig. 3. Al-Dardear hall

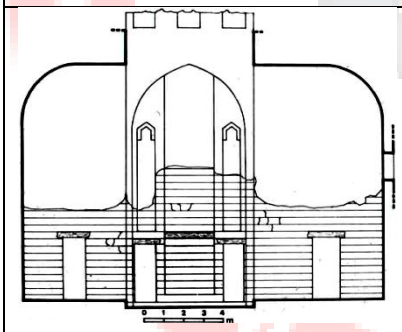


fig. 4. Section of Al-Dardear hall

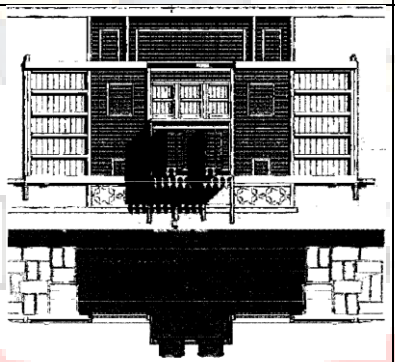


fig. 5. Mashrabiya with front of Al-Dardear hall

fig. 6. The first house in Fustat

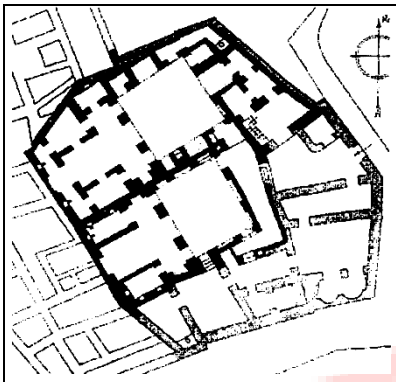


fig. 7. The second house in Fustat

fig. 8. The third house in Fustat

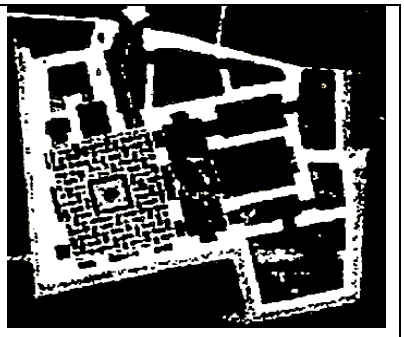


fig. 9. The fourth house in Fustat

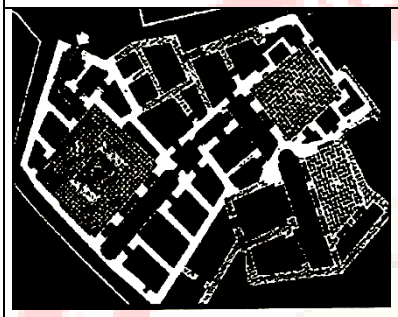


fig. 10. The fifth house in Fustat

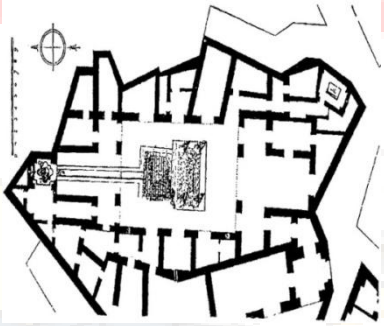


fig. 11. The sixth house in Fustat

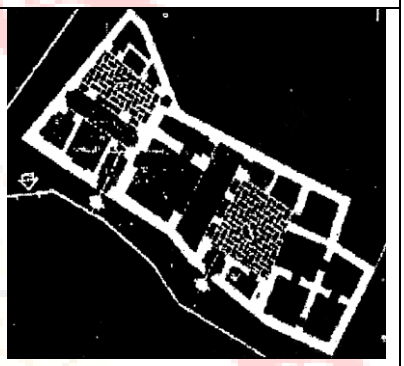


fig. 12. The seventh house in Fustat

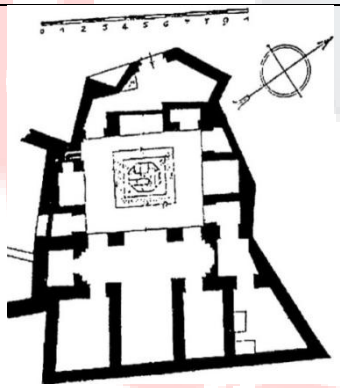
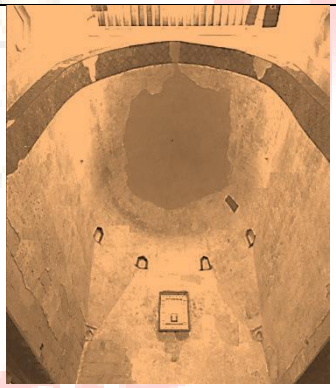


fig. 13. The eighth house in Fustat

pl. 3. The hall and the Iwan in the Al-Dardear hall



pl. 4. The Iwan in the Al-Dardear hall

pl. 1. Al-Dardear hall

pl. 2. Al-Dardear hall

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