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RESIDENTIAL ARCHITECTURAL HERITAGE IN THE FATIMID ERA, ANALYTICAL 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, including: the Western Small Palace, and Al-Fustat. Excavations conducted by Ali Bahjat and Albert Gabriel revealed many buildings, including a number of archaeological houses. Sixteen houses and excavations continued after that to reveal other houses through excavations.

This research deals with an analytical study of the architectural heritage of the Fatimid palaces and houses in Cairo and Fustat, through two axes. The elements of the Islamic house, which include the inner courtyard, the penthouse with a triple facade, and the division, the tripartite layout of the other wings of the house, the shed and the triple units behind it, the recessed and direct entrances to the foyer houses, the general features of the houses, and the elements and materials of construction.

Keywords: the Fatimids, Cairo, the eastern great palace, the western small palace, Al-Dardear hall, al-Fustat.

First: Fatimid palaces and halls

1. The Great Eastern Palace

The Caliph's Palace, which was called the Great Eastern Palace [1], in the center of the city, and it occupies an area of forty acres and includes a group of palaces, the Caliph Al-Aziz BillahIbn 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 [2-3-4- 5-6]. 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.

2. Western Palace(fig. 1)

As for the Western Palace [1], 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 NasiriKhusraw 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[1].

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.

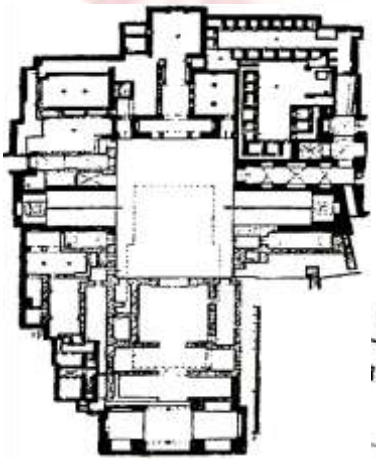

fig. 1. Western Fatimid Palace

fig. 2.Al-Dardear hall

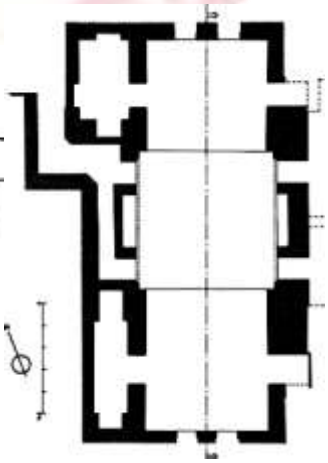

fig. 3. Al-Dardear hall

3. 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 [7], established in the 6th century AH (12 AD) [1]. 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.

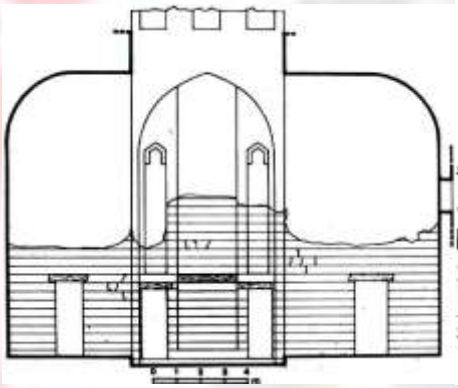

fig. 4. Section of Al-Dardear hall

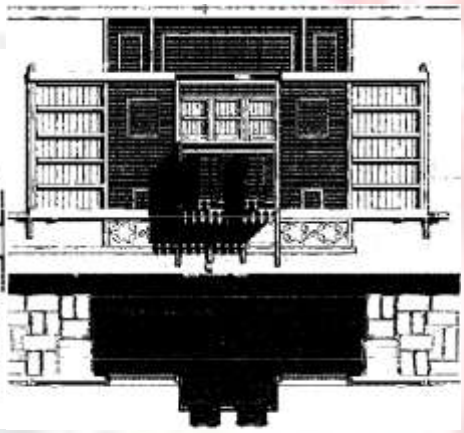

fig. 5.Mashrabiya with front of Al-Dardear hall

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 [8-9-10-11], where the references stated that it was derived from the housing system [12] in which there was a hall [6], which consisted of houses, a hall and two Iwans, and that the hall It has been known since the Fatimid era [15], 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 [16-17-18-19-20-21-22], and the residential houses were the origin in the emergence of this system [23].

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.

pl. 1.Al-Dardear hallpl. 2.Al-Dardear hall

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.

pl. 3.The hall and the Iwan in the Al-Dardear hall pl. 4. The Iwan in the Al-Dardear hall

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 [24].

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 [1].

Second: Fustat houses (figs. 6:13)

Fustat remained a prosperous city in the Fatimid era, but it was going towards decay as Cairo expanded. Nevertheless, it was a commercial and industrial center. of its people, and ordered them to flee to Cairo, then ordered to set fires to prevent the Franks from advancing to Cairo [1], with the aim of preventing the Crusader army from controlling it, as the city's houses and buildings were devoured by the fire for forty-five days, and this

fire caused the decline of its urban star, urbanization did not extend to it despite the attempts that were made to push it to it in the Mamluk and Ayyubid eras.

The sources that recorded the stages of the prosperity of Imran Al-Fustat reveal the picture that was on the houses of Al-Fustat. Al-Maqdisi mentioned in the year 380 AH (990 AD) in his talk about the houses of Fustat as “four layers and five like pulpits, to which the light enters from the middle, and I heard that he lived in one house two hundred thousand souls.” And this is a clear reference to the vertical extension of the Fustat houses, even reaching four or five floors, and indicates that these houses were planned in the style of houses with a courtyard in the middle, which depends on lighting and ventilation for the narrow streets and railways of Fustat. Al-Maqdisi pointed to the enormity of the architecture of these houses; to the extent that one house could accommodate two hundred people [1].

NasiriKhusraw adds another dimension to the planning of those houses that are inhabited by such a large number. He says, "He heard from one of the eminent merchants that in Egypt (he means Fustat) 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." This narration reveals - despite the exaggeration in the number of room dwellers in the aforementioned palaces - that the existence of a type of houses or palaces was designed for the purpose of renting some of its rooms to such a large number of bachelors, who were abundant in the city of Fustat to work in the various fields of life. They have large incomes that help them to live alone, independently of others.

It has already been referred to the houses in the city of Cairo in the Fatimid era, whose buildings rose to several floors, NasiriKhusraw mentioned that they amounted to fourteen houses above each other, and there are houses of seven floors. It has already been pointed out that when vertical urbanization becomes apparent, 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 on which it is built, and the height of the buildings several floors requires the use of methods in Planning and construction, as well as the use of building materials to achieve these purposes, and there is no doubt that the ability to achieve this is linked to scientific progress in other fields such as architecture and others.

A great controversy arose about the history of the Fustat houses, as its history swung in the period 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 these houses we leave now and we will return to discussing it after the completion of the architectural study of these houses [1].

fig. 6. The first house in Fustat

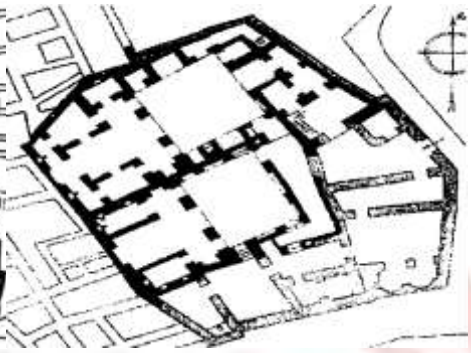

fig. 7. The second house in Fustat

fig. 8. The third house in Fustat

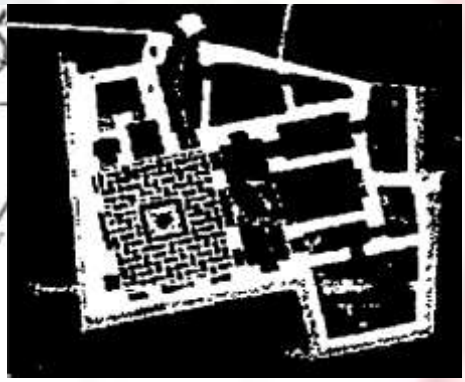

fig. 9. The fourth house in Fustat

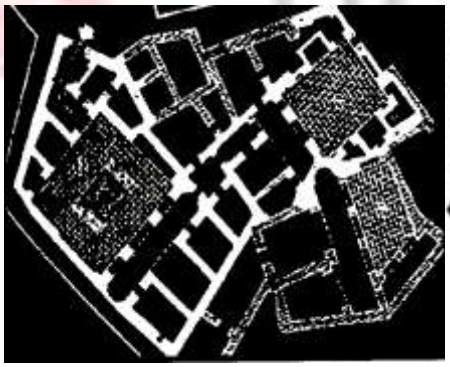

fig. 10. The Fifth House in Fustat

fig.11. The Sixth House in Fustat

fig. 12. The seventh house in Fustat

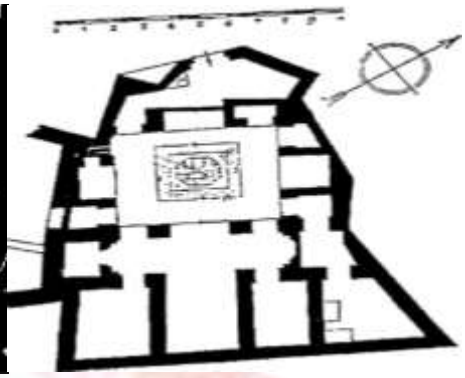

fig. 13. The eighth house in Fustat

1. Archaeological Documentation Considerations for Houses

Before we show to describe models from the houses of Fustat, it should be noted that many archaeologists when they present the architectural description of the archaeological houses, it must be noted important things related to the history of the architecture of the houses, but they are very important for the archaeological documentation of the architecture of the houses in particular [25], and among these Things that may happen in the houses, due to bequeathing or selling, may end up dividing one house into more than one house with the events of some modifications that enable this, such as blocking some openings or opening new doors, or making an entrance or corridors in addition to other modifications, the opposite can also happen, as a house is joined to another for the same reasons, and as a result of this annexation, architectural modifications occur that enable the two houses to be used as one house by connecting them to facilitate the movement of movement between the architectural units in each of the two houses [1].

Likewise, the social tradition that leads to the desire of relatives to build their neighboring houses in one area, their ownership devolves to them by inheritance, purchase, gift, or otherwise, and it is built with a comprehensive planning with one or more entrances leading to an internal corridor to which the houses open, so the group of houses looks like a 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, railings above internal corridors, internal courtyards and watercourses, and the associated water plants and channels for supplying kitchens, toilets and bathrooms, as

well as the drainage network that drains into one or more tanks, and other elements that seem to be common to achieve economic purposes in construction, in terms of material costs and space saving.

The notary 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 IbnHawqal referred, within the year 367 AH (977 AD), to the house of Abdul Aziz bin Marwan, which indicates the existence of an Umayyad house that continued to exist. Until the Fatimid era, which is something we see in many of the residential architectural monuments that still remain in Islamic cities, and they date back to previous eras next to modern buildings.

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

It is also important that the work of restoration, repair and renovation in the houses may be followed by the use of new methods, materials and techniques commonly used in periods of renewal, and did not exist in the period in which the original construction was done, and the opposite can happen, where items 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, and therefore, the reliance on some of these manifestations 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 the 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 planning the contrasting Iwans in Egyptian architecture in the Islamic era confirm this fact, despite the frequent and explicit beginning of this idea in planning in the Fatimid era, but it continued and with different formulations in different eras, and reached the peak of its development at the end of the Mamluk era, and as the idea of design develops with the

development of the formation of architectural elements According to need, this development is governed by the development of technologies and sciences that serve architecture, and this matter is of paramount importance in solving the problem of history, especially in some elements that embody a practical application of a scientific theory.

It is also important to point out that the provisions of Islamic thought dealing with the manifestations of urbanization and architecture, have their effects in shaping Islamic architecture in a manner consistent with these provisions, especially with regard to the common walls or the right to use the wall of the house to put the ceiling wood, or the installation of doors, or opening overlooks, niches and windows, Wall skylights, building ramps over roads, making wells, watering plants and mills, building driveways, and raising buildings next to low neighbors' buildings.

The relationship of these houses with its surroundings of other residential or non-residential facilities 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, and there is no doubt that realizing these aspects helps a lot in achieving the correct documentation of the houses and solving many of the mysteries of its ruins Especially the common walls.

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

2. Elements of the Fustat houses

The design of the houses took into account their suitability to 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 was also distinguished by privacy and the adaptation of its rooms in natural ways. It is the narrow streets and alleys of Fustat that were lit day and night, which made the presence of a courtyard a necessity for ventilation and also for lighting [26].

The recent study revealed that the minimum number of courtyards in one house is one

courtyard, but there are houses that include three courtyards, in which two courtyards were found in the living and reception sections, and a courtyard in the section that includes other facilities such as the kitchen and storage rooms, as found in the seventh house two courtyards [25].

The basins was also of great importance in the houses of Fustat, as it 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, as well as its aesthetic values [25].

The shed with a three-arched facade is considered one of the important planning elements in the facades of the units overlooking the inner courtyard of the Fustat houses. As hardly a single house in Fustat is devoid of the presence of such a shed, behind which are located other elements, including main vessels and rooms.The housesof Fustat was also distinguished by the presence of refractory entrances, which achieve the purpose of preventing damage to the eyes of passers-by.

The houses also included important facilities such as kitchens and storage areas, as well as toilets and bathrooms, which became clear or reduced in some houses according to the social level of the owner of the house, and the toilets, were on the ground floor in most cases and connected to the drainage directly or through channels [1].

Through the excavations that were carried out at the site of the city of Fustat, it is possible to identify the areas of the houses to a large extent, as some of the houses included rooms for rent, the area of these rooms (16 x 16 m), which is a large area [27].

A. The inner courtyard in the Fustat houses

The courtyard is one of the important architectural elements that trace its origins back to ancient civilizations in the hot region, the hot conditions of the Arab-Islamic region have led to the prevalence of this element in Islamic architecture, and the Umayyad and Abbasid palaces reflect the primary use of the interior courtyard in their layouts.

The use of the courtyard continued in the architecture of the later palaces until the end of the Ottoman era, and this continuity had its reasons, which is that the inner courtyard helps to overcome the heat of the air, especially in the summer, so that it acts as an air well, so the temperature in it is lower than the outside, which helps to move the air from the inside

to the outside of the house.

The inner courtyard coincides with the Islamic community's keenness to achieve the principle of privacy. The inner courtyard has enabled opening windows and overlooking it without having to place these windows on the outer facades overlooking the street to avoid the damage of detection.

The narrowness of the open and the unopen road in the Islamic city increased the reliance on the inner courtyards as a source of air and light, which the members of the community preferred to have the windows of their houses overlooking them without other wide main streets in which the movement of pedestrians increases, and thus the damage of detection increases as well as what happens from the noise.

The narrowness of these railways prompted the architect to plan the houses and other facilities open to the inside, and the courtyard was the original element that could achieve this purpose in order to avoid the damage of detection that occurs due to the convergence of the opposite sides, stressing the damage of disclosure in the case of opening the views of the windows in these interfaces [1].

The courtyard was used for the living purposes of the family members, and there was room for children to play in it under the care of the family, and the courtyard was employed next to all these functions as a basic element of communication and movement in the house, where traffic flows from all the wings of the house and from it to the vestibule and entrance of the house and vice versa, It's mediation of the house helped facilitate this communication.

Watering cans and water basins helped to cool the weather in the summer, and these water tanks and basins, including the water in them, could be used in the event that a fire broke out in the house for one reason or another, which means that these water tanks and basins were also one of the most important elements of protection against what The house may be exposed to 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 a basic presence, and its necessity increased that the streets and railways of the city of Fustat were mostly narrow,

with the largest width of its streets reaching six meters, while most of them reached a breadth ranging from two meters to meters, which made these streets dark during the day because the buildings on their sides were so high that they reached four or five floors.

This difficult equation between the narrow streets and roads in Fustat and the height of its buildings reveals a remarkable rise recorded by the novels, and the remains of the houses of Fustat testify for a special reason that led to the presence of internal courtyards and their breadth and multiplicity sometimes in one house, so that among the twelve houses that were previously described we do not find a single house without courtyard.

This confirms that the need for the courtyards in Fustat was essential for lighting and ventilation, without relying on the previously mentioned roads of darkness in the day and having to light them. These roads are nothing but the outer wall of the house, and perhaps what we see in the courtyards of the second house and the fifth house confirms this fact and is a clever idea from the architecture, as the width of the road overlooking the house is the space for the courtyard next to the road at the level of the second floor of the house and upwards.

The statistical study of the following inner courtyards in the Fustat houses reveals important facts that reveal the importance of the inner wall in the Fustat houses and its special features.

As for the number of yards in one house, the study revealed that the minimum is one yard, but there are houses that included three yards, such as the second house in which two yards were found in the reception and living section and a yard in the section that includes other facilities such as kitchen and storage rooms, as was found in the seventh house two courtyards, and other than that, there is one yard in every house, and if the presence of one internal yard in one house is a necessity, then the presence of more than one yard has its reasons, including the large size of the house such as the second house and the fifth house, or the irregularity of its area and taking a specific form that requires the work of two yards necessarily, even if its area is small as the first house.

A study of the area of the courtyards in the houses 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 m^2). Its inner courtyard, as was the area of the largest courtyard (130.5 m^2), which is the

courtyard of the sixth house. It is noted that this house has a large area, and it extends with a relatively large extension from north to south, which made the architect plan the rectangular courtyard of the house in the same direction as the elongation of the house in This sector is from north to south, to create one yard in an area equivalent to two yards, the architect exploited it to make a fountain, a basin for trees and an extended channel for Shadirvan, which is considered one of the most beautiful Shadirvans in houses of Fustat.This courtyard was not the only one in this house, but included in the architecture, the utility section, another large courtyard of irregular shape.

The analytical study of the orientation of the internal courtyards of the Fustat houses [1], which was previously described, reveals that six of the sixteen courtyards were directed in the northwest-southeast direction, to help receive the cool breeze in the summer, which is the correct orientation that achieves this The purpose is an ideal investigation within the framework of the study of the wind rose in Egypt in general, while facing the courtyards in the same total in a north/south direction, exactly with the original directions, and facing 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, which helps to bring the fresh breeze in the summer when the house space and placement enable him to do so, and he did not commit to achieving this vision in planning in the houses whose area and description did not allow With this orientation, he directed the courtyards further toward the northeast and southwest.

The census also revealed an investigation into the optimal exploitation of the house space. In light of this fact, it is possible to review what Criswell mentioned in this regard, as he concluded that the orientation of most of the houses was in the direction of northwest / southeast, which is clearly true, as (37.5%) of The houses were according to this direction, and the other houses that directed their houses north and south reached (31.25%), which means that (68.75%) directed a correct orientation, while what reached the north-west and southeast (31.25%), and what FaridShafi'i mentioned also can be reviewed. In this regard, as he rejected Criswell's interpretation without examining the direction of a study showing a sound statistic.

The study also revealed that the rectangular shape was the predominant form, as the number of courtyards in the houses under study was seventeen, of which nine are rectangular, two square, and six have an irregular quadrilateral shape, and here it should be noted that the predominant proportion of rectangular courtyards the length of the long side of the rectangle approximates the length of the short side, except for one courtyard, which is the courtyard of the sixth house, which showed the great difference between the length of the long side and the short side in its rectangular shape (14.5 x 9 m).

Here, it should be noted that the courtyards with irregular quadrature 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 has taken this form, such as the courtyard of the second house in the utility section, the small courtyard in the first house, and the courtyard of the utility section in the sixth house.

The study also reveals the shapes of courtyards, especially square or rectangular, that is, regular squared, that the square of the courtyard was a main axis in the planning of the houses, where the rest of the squared and then irregular elements arise in the margins of the house space respectively, and this was evident in the large-area houses that enable It can achieve this easily and without imposing an irregular square shape of the courtyard.

The irregularity of the quadrature in the courtyards of the utility and accessory sections, as in the second, third, and sixth house, reveals that the architecture was concerned with squaring the courtyards of the reception sections, to achieve their architectural aesthetics arising from this quadrature considering their function, which was not of the same importance in the sections of facilities and accessories, and reveals that on the extent of the architect's keenness 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 yard, or relatively in the middle if it has one yard, and that nine yards were placed on the side of the area adjacent to the road which the house

overlooks directly, and the units are not surrounded on all four sides by the central courtyard, and this diversity and this ratio, which is almost neutral, is primarily related to the shape and placement of the space on which this or that house was established, and the situation of the courtyard is reflected in the middle of the house surrounded by its units, in The general shape of the house from the outside, as the house whose courtyards are central, surrounds its courtyard the wings of the house on all four sides. In the case of the side courtyard, the facades overlooking this courtyard are at the level of the second floor and onwards, their shape is different. The units of the house overlook the courtyard between three sides, as in the fifth house, or two-sided as in the first house, and the fourth house.

The architecture has beautified the courtyards of houses al-Fustat in the reception departments by creating al-Fasaki with fountains, water basins, flowers and trees. The water has two of them fountains in the corners or the middle, while the number of courtyards that are devoid of the presence of such fountains is six, meaning that the percentage (54%) of the courtyards have stems and (46%) of the courtyards are without stems, a percentage that is significant if we put in Consider that the owners of small houses were not able to establish in their houses such a facility due to the cost of its establishment and the process of operating, maintaining, cleaning and filling it with water like the owners of the first and seventh houses.

If we also take into account that some houses that have more than one courtyard, the owner of which only built one fountain in one of its courtyards, as in the fifth house, then the percentage of courtyards that have two fountains seems high, and is explained by the real purpose of establishing these fountains, which is to be an element of protection for their use. In extinguishing fires that may break out in the house or any nearby house that does not have a fountain within the framework of the integration of the Islamic community to ward off danger, and we have indicated that this architectural planning has been applied in the Fatimid palaces and houses in Cairo and its presence in Fustat, which is reflected in its legs, representing the material evidence What is important for this preventive architectural vision, especially in the city of Fustat, whose narrow streets and rails do not enable them to put out fires that have a significant impact, especially since the houses were multi-storey and overcrowded with people and increased danger, so they existed within the framework of the application of the integrated system of facilities (Compact Style).

In addition to the purpose of prevention, fountains achieved in the dishes the purposes of climatic treatment by reducing the temperature, and this is evident from the large number of The basins and also from the establishment of some shades in some of the houses connected by channels to these fountains, as is the case in the third house and the sixth house. The achievement of this purpose confirmed the basins of flowers, plants and trees. This is in addition to the aesthetic values that all these elements achieve.

B. Shedwith triple interface

This style of shed facades is one of the important planning elements in the facades of the units overlooking the inner courtyard of Fustat houses, so that hardly a single house has such a shed.

There were many sheds of this type overlooking one courtyard, as we find in the first house, as there were two sheds on both sides of the courtyard of the sixth house, one on the north side and the other on the south side. The positions of the porches with three-part facades on the courtyards indicate that there is no definite direction associated with the apparent movement of the sun or wind, as these porches are found in all directions governed, of course, by the original orientation of the courtyard.

It is also important to point out that the presence of the shed was associated in all cases with the element and units located behind the shed, which were noted to include the main sheds and the surrounding rooms or other elements imposed by planning and space such as entrances, corridors, or others. The shed usually precedes the largest overlooking bays on the courtyard, which reveals a basic link between this unit, the Iwan, and the presence of a shed in front of it.

It is interesting to note that the triangular layout of the shed resonated with the units behind it, which are compliant with the main Iwan and the units that surround it. The wall included three openings, the middle and the two sides being relatively narrower. The three units behind it are the same width, and they may differ, especially the middle aperture, where the opening of the iwan is often wider than the middle aperture on its axis in the shed.

This means that the architect did not commit to the layout of the three openings of the shed

on the same axes and with the same width of the units behind them, as much as he committed to repeating the three openings, which was governed by the number of units behind the shed, which were often three.

In the context of the foregoing, it is very clear the function of this shed, as it provides a shaded area in front of the large Iwan and its surrounding units, which were often two rooms on either side of the Iwan, which adds space to this section, which can be used for various purposes, whether in the case of reception 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 take into account that this shed It is not for protective purposes from sun and rain, it can be for other protective purposes of human eyes or detection damage.

The harm of revealing may be from the guests who can be received in the houses in these sections, and the work of this shed does not allow those inside the Iwan or the two side rooms from seeing the people of the house on the upper floors, and on the other hand, it is not allowed for those on the upper floors to reveal who is in the Iwan and the two rooms on either side of it, especially since the depth of the shed was sufficient to achieve this, and here it should be noted that it is very possible for the house owner to rent one of the floors of his house in which he inhabits to strangers, and he can receive his guests in the ground houses in the main Iwan that the shed leads, and in this case the need is more urgent To protect the units behind the shed from some residents of the tenants.

This matter becomes clearer in the light of the narration of NasiriKhusraw about the houses of Cairo, whose owners used to live on the upper floor of it and rent the floors below, which means employing the ground floor in houses Fustat, often for reception, which is what IbnHawqal referred to when he mentioned that the ground floor was not used In the residential, and the presence of the reception units in it means that it is often used for this purpose and thus it is clear that the shed in the houses of Fustat was a preventive purpose to prevent the occurrence of damage disclosure, whether for those who use these units or the residents of the people of the house, whether they are owners, tenants, owners and tenants.

The style of the shed with a three-arched facade or openings was found in the two houses that were discovered in the military, and they date back to the Tulunid era. Similar examples were also revealed in the city of Samarra. It was also found in the southeastern and western houses in the houses attached to the Ukhaydir Palace, which reveals that this planning has its origins in the Abbasid architecture and Iraq, and that it mostly came from Iraq to Egypt in the Tulunid era.

C. Triple layout of other house suites

The layout of the triangular facade was reflected in the layout of the other facades overlooking the courtyard, especially the facade opposite the porch facade in the context of achieving the principle of asymmetry. It is possible to adjust the symmetry, and in the context of the above, it can be said that each interface was planned within the framework of the idea of the triple division, given that its vision is not at the same time with the other interfaces, but seeing it and then seeing others and repeating the triple division in it suggests that they are similar, and that the principle of asymmetry Achieved in the general form despite the difference in details, and here it should be noted that the compatibility and symmetry 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 the non-compliance with the triangular division what we see in some facades overlooking the courtyard and some houses, and it included four openings, not three for its layout conditions as in the first house (A).

In some cases, only two and not three were found, 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 have a shed, as one of them includes four openings, which is the eastern façade, while the western facade has only three.

These different rare examples of the general phenomenon represented by the triangular division of the courtyard facades, reveal that the architecture was not molded in its planning vision, but agreed between space and general planning, a consensus that achieves full use of the space according to its planning vision regardless of commitment to a particular form, which is a characteristic It was repeated in his schematic vision for the orientation of the courtyards, and was also represented in the different measurements and

axes of the triangular divisions of the facades overlooking the courtyard [1].

D. The shed and the triple units behind

The tripartite division of the facade of the penthouse overlooking the courtyard was connected with the units that preceded it, which were mostly three units. This connection is undoubtedly related to providing these units with the lighting and ventilation they need from the courtyard, as it is linked to the ease of communication and movement, and the provision of a degree of privacy for the two side units or any other units that may be adjacent to the middle Iwan instead of the two rooms. The seventh (b), which was built behind the shed of its courtyard, only two units consisting of an Iwan and a room, the existence of this rare case explains the conditions of the space on which it was established, which was not able to make three narrow units, so the architecture preferred to make two units, one of which is a relatively large Iwan, this example is added to the examples that reveal the flexibility of the architecture and its lack of adherence to general features in the planning that do not fit the space of the house and its general vision of its planning.

The triangular layout of the reception units represented by the Iwan is surrounded by two rooms, and this is an old layout found in the Sassanid architecture in the Shirin Palace, and it was inherited by the Abbasid architecture in Iraq, and came to Egypt in the Tulunid era, and was closely linked to the shed. The planning and the three units behind it, and he considers them to be one planning, although the three-plan units consisting of an Iwan surrounded by two rooms abounded in their examples of the similar planning, which is preceded by a shed, and we must differentiate between them, as they are two planning patterns similar in the three units, but the units preceded by a shed certainly represent an independent pattern intended to achieve Objectives - already mentioned -.

Undoubtedly, the triple schematic pattern, which is not preceded by a shed, may have been used for purposes other than the purpose of reception, such as storage, as it is customary to use crops on the ground floor for this purpose, and may be used for other purposes that do not require the work of a shed leading it, and thus it becomes clear that the units of the ground floor represented by the layouts the remaining ruins of the Fustat houses were used as reception, hospitality or storage units, and in some cases they could be used for living in houses whose owners were unable to build upper floors for harem housing, which is

consistent with what was indicated by historical sources, which indicated that the ground floors were not inhabited in The majority and preference for family housing on the upper floors to provide privacy for the harem and the people of the house in general [1].

- The two narrow sides of the shed

The classification of the layout of the two narrow sides of the shed reveals that the majority of the porches were bounded on the two narrow sides by two walls devoid of any decorative formation. Three times on each side with a beautiful architectural formation that increases the width of the shed, in addition to the aesthetic architectural values it achieves, as it is in the fifth house, the seventh house (A) and the eighth house.

In some examples, on these two sides there was a door opening that leads to a small result, as in the first house (D), the third house and the eighth house. In these cases, the shed can be considered an element of communication and movement that serves these units as well as the units behind them. Examples of this are what was found in the northern shed in the first house (C), the third shed in the courtyard of the fifth house, and the northern shed on the sixth house.

- The tripartite division of the facades in other Fatimid buildings and its relationship to the houses of Fustat

It is important to point out that the architecture in the Fatimid era has used the triple division that was previously referred to in other types of buildings that date back to the Fatimid era, especially in the architecture of the scenes, and in a manner similar to the division of houses Fustat, in which the middle opening is wider than the two sides, and we see examples of this are in the facade of the qiblaRiwaq in the mosque andMarqab al-Juyoushi, the facade of the scene of Kaltham, the facade of the Yahya al-Shibh mausoleum, and the scene of SayyidaRuqayya.

But the function of the impact and the function of the shed is different from what is in the houses of Fustat, as it was found in the fortress of Deir al-Muharraq and the fortress of Anba Antonius, which date back to the Fatimid era inside the Angel Church, each of which is inside an internal partition established in the same form consisting of a three-arched porch, the middle of which is the widest and the highest of the two knots. The two sides,

which indicates that the triple division was among the architectural vocabulary in the Fatimid era, and was employed in each facility according to the conditions 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 [1].

E. Bent or indirect entrance in Fustat houses

The bent entrance was originally a military architectural element known in the ancient Egyptian military architecture in Shunat al-Zabib. It dates back to the period between the years (2625-1788 BC). It was also known in Samharam in the Sultanate of Oman in one of the entrances leading to the castle. This example is due to the 4thcentury AD, and it was used in Islamic architecture at the entrances of Baghdad, as it was found in the Fatimid era at the gates of Cairo in the northern wall, and then was used in the Ayyubid and Atabeg architecture, and its use was developed in the military architecture in the Maghreb and Andalusia in the 7-8 centuries AH (13-13). 14AD), where the doors with facilities were more than broken, and the Byzantines use it it in the fortifications of Ankara in 245 AH (859 AD) after the Abbasid Caliph Al-Mu'tasim attacked it, who destroyed it in 224 AH (838 AD), meaning that the ancient Egyptian and Arab architecture as well as the Abbasid Islamic preceded it,in their use of this element of the military architectural schematic [1].

The planning of the bent entrance in the military architecture was for the attackers to turn left, so that their right would be exposed, and their arms and usually sword-wielding hands would be easy to strike, as the warrior held his sword in his right and his shield in his left, a layout different in form and function from the planning of the bent entrance in the houses, where the bent entrance in the houses serves two important purposes: one is to achieve the purpose of protecting the eyes of people passing by, from revealing who is inside the house if the outside door is opened, and this was the main purpose, and there are those who believe that this bent entrance was to increase the chances of defending the house if internal or external disturbances or strife arise.

The study of the entrances to houses Fustat reveals that the architecture mostly plans the entrances to the houses in the bent Entrance in various forms, mostly related to the shape and space of the place on which the house arises more than it is related to something else.

The bent entrance may be a turning corridor once or more until the interior reaches the courtyard of the house, and the layout of the corridor may be regular, and the space may impose narrowness in some places and wideness in other locations, as in the entrance of the third house and the eighth house.

The refraction of the entrance may also be achieved through the planning of the entrance in its form of successive and regular square gates, which take openings that connect them with different axes and form a totality of a bent entrance. The door leads to a room that ends in a second room, next to it are two openings, the eastern door leads to a spacious room that enters the first house (A) and the western one leads to the room that leads 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 and fifth and the sixth houses.

Among the simple models in the southern entrance and the eastern entrance with this layout 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 the diagonal hall, it helped to make the inner opening that leads to the courtyard in a shape 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 recessed shape, but lead directly to the courtyard of the house, and it is noted that the architecture implemented this type of entrance in response to the space of the house and also in connection with laying the road that overlooks this area and from the houses with direct entrances the first house) C and the first (D), and the entrance to the seventh house (A) and the seventh (B).

There is also another type of direct entrance that did not need to be formulated in a refractory form, which are the entrances that lead to the warehouses in the first house (C), as well as the entrance that leads to the utilities and accessories section in the sixth house, and this type of direct entrances confirms that the broken 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 ways the house overlooked, and on the other hand was linked to the functional purpose of this or that

entrance, and from the houses that included more than one entrance to the first house (A), which It is noted that three of the entrances were linked to access from an impermeable road and an effective road, and one of them is the northeastern entrance on the impenetrable road was for the entry of goods that are stored in warehouses in this sector of the house, which was mostly for a commercial purpose, as well as the third house that was established It has two bent entrances on two roads overlooking the house and the sixth house. The southern entrance was allocated to reach the main sections of the house, while the eastern entrance was allocated to enter 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 doors or entrances to the houses directly opposite, and also reveals the concern for the dimensions of the successive entrances from each other, and their planning in a way that does not cause damage to disclosure. And we notice this in the entrance leading to the warehouses in the first house (C) and the next entrance to it at the front of the impenetrable road, as well as the entrances to the seventh houses (A-B).

The southeastern entrance to the first house (A), and the entrance to the first house (b) corresponding to it from the eastern side, reveals that although the two doors are placed on two sides, one spacious, but it was taken care not to reveal each other, and this phenomenon in houses Islamic cities is a basic phenomenon in planning known in cities Islamic investigation to prevent the harm of disclosure.

In the light of the foregoing, it becomes clear that the generalization is wrong, that the houses of Fustat have their entrances broken.It is also clear that the layout of the recessed entrances differs from the layout of the recessed entrance, which arises in front of the city gates, as the construction of the bachoura is in the form of an intercepting wall in front of the city gate, a form that differs from the schematic form of the recessed entrance in the entrance of the house inside the opening of its door to the opening that ends 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 was not able to 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 actually two houses.

This study showed that the main axis of planning proceeds in the square of the courtyard, squaring it regularly, and squaring the main units overlooking it, starting from the shed and the main Iwan, in the rooms on its two sides, then the units overlooking the courtyard from the other sides, then accommodating the irregular squared spaces in the outer margins of the space the house.

It is noted that the general planning is divided into two types: a pattern consisting of a triangular plan with an Iwan surrounded by two rooms and preceded by a shed, which is the layout that was found in the Tulunid houses that were discovered in the army, as well as in the houses of the Ukhaydir Palace and the houses of Samarra, which is of Iraqi origin and came to Egypt in the Tulunid era. This layout developed in some of the houses that took the explicit form with four iwans overlooking the courtyard, one of which precedes a shed. This is the layout that crystallized in the Western Palace on which the Bimaristan of Qalawun was built, and this layout was fully illustrated in some houses, and only two iwans were found in some of the houses. I also found three in some cases, and the important thing is that the Iwan began to develop into a clear form.

One of the more advanced planning features is the use of one of the Iwans as a place for a chador or making a room behind the Iwan for the same purpose. With the clarity of this planning, however, some of the iwans were opened to the two side rooms and the rooms behind the Iwan to provide alternative corridors that provide a second line of passage other than the main traffic line of the courtyards. This development has no parallel in the two houses that date back to the Tulunid era.

If we link these advanced features in planning with the stucco decorations referred to by Creswell, which were found in the eighth house, it becomes clear that the houses of Fustat are likely to be attributed to the Fatimid period.

In the context of the functional division of the house, Criswell pointed out that the two courtyards overlooking the reception units were planned in the framework of the concept of allocating a suite for the harem “Hearmlek” and the other for the men “Salamlek”, a division that crystallized in the houses in the Ottoman era, and it reflects the culture of

Ottoman Turkish in the first place, but it was not, as FaridShafi'i mentions, also in the houses in Fustat, where it tends that the harem were inhabiting the upper floors of the houses, and these floors included the bedrooms, while the Iwans and other units in the ground houses were intended for reception and hospitality. .

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

As for the facilities and rights that are attached to houses such as kitchens, storage crops and stables, it is noted that they emerged in some houses and shrank in other small houses, and this matter is definitely related to the social level of the owner of the house, and it turns out that some of the houses included such facilities, and Creswell and FaridShafei did not notice that they were theoretical references depending 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 architecture's awareness of the wind cycle and placed them in the southern, southeastern or southwestern positions, but in other cases he had to place them on the northern side, obliged to link such places The elements with the rail that the house overlooks to facilitate the lifting 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 the bent entrances to provide privacy for its users. It is also noted that there are channels in the walls to drain water from similar units to the upper floors, which is evidence of the presence of more than one floor in these houses, and if the bathrooms are scarce. Being on the ground floor on which this study was conducted, the upper floors had bathrooms more densely given that they were adjacent to the bedrooms, and this is likely to be 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 both of

them included shops, and that the first house (A) included stores for goods sold in the three shops attached to this house mostly, and it records an early model for shops in houses Fustat, the commercial city of Egypt in the Fatimid era, is an example that was repeated in the Ottoman era in the houses of Rashid, which indicates the continuation of the idea of attaching shops to the house that is located on open roads.

3. General features of houses

If we put the same scale plans of the main part of each house one by one, we find an astonishing degree of similarity at first sight, and in each case we find a rectangular courtyard of varying dimensions, and on one side of this courtyard there is a plan of three arches, the middle arch of which is wider than the two side arches, and the arches rest on rectangular pillars made of bricks. These three arches form a shed, behind which is a room whose depth is greater than its width. It agrees with the middle arch, with a smaller room to the right and left, and it opens to the shed, but without direct contact with the side rooms, and on the other three sides. , there is a room placed on a central axis with an entrance or opening to the right and left, and the main axis generally runs from north-east to south-west, and there are two right-angled houses (Bachoura or bent entrance) that generally leads in the entrance to these side openings so that it is not possible to Viewing the courtyard from the street or the unit used at work, Gabriel shows the 64 cm working arm that appears to have been in use.

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

- The width and thickness of the main walls which may often reach a meter.
- The use of stone and brick in the construction of the main walls and facades of buildings.
- The presence of a staircase ascending stairs to the top.
- The presence of main drainage channels of square or rectangular section that were left inside the back wall during construction, especially near the toilets or in the walls themselves.
- The presence of round-section pottery pipes buried inside the walls, the cleanliness of

which indicates that they were used with pure water.

- Some large houses may contain mosques, baths and their people.
- Some of the houses were surrounded together by a single wall, such as the first house, which turned out to contain four houses, as well as the seventh house, which is in fact two houses [25].

The transverse shed has three arches and behind it three parallel chambers that open the middle to the roof in full width, a system that is called the pattern of the hall in the form of an inverted (T) shaped, we find it here as we found it in Al-Ukhaidir Palace on the northern and southern sides, which we do not find in Fustat. In addition, the Levantine planning as we see it in Qastal, QasrKharana, Al-Mashatta and Al-Touba was completely different, and therefore it can be said that the planning that we see in Fustat was transferred from the Arabs, perhaps in the Tulunid era [25].

4. Construction items and materials

The houses of Fustat were built for wages with mortar of lime and Qasrmal, and it is noted through the study of the construction method, especially the construction of a course, the bricks are placed on its narrow side every four or five courses and repeating that, and comparing that to the method of building Fatimid buildings that are analogous to factories and ovens in the region south of the White Monastery in Sohag, as well as the style of building forts in some monasteries dating back to the Fatimid era represents a presumption that is added to the clues that suggest the attribution of these houses to the Fatimid era.

As well as the use of plaster and bricks in the decoration of some houses, and many of these pieces were found that are kept by the Museum of Islamic Art. The first is from the Fatimid era on wood and Fatimid decorations, then it began to develop.

Also, some of the decorations in the pieces are similar to the decorations on some of the Fatimid antiques transferred as calendars, as well as the decorations of the rosettes inside the squares, and the method of implementing stucco decorations, of which thin brick molds are preferred, is a style that Criswell asserted is a style in the decorations of Seljuk origin, and he referred to examples that go back to The first half of the 6th century AH (12 AD), as previously mentioned, which adds further evidence that the decorations of these houses

date back to the sixth century AH.

In the context of the above, it is possible to review what Abbas Helmy mentioned about the houses of Fustat dating back to the 3th century AH (9th century AD), an opinion rejected by FaridShafi'i, as well as the rejection of the broad framework for the history of these houses to know that Bahjat and Gabriel have a history that accommodates the period confined between the 3rd century. 5th AH (9-11 AD), and he tried to attribute some of the houses to the Tulunid era, as they are similar 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, construction methods and decoration, it is likely that these houses are attributed to the Fatimid era Akbar, and some of them, such as the eighth house, date back to the first half of the 6th century AH (12AD) [1].

Conclusion

- 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 comparable to the western palace in its planning, and the strength of each of them was a central courtyard surrounded by two iwans, and the halls were distinguished by the presence of two opposite iwans between them and a courtyard.
- The design of the houses took into account their suitability to 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 was also distinguished by privacy and the adaptation of its rooms in natural ways. It is the narrow streets and alleys of Fustat that were lit day and night, which made the presence of a courtyard a necessity for ventilation and also for lighting.
- The recent study revealed that the minimum number of courtyards in one house is one courtyard, but there are houses that include three courtyards, in which two courtyards were found in the living and reception sections, and a courtyard in the section that includes other facilities such as the kitchen and storage rooms, as found in the seventh

house two courtyards.

- The shed with a three-arched facade is considered one of the important planning elements in the facades of the units overlooking the inner courtyard of the Fustat houses. As hardly a single house in Fustat is devoid of the presence of such a shed, behind which are located other elements, including main vessels and rooms. The houses of Fustat was also distinguished by the presence of refractory entrances, which achieve the purpose of preventing damage to the eyes of passers-by.
- The houses also included important facilities such as kitchens and storage areas, as well as toilets and bathrooms, which became clear or reduced in some houses according to the social level of the owner of the house, and the toilets, were on the ground floor in most cases and connected to the drainage directly or through channels.

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