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The American University in Cairo

School of Humanities and Social Sciences

**The Sources of Ibn Tulun's Soffit Decoration**

A Thesis Submitted to

Department of Arab and Islamic Civilizations

Islamic Art and Architecture

in Partial Fulfillment of the Requirement for  
the Degree of Master of Arts

by

**Pamela Mahmoud Azab**

Under the Supervision of **Dr. Bernard O'Kane**

December 2015

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## Abstract

Ornamental decoration has been studied extensively by various art historians who have provided a multitude of interpretations for the underlying reasons behind the use of different ornaments as well as the influence different eras had on the design of ornament. Stucco played an important role as a decorative element used throughout the ages; it is considered an inexpensive way of decoration as well as a speedy one. Stucco decoration was also perceived by some to convey special meaning and has been analysed from an architectural as well as a geometrical perspective.

This thesis proposes to examine the source of the stucco decoration of the mosque of Ibn Tulun's soffits according to their pattern. Some previous scholars have attributed them to Byzantine sources, others to Abbasid Samarra. This study will attempt to determine where the closest parallels lie. It will also trace the origins of the patterns, examining the question of whether the Samarra patterns are completely original, or whether they in turn are indebted to Byzantine or Roman prototypes.

## Introduction

The mosque of Ahmad ibn Tulun is one of the most important mosques in Egypt. It is the second largest mosque in Cairo, the third congregational mosque; it was built in 876 by Ahmad ibn Tulun. The most striking feature of the mosque is its stucco decoration. There is no evidence of the presence of this style of stucco, which was strongly influenced from Samarra, in any other monuments in Egypt; the mosque of Ibn Tulun is the only monument standing today in Cairo which has this style of stucco apart from the remains of a small Tulunid *hammam* that was discovered in 1932 and was decorated with stucco.<sup>1</sup> The stucco designs on the soffits while being strongly influenced by Samarra, arguably display also Roman and Byzantine influences. The soffits are carved with intricate abstract floral designs very similar to Samarra stucco, but in a geometric framework that shows Roman and Byzantine influence as well. Both geometric and vegetal patterns are found which when combined lead to countless varieties of ornamental patterns are of late antique times.<sup>2</sup> Samarra styles A and B (explained in chapter two) represent an evolutionary process that underwent a development from Sasanian stucco until it was employed at Ibn Tulun; for example the vine scroll transformed gradually from a naturalistic pattern into an abstract pattern.<sup>3</sup> The analysis of Roman and Byzantine mosaics will indicate a connection to the patterns used in Ibn Tulun. This has been noticed by earlier scholars. According to Ernst Diez, the geometric patterns of Ibn Tulun mosque show the influence of Roman mosaics from late antique times as well as that of

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<sup>1</sup> Ibrahim, "Tulunid Hammam", 35.

<sup>2</sup> Diez, "Simultaneity", 187.

<sup>3</sup> Dimand, "Islamic Ornament", 295.

Sasanian stucco.<sup>4</sup> According to Doris Behrens-Abouseif, the decoration of Ibn Tulun's mosque shows a strong influence of Byzantine and Samarran works of art.<sup>5</sup> She also mentions that Sasanian culture inspired the works of the Abbasids and that both the Byzantine and Sasanian cultures contributed to the evolution of the naturalistic floral and abstract decorative patterns.<sup>6</sup> Some of the motifs like the herringbone border, pearls and spiral are Byzantine and were used later by Mesopotamian and Coptic artists.<sup>7</sup> The geometric patterns can be generated by using some fundamentals of mathematics. For example by using circles and connecting the centers with straight lines a triangular grid with a symmetrical pattern can be achieved, and by connecting the centers in a triangular grid, a rhombic or a hexagonal grid can be achieved.<sup>8</sup>

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<sup>4</sup> Diez, "Simultaneity", 187.

<sup>5</sup> Behrens-Abouseif, *Islamic Architecture*, 56.

<sup>6</sup> *Ibid.*, 57.

<sup>7</sup> Hassan, *Les Tulunides*, 307.

<sup>8</sup> Bier, *History of Mathematics*, 837.

## Chapter 1

### Historical Background

#### 1.1 Historical Background of Ibn Tulun

Ahmad ibn Tulun was the founder of the Tulunid dynasty that ruled Egypt from 868-905; he was born in Baghdad in 835. Ibn Tulun's parents were Turkic slaves; his father was sent to Baghdad as a present from the governor of Bukhara in 815<sup>9</sup> where he served in the army and became the commander of the caliph's private guard. In 850, Ibn Tulun's parents moved to Samarra where he studied theology and was trained in the army. In 855, Ibn Tulun became the commander of Special Forces for the caliph; he also served in many campaigns against the Byzantine Empire. In 868 when his stepfather Amir Bakbak was given the fief of Egypt he sent Ahmad ibn Tulun as his deputy to Egypt. Ibn Tulun's position in Egypt then was as a regent to the governor. In 869 Bakbak was succeeded by Yarjukh, Ibn Tulun's father-in-law, and in 870 Yarjukh appointed Ibn Tulun governor of Egypt.<sup>10</sup> Two years later he appointed his son al-Abbas governor of Alexandria.<sup>11</sup> In 874, Ibn Tulun declared the independence of Egypt and established an autonomous Egyptian Muslim army for the first time.<sup>12</sup> In 875 he stopped sending money to Samarra and used the revenues to improve agriculture and industry; he also made administrative reforms and improved some public works.<sup>13</sup> In 877 the caliph sent troops under al-Muwaffaq, governor of Damascus, to take over Egypt but they were defeated by the larger army of Ibn Tulun; countless skirmishes

<sup>9</sup> Briggs, *Muhammadan Architecture*, 48.

<sup>10</sup> Corbet, *Life and Works*, 529-530.

<sup>11</sup> Bianquis, *Autonomous Egypt*, 92.

<sup>12</sup> [http://www.brillonline.nl.library.aucegypt.edu:2048/entries/encyclopaedia-of-islam-2/ahmad-b-tulun-SIM\\_0398](http://www.brillonline.nl.library.aucegypt.edu:2048/entries/encyclopaedia-of-islam-2/ahmad-b-tulun-SIM_0398)

<sup>13</sup> <http://islamicceramics.ashmolean.org/Abbasid/ibntulun.htm>

lead to the occupation of a large part of Syria; Damascus, Homs, Hama and Aleppo in 878;<sup>14</sup> but Ibn Tulun's campaign in 883 to occupy the Hijaz and the Holy cities failed.<sup>15</sup> During the absence of Ibn Tulun his son al-'Abbas revolted, his aim being to take over Egypt and be the leader of Ifriqiya, but was defeated by the governor of Tripoli in 880, and was captured and imprisoned in Fustat. In 881 Ibn Tulun declared his younger son Khumarawayh to be his successor.<sup>16</sup> In 883 Ibn Tulun led a campaign to Tarsus and put the city under siege but he was overpowered and withdrew to Adana and then to Massissa. He fell ill there and was taken to Egypt.<sup>17</sup> Ibn Tulun ruled until his death in 884, leaving a vast amount of money in the government treasury.<sup>18</sup> He was the first to establish a rule over the region that the Fatimids, Ayyubids, Mamluks and Mohammad Ali controlled later.<sup>19</sup> Ibn Tulun's government had a crucial impact on Egyptian history for centuries to come. For the first time a Turkish general established an independent dynasty that was strongly tied to a region.<sup>20</sup> He was able to unite vast regions and various ethnic and religious groups and compatible economies to shape a new urban-based society that was able to rule despite the varied identities of his subjects.<sup>21</sup>

The Tulunid dynasty soon collapsed due to Khumarawayh's excessive spending. He expanded his father's palace, built pavilions and gardens and transformed the *maydan* into a park,<sup>22</sup> and installing a fountain filled with mercury.<sup>23</sup> In addition to funding his luxurious court life he had to pay a large amount of annual tribute to the Abbasid caliph.<sup>24</sup> He was

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<sup>14</sup> Bianquis, *Autonomous Egypt*, 95.

<sup>15</sup> [http://www.brillonline.nl.library.aucegypt.edu:2048/entries/encyclopaedia-of-islam-3/ahmad-b-tulun-COM\\_23565](http://www.brillonline.nl.library.aucegypt.edu:2048/entries/encyclopaedia-of-islam-3/ahmad-b-tulun-COM_23565)

<sup>16</sup> Corbet, *Life and Works*, 550.

<sup>17</sup> Bianquis, *Autonomous Egypt*, 102.

<sup>18</sup> <http://academic.eb.com.library.aucegypt.edu:2048/EBchecked/topic/180382/Egypt/22361/The-Tulunid-dynasty-868-905?anchor=ref306942>

<sup>19</sup> Raymond, *Cairo*, 26.

<sup>20</sup> Bianquis, *Autonomous Egypt*, 103.

<sup>21</sup> *Ibid.*, 104.

<sup>22</sup> al-maqrizi, *al-Mawā'iz*, 2:88.

<sup>23</sup> *Ibid.*, 89.

<sup>24</sup> Tulunid. (2009). In *Encyclopedia of Islamic Art and Architecture*, 354.



assassinated in 896 leaving an empty treasury, there was not even enough money to pay the army.<sup>25</sup> His teenage successor had no authority; the country fell into turmoil and the palace was plundered and burned.<sup>26</sup> In 905 the Tulunid dynasty was put to an end by the Abbasids after a campaign by the general Muhammad Sulayman al-Khatib.<sup>27</sup> The remaining Tulunid family members were imprisoned in Baghdad.<sup>28</sup>

## 1.2 Background of Ibn Tulun Mosque

When Ahmad ibn Tulun arrived in Egypt, he found out that al-Fustat was not large enough to accommodate his armies. At that time al-Fustat and al-‘Askar were fused into a large city<sup>29</sup> that was a successful amalgamation of al-Fustat and al-‘Askar.<sup>30</sup> In 750 the Abbasid dynasty founded their settlement al-‘Askar north of al-Fustat and below Jabal Yashkur. Ibn Tulun decided to create a new city which was called al-Qata’i‘ (fig. 1.1); it was built a short distance northeast of al-‘Askar on higher ground where there had been a Jewish and Christian cemetery, which had been completely destroyed.<sup>31</sup> The city was laid out in a grand style, including a large public square (*al-maydan*), a hippodrome, a palace for the governor (*Dar al-Imara*) that was attached to the qibla side of the mosque, and a large ceremonial mosque. It also included barracks for soldiers, administrative buildings, baths, gardens, a hospital, mills, bakeries, a suq and houses. Plots of land were distributed to government officials and military officers, hence the name of the city which was divided into fiefs, called *qata’i’*.<sup>32</sup> The new city expanded until it joined al-‘Askar to the south.<sup>33</sup> There were several gates leading to the palace and the public square, each one having a

<sup>25</sup> <http://academic.eb.com.library.aucegypt.edu:2048/EBchecked/topic/180382/Egypt/22361/The-Tulunid-dynasty-868-905?anchor=ref306942>

<sup>26</sup> Tulunid. (2009). In *Encyclopedia of Islamic Art and Architecture*, 354.

<sup>27</sup> Swelim, *Mosque of Ibn Tulun*, 5.

<sup>28</sup> Corbet, *Life and Works*, 550.

<sup>29</sup> Behrens-Abouseif, *Islamic Architecture*, 5.

<sup>30</sup> Gordon, “Ibn Tulun”, 65.

<sup>31</sup> al-maqrizi, *al-Mawā’iz*, 2:85; Raymond, *Cairo*, 26.

<sup>32</sup> Gordon, “Ibn Tulun”, 68.

<sup>33</sup> Corbet, *Life and works*, 531.

different name. One of the main gates was named Bab-al-Siba‘; it had a *majlis* above it. The triple gate called Bab al-Maydan was used only by Ibn Tulun.<sup>34</sup> Some of the other gates included Bab al-Salat, Bab al-Sawalija, Bab al-Khasa, Bab al-Jabal, Bab al-Daramum, Bab al-Danaj and Bab al-Saj.<sup>35</sup> He also built a well and an aqueduct which brought water from Birkat al-Habash to the palace<sup>36</sup>, the Jazira fortress, and the Tannur mosque.<sup>37</sup> He restored the lighthouse of Alexandria and the Nilometer. Unfortunately the city was destroyed in 905 by the Abbasids; the mosque survived and some Tulunid residences were left unharmed in al-‘Askar.<sup>38</sup> But the mosque endured long periods of dilapidation, the area declined during the crisis of 1066-1073 then destroyed in the fire of al-Fustat in 1167.<sup>39</sup> In 1932 remains of a Tulunid *hammam* belonging to a residence was discovered in the area between al-Fustat and al-Qata’i‘ that was decorated with stucco.<sup>40</sup> All of Ibn Tulun’s *emirs* built their houses north of al-‘Askar and al-Fustat. Al-Fustat and al-‘Askar were linked to al-Qata’i‘ by a *suq* from Kum al-Garih reaching the mosque of Ibn Tulun.<sup>41</sup>

The mosque was greatly influenced by the Samarran examples; it was built in monumental proportions in brick and decorated in stucco. It was started in 876 and completed in 879 on a hill called Yashkur at the center of al-Qata’i‘; people believed that this hill was holy and that prayers were accepted there.<sup>42</sup> The total cost of the mosque was 120,000 *dinars*.<sup>43</sup> People initially refused to pray at the mosque because they did not know the source of the money, they were reassured when Ibn Tulun told them that he found a

<sup>34</sup> al-maqrizi, *al-Mawā‘iz*, 2:86.

<sup>35</sup> Ibid., 86.

<sup>36</sup> Raymond, *Cairo*, 27.

<sup>37</sup> Abdul Wahab, *History of Ancient Mosques*, 34.

<sup>38</sup> Ibrahim, “Tulunid Hammam”, 45.

<sup>39</sup> Ibid., 45.

<sup>40</sup> Ibid., 35.

<sup>41</sup> Ibid., 45.

<sup>42</sup> Creswell, *Early Muslim Architecture*, 2:333.

<sup>43</sup> al-Balawi, *Sirat Ahmad ibn Tulun*, 350.

treasure of 1,000,000 dinars in the desert while he was riding.<sup>44</sup> According to Creswell he made up this story to disguise the fact that he kept the tribute money that was supposed to be sent to Baghdad,<sup>45</sup> probably a legend for the Egyptians would have been happy to keep their money in the country.

Ibn Tulun's mosque is almost square, measuring 162 meters in depth and 162.46 meters in width<sup>46</sup>, while the main prayer area is rectangular (fig. 1.2). The mosque has an open court surrounded by four riwaqs. The qibla side has five arcades parallel to the qibla, while the other three sides have two arcades. The main mihrab is located in the middle of the qibla wall. The mosque is surrounded by a *ziyada* on three sides; each *ziyada* measures about 19 meters in width.<sup>47</sup> The *sahn* of the mosque is almost square, measuring about 92 meters a side.<sup>48</sup> There is a Mamluk domed ablution chamber in the middle; an original domed fountain was burned in 986. In 995 a new dome was built by the Fatimid caliph al-Aziz<sup>49</sup> and in 1296 Lajin replaced it with a domed ablution fountain.<sup>50</sup> The original fountain was made of marble with a gilded dome and marble columns connected with a wood banister,<sup>51</sup> it was an ornamental in character; the ablution chambers were located outside the mosque proper for hygienic purpose.<sup>52</sup> The ablution chamber (*mida'a*) was located on the north-west side in the *ziyada* outside the mosque proper.<sup>53</sup> Behind the ablution chamber was a room filled with medicine and a doctor present every Friday prayer for emergency.<sup>54</sup> The minaret is located in the northern *ziyada*; "al-Qudai...says that it was copied from the minaret of Samarra."<sup>55</sup> It

<sup>44</sup> Corbet, *Life and Works*, 533; Creswell, *Early Muslim Architecture*, 2:329, 336.

<sup>45</sup> Creswell, *Early Muslim Architecture*, 2:336.

<sup>46</sup> Creswell, *Short Account*, 395.

<sup>47</sup> *Ibid.*, 395.

<sup>48</sup> *Ibid.*, 393.

<sup>49</sup> Ali, *Arab Contribution*, 62; Briggs, *Muhammadian Architecture*, 51.

<sup>50</sup> Creswell, *Early Muslim Architecture*, 2:334.

<sup>51</sup> Ali, *Arab Contribution*, 62.

<sup>52</sup> Creswell, *Early Muslim Architecture*, 2:334; Corbet, *Life and Works*, 36-7.

<sup>53</sup> Creswell, *Early Muslim Architecture*, 2:334.

<sup>54</sup> al-Maqrizi, *Khitat*, 2:266.

<sup>55</sup> Creswell, *Short Account*, 405.

consists of four storeys, the bottom part is square with an outside staircase, the second storey is circular with an outside staircase, the top two storeys are slightly octagonal.<sup>56</sup> In 1920 by digging a horizontal trench into the minaret it showed no break in the masonry this proved that the minaret was built by Lajin.<sup>57</sup>

The *ziyada* is slightly lower than the mosque on the side away from Jabal Yashkur; it isolates the mosque proper from the outside noises of the street.<sup>58</sup> The outer walls of the *ziyada* have a unique crenellation of an interlocking design made of plastered brick. Originally there were latrines and an ablution area in the *ziyada*.<sup>59</sup>

The interior of the mosque consists of a *sahn* with thirteen pointed arches on each side; these arches are decorated with a continuous band of stucco ornament. The soffits were all decorated with stucco. Above every pier there are small open pointed arched niches. Every spandrel has a sunken rosette. A broad frieze of stucco rosettes runs above the arches of the *riwaq* façades.<sup>60</sup> Inside the mosque there are rows of delicate lacework stucco windows,<sup>61</sup> according to Creswell only three are original.<sup>62</sup> The mosque has six mihrabs; the original main mihrab is in the middle of the qibla wall. It is a simple concave niche with a frame around it; there is a *kufic* script above the niche containing the *shahada*.<sup>63</sup> The other five mihrabs are later; one is on the qibla wall to the left. There are two mihrabs flanking the *dikka* on piers, the other two are on the first arcade in from the courtyard.<sup>64</sup> The one on the right was placed by al-Afdal Shahinshah in 1094 and the mihrab on the left pier is a copy of this by Sultan Lajin.<sup>65</sup>

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<sup>56</sup> Creswell, *Short Account*, 403.

<sup>57</sup> *Ibid.*, 405.

<sup>58</sup> Briggs, *Muhammadan Architecture*, 396.

<sup>59</sup> Creswell, *Short Account*, 395.

<sup>60</sup> *Ibid.*, 343.

<sup>61</sup> *Ibid.*, 345.

<sup>62</sup> Creswell, *Early Muslim Architecture*, 2:347.

<sup>63</sup> Williams, *Islamic Monuments*, 65.

<sup>64</sup> *Ibid.*, 65.

<sup>65</sup> Williams, *Islamic Monuments*, 65.

The mosque underwent several restorations. It was restored by the Fatimids in 969-1176. The caliph al-‘Aziz constructed a new fountain after it was burnt in 986<sup>66</sup>, minor restorations were done in 1077<sup>67</sup> and in 1094 al-Afdal added the stucco mihrab mentioned above.<sup>68</sup> In 1296 Sultan Lajin made many reconstructions, additions and restorations.<sup>69</sup> Some of these include paving, whitewashing, rebuilding the domed fountain and part of the minaret, a copy of al-Afdal’s stucco mihrab, a minbar, a sundial, lining the mihrab with mosaic and marble and building a room behind the mihrab.<sup>70</sup> He established a *madrassa* system teaching Quran, *hadith*, *fiqh*, *tafsir*, law and medicine.<sup>71</sup>

Many restorations were made by the Comité de Conservation des Monuments de L’Art Arabe. The Comité was established by Khedive Tawfiq in 1881, to conduct the conservation of Islamic and Coptic monuments.<sup>72</sup> The Comité tried to documented all the monuments in Egypt, the state of repair of each monument and the action that should be taken. Each meeting was documented in bulletins written in French. In 1918 King Fu’ad attended the Friday prayer to revive the mosque to its former function.<sup>73</sup> In the *Bulletin* of 1926<sup>74</sup> it was written that it was decided to restore the stucco ornaments according to the original ones,<sup>75</sup> and to clear all the buildings and workshops that were attached to the mosque’s walls.<sup>76</sup> In 1951-52, the stucco decoration of the arches were restored.<sup>77</sup> In 1978-79, the Egyptian Antiquities Organization (E. A. O.) repaired the stucco of the façades, paved the courtyard with pebbles, restored the ceiling and the dome above the mihrab and

<sup>66</sup> Creswell, *Early Muslim Architecture*, 2:333.

<sup>67</sup> Ibid., 336.

<sup>68</sup> Ibid., 336.

<sup>69</sup> Swelim, *Mosque of Ibn Tulun*, 5.

<sup>70</sup> Creswell, *Early Muslim Architecture*, 2:337.

<sup>71</sup> Ibid., 337; Swelim, *Mosque of Ibn Tulun*, 132.

<sup>72</sup> <http://www.islamic-art.org/comitte/Comite.asp>

<sup>73</sup> Swelim, *Mosque of Ibn Tulun*, 158.

<sup>74</sup> <http://www.islamic-art.org/Comitte/BArchViewPage.asp?BookID=732&PO=81>

<sup>75</sup> Swelim, *Mosque of Ibn Tulun*, 164.

<sup>76</sup> <http://www.islamic-art.org/Comitte/BArchViewPage.asp?BookID=732&PO=78>

<sup>77</sup> Swelim, *Mosque of Ibn Tulun*, 174.

they added electric lamps.<sup>78</sup> In 2004 some major restorations were done, a complete restoration of the ceiling by adding new waterspouts and isolating roofing system, restoration of the dome above the mihrab, the mihrabs, the minbar, the rooms behind the mihrabs, the stucco and the open courtyard was paved.<sup>79</sup>

The mosque suffered some severe acts of vandalism. As early as 1184 it was used as a shelter for travellers,<sup>80</sup> Maqrizi mentions that it was a caravan stop for Moroccan pilgrims.<sup>81</sup> During the reign of sultan Baybars a part of it was used as a bakery.<sup>82</sup> In 1846 Clot Bey walled up the arches to form cells to transform it into a lunatic asylum.<sup>83</sup> In 1850 it was used to accommodate dervishes and their families.<sup>84</sup> In 1862 an English woman by the name of Mrs. Austin wrote a letter from Egypt stating that the mosque had been turned into living quarters for poor Turkish and Arab families.<sup>85</sup> The mosque was used as a poor house until 1880. Finally, in 1890 the Comité removed the walls that were built by Clot Bey.<sup>86</sup> At that time there was a fee for visiting the mosque.<sup>87</sup> In 1918 it was again used as a mosque when King Fu'ad attended a Friday prayer.<sup>88</sup> In 1926 “the technical department of the Comité became aware of the importance of the mosque archaeologically.”<sup>89</sup>

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<sup>78</sup> Swelim, *Mosque of Ibn Tulun*, 174.

<sup>79</sup> Swelim, *Ibn Tulun*, 242.

<sup>80</sup> Creswell, *Early Muslim Architecture*, 2:336-7.

<sup>81</sup> al-Maqrizi, *Khitat*, 2:268.

<sup>82</sup> Creswell, *Early Muslim Architecture*, 2:337.

<sup>83</sup> *Ibid.*, 338.

<sup>84</sup> Creswell, *Early Muslim Architecture*, 2:338.

<sup>85</sup> <http://www.gutenberg.org/files/17816/17816-h/17816-h.htm>

<sup>86</sup> Creswell, *Early Muslim Architecture*, 2:338.

<sup>87</sup> Swelim, *Mosque of Ibn Tulun*, 150.

<sup>88</sup> Abdul Wahab, *History of Ancient Mosques*, 46.

<sup>89</sup> Swelim, *Mosque of Ibn Tulun*, 164.

## Chapter 2

### Decorative Stucco

#### 2.1 Origins of Stucco Decoration

Stucco is a technique used to decorate plain surfaces of walls and ceilings on the exterior or interior of buildings. Stucco comes from the Italian word *stucchi* “to describe the decorative plaster work executed in stucco”.<sup>90</sup> It is a lime-based substance that sets slowly, so it can be moulded or sculptured and gets hard when it dries. Stucco is well known for its economical virtue being a cheap material; Mehmet Aga-Oglu agrees that stucco was used because it was a “cheap and soft material to work with”.<sup>91</sup> He also notes that stucco was used in architecture in Mesopotamia and Iran from pre-Islamic times and it continued throughout the Middle Ages in the Near East as an artistic style;<sup>92</sup> it was also used as a protective layer on mud-bricks.<sup>93</sup> Stucco was introduced in Mesopotamia in the middle of the first century CE<sup>94</sup>, since then it was abundantly used throughout Mesopotamia during the Parthian dynasty (247BCE-224CE) and the Sasanian dynasty (224-65CE).<sup>95</sup> Debevoise suggests that stucco first appeared during the Parthian period.<sup>96</sup> Most of the patterns which were commonly used in the Near East were of a Greco-Roman origin.<sup>97</sup>

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<sup>90</sup> Gapper, “What is Stucco”, 333.

<sup>91</sup> Aga-Oglu, “Remarks”, 184.

<sup>92</sup> Ibid., 184-5.

<sup>93</sup> Talgam, *Stylistic Origins*, 53.

<sup>94</sup> Debevoise, “Origin of Decorative Stucco”, 45.

<sup>95</sup> Stucco decoration. (2005). In Encyclopaedia Iranica: <http://www.iranica.com/articles/stucco-decoration-in-iranian-architecture>

<sup>96</sup> Debevoise, “Origin of Decorative Stucco”, 45.

<sup>97</sup> Ibid., 49-50.

Unfortunately, due to the destruction of Ibn Tulun's city, most of the stucco designs of his were destroyed, however, remains were found in the litter accumulation of Fustat<sup>98</sup> that suggest that the city probably resembled the city of Samarra with houses mostly decorated in stucco. The only stucco that survived was that of the Ibn Tulun mosque and some fragments from houses near the mosque, apart from the remains of a small Tulunid *hammam* that was discovered in 1932 in the area between al-Fustat and al-Qata'i' that was decorated with stucco.<sup>99</sup>

The stucco of the soffits of the arches is quite unique in Egypt. The soffits were carved with intricate abstract floral designs very similar to the Samarra stucco, but which also possibly show Roman and Byzantine influence as well.

The Umayyad dynasty created lavish stucco decorations that were very visible in Khirbat al-Mafjar and Qasr al-Hayr West. Some scholars trace these works to Persia or Iraq, while Hamilton thinks that the craftsmen were native Palestinians or Syrians working under the supervision of an immigrant master from Iran.<sup>100</sup> Umayyad stucco developed from the Eastern Mediterranean tradition.<sup>101</sup> It is a combination of Byzantine and Sasanian styles.<sup>102</sup> Talgam mentioned three ways how stylistic influences could have passed from Byzantine art to Umayyad art: first, constant contact with Byzantine structures, second, spoliation from Byzantine and Roman structures and third, employing local craftsmen and artists.<sup>103</sup> Rosen-Ayalon thinks that Umayyad art was mainly an Iranian-Sasanian influence with a minor Byzantine influence.<sup>104</sup> Hoffman's opinion is that Umayyad art is a synthesis of elements

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<sup>98</sup> Creswell, "Newly Discovered Tulunide Ornament", 180.

<sup>99</sup> Ibrahim, "Tulunid Hammam", 35.

<sup>100</sup> Hamilton, "Carved Plaster", 157.

<sup>101</sup> Building style. In ArchNet:

[http://archnet.org/library/images/sites.jsp?select=style&key=Abbasid&order\\_by=site\\_name&collection\\_id=-1&showdescription=1](http://archnet.org/library/images/sites.jsp?select=style&key=Abbasid&order_by=site_name&collection_id=-1&showdescription=1)

<sup>102</sup> Talgam, *Stylistic Origins*, 40.

<sup>103</sup> Ibid., 76.

<sup>104</sup> Rosen-Ayalon, "Considerations Umayyad Art", 95.



derived from the classical western Greco-Roman and the Eastern oriental traditions while keeping their local Mediterranean origin due to the dynasty's location in Damascus.<sup>105</sup> The Umayyad art patrons were evidently happy to combine different styles from different cultures.<sup>106</sup> There was always continuity and transition of art; "Umayyad style did not come to an end with the rise of the Abbasid dynasty. It kept its slow course of evolution until Samarra was founded."<sup>107</sup>

The Abbasid dynasty adopted most of their decorative arts from the Sasanian Empire since their capital city Baghdad was near Ctesiphon the ancient capital of the Sasanian Empire.<sup>108</sup> "Sasanian stucco decorations...confirm the long existence of the oriental Mediterranean ornament system before its adoption by Islam."<sup>109</sup> The decorations of brick and carved stucco are an Eastern tradition used by the Sasanian Empire that later on influenced and spread out all over the Islamic world. Hoffman thinks that while Abbasid art was influenced by the Sasanian-Persian tradition it also mirrored its local Mesopotamian origin due to the dynasty's location in Baghdad, the result being the new beveled style of stucco.<sup>110</sup> According to Shafii Samarra was affected by the local arts of Iraq and Persia mixed with Hellenistic traditions that formed Parthian art which in turn produced Sasanian art.<sup>111</sup>

Talgam mentions three commonly used Sassanian techniques of stucco decoration: the first is casting in mould plaques that were round, square or rectangular. The second was carving directly on the walls, a technique that was maintained during the Abbasid dynasty.

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<sup>105</sup> Hoffman, "East and West": 107.

<sup>106</sup> Talgam, *Stylistic Origins*, 46.

<sup>107</sup> Shafii, *Simple Calyx Ornament*, 8.

<sup>108</sup> Building style. In ArchNet:

[http://archnet.org/library/images/sites.jsp?select=style&key=Abbasid&order\\_by=site\\_name&collection\\_id=-1&showdescription=1](http://archnet.org/library/images/sites.jsp?select=style&key=Abbasid&order_by=site_name&collection_id=-1&showdescription=1)

<sup>109</sup> Diez, "Simultaneity": 187.

<sup>110</sup> Hoffman, "East and West": 107-8.

<sup>111</sup> Shafii, *Simple Calyx Ornament*, 9.

The third technique is called the applied, where the carving was done beforehand in sections before attaching it to the wall.<sup>112</sup> The most elaborate Abbasid stucco can be seen at Samarra; this stucco is distinguished by its repetitive symmetrical abstract floral and geometric designs.<sup>113</sup>

## 2.2 Analysis of Samarra Stucco

Samarra stucco was analyzed by Herzfeld and Creswell differently. Herzfeld categorized its stucco into three styles: first, second and third. Creswell rearranged these styles in what he thought was a chronological sequence; he classified the vine leaf being chronologically the earliest. He categorized Herzfeld's third style as A, the second style as B and the first style as C. Herzfeld's classification were also categorized according to the influence of craftsmen by district,<sup>114</sup> he classified the first style as Coptic, the second as Iraqi and the third as North Mesopotamian.<sup>115</sup> Herzfeld published his first volume *Der Wandschmuck der Bauten von Samarra und seine Ornamentik* in 1923 of his Samarra excavations, the book "is a typological study of ornamentation recovered, categorized by motif, and not by material."<sup>116</sup> It was a comprehensive detailed book defining Samarra motifs and style.<sup>117</sup>

Style A (Fig. 2.1) is a naturalistic vine leaf ornament; Herzfeld pointed out that these vine leaves are a cross between Mesopotamian and Sasanian.<sup>118</sup> However they are different in that the leaf is separate from the vine, the leaf is five-lobed and the vine is three-lobed.<sup>119</sup>

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<sup>112</sup> Talgam, *Stylistic Origins*, 53-4.

<sup>113</sup> Behrens-Abouseif, *Islamic Architecture*, 57.

<sup>114</sup> Creswell, *Early Muslim Architecture*, 2:286.

<sup>115</sup> Herzfeld, *Ausgrabungen von Samarra*, 21.

<sup>116</sup> Alastair, "Creswell, Herzfeld, and Samarra", 83.

<sup>117</sup> Haase, "The Development of Stucco", 439.

<sup>118</sup> Herzfeld, *Der Wandschmuck*, 7.

<sup>119</sup> Herzfeld, *Ausgrabungen von Samarra*, 19.

He considered it the birth of the arabesque in Islamic art.<sup>120</sup> He thought that the third style (style A) has some common factors with the second style (style B) since both are done freehand, with unlimited variations and deep carving.<sup>121</sup> According to Shafii many of its features showed Hellenistic influence; he gave some examples of these influences such as the indentions, the palmette, the parallel veining and the eye design,<sup>122</sup> “also the technique of carving which was done in different planes in modeled relief.”<sup>123</sup> Ettinghausen pointed out that the designs were done within long bands, frames, polygons and rectangles.<sup>124</sup> But Flury thought that this style showed a North Mesopotamian influence.<sup>125</sup> The design was deeply cut into the gypsum;<sup>126</sup> made off site,<sup>127</sup> then prepared on special mats for transportation. It has been argued that style A underwent several changes and simplifications resulting in a new style which was classified as style B.<sup>128</sup> Hameed chose the vine leaf to show the changes it underwent from style A to style B; figs. 2.2a and 2.2b are examples of early style A, five-lobed rounded vine leaves; it changed gradually into an abstract leaf; on the vine leaf in fig. 2.2c the lobes vanish completely, it contains five separate leaves indicating the direction of the lobes that were omitted.<sup>129</sup> The leaf in fig. 2.2d developed into a plain abstract one, having a circular contour and decorated with punctuations. According to Creswell minor changes were apparent, for example the vine leaves continued to be five-lobed or three-lobed but had punctuations (he calls them bold eyes) between each lobe and

<sup>120</sup> Haase, “The Development of Stucco”, 440.

<sup>121</sup> Herzfeld, *Ausgrabungen von Samarra*, 18-9.

<sup>122</sup> Shafii, *Simple Calyx Ornament*, 216.

<sup>123</sup> *Ibid.*, 216.

<sup>124</sup> Ettinghausen, *Art and Architecture*, 102.

<sup>125</sup> Flury, “Samarra und die Ornamentik”, 422.

<sup>126</sup> Creswell, *Early Muslim Architecture*, 2:286.

<sup>127</sup> Ettinghausen, *Islamic Art*, 57.

<sup>128</sup> Hameed, “Some Aspects”, 69.

<sup>129</sup> *Ibid.*, 71.

concentric ridges around them; the density of the background filling increased and the former three grapes that were superimposed on the junction of its leaf no longer appeared.<sup>130</sup>

Style B (fig. 2.3) is characterized as an abstract vegetal ornament arranged symmetrically inside geometric frames; the design fills all the space; background spaces decreased giving more space for the motifs,<sup>131</sup> without repetition;<sup>132</sup> “the contours of each element were made to fit exactly those of the adjoining elements,”<sup>133</sup> producing some unique designs.<sup>134</sup> Small dots and notches cover each leaf and flower,<sup>135</sup> it is “characterized by crosshatched lobes”.<sup>136</sup> Herzfeld thought that the vegetal motifs were variations on Sasanian palmettes.<sup>137</sup> Flury thought that this style was an Iraqi influence.<sup>138</sup> It was done in deep carving using freehand style,<sup>139</sup> all the spaces were filled but not densely.<sup>140</sup> Shafii thought that styles A and B were of Hellenistic, Byzantine and Sasanian origins.<sup>141</sup> According to Herzfeld the second (style B) and the third (style A) style were carved using the freehand style before fixing the plates to the wall and sometimes the carvings were done directly on the wall.<sup>142</sup> According to Creswell style B does not have stalks; it is anti-naturalistic,<sup>143</sup> “the principal stems became so short that they almost disappeared, the motifs growing from one another.”<sup>144</sup> Style B evolved to become more economic than style A; style A had to be carefully carved to produce such minute details on different planes on a small scale while

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<sup>130</sup> Creswell, *Short Account*, 374.

<sup>131</sup> Shafii, *Simple Calyx Ornament*, 217.

<sup>132</sup> Herzfeld, *Der Wandschmuck*, 7.

<sup>133</sup> Shafii, *Simple Calyx Ornament*, 10.

<sup>134</sup> *Ibid.*, 217.

<sup>135</sup> Decoration. (2009). In *Encyclopedia of Islamic Art and Architecture*, 1:194.

<sup>136</sup> Northedge, “Ernst Herzfeld”, 395.

<sup>137</sup> Herzfeld, *Der Wandschmuck*, 7.

<sup>138</sup> Flury, “Samarra und die Ornamentik”, 422.

<sup>139</sup> Herzfeld, *Der Wandschmuck*, 7.

<sup>140</sup> Herzfeld, *Ausgrabungen von Samarra*, 17.

<sup>141</sup> Flury, “Samarra und die Ornamentik”, 218.

<sup>142</sup> Herzfeld, *Ausgrabungen von Samarra*, 17.

<sup>143</sup> Creswell, *Short Account*, 374.

<sup>144</sup> Shafii, *Simple Calyx Ornament*, 217.

style B was carved on plain and flat background with less careful details on a larger scale,<sup>145</sup> details were simplified.

Style C, also called the bevelled style (fig. 2.4) is a very abstract ornament that combines vegetal and geometric patterns occupying the whole surface, symmetrical on a vertical axis;<sup>146</sup> it is carved at an angle forming a slant or oblique cutting and has curved edges.<sup>147</sup> This technique of carving “never produces cast shadows but only shade.”<sup>148</sup> It surpassed “the previous Hellenistic-inspired designs.”<sup>149</sup> Background space was eliminated, single lines separated each motif, and motifs were repeated,<sup>150</sup> fulfilling the “*horror vacui*”.<sup>151</sup> Herzfeld described it as having an infinitely repetitive pattern,<sup>152</sup> Ettinghausen called it the tile method.<sup>153</sup> The whole surface was covered with abstract motifs making it difficult to distinguish the background from the design.<sup>154</sup> Creswell thought that this design was influenced by Hellenistic and Greek art.<sup>155</sup> Some of these abstract vegetal motifs were “leaves, blossoms, and twining tendrils...and include additional notches, slits, and pearl borders.”<sup>156</sup> The palmette pattern is the main feature of the design.<sup>157</sup> Herzfeld thought that the designs were influenced by border designs in Hellenistic architecture and mainly the acanthus motif.<sup>158</sup> Riegl thought that it was a late Roman influence.<sup>159</sup> Dimand described this style as having two patterns, a positive and a negative pattern; the positive motif seemed lighter; these designs were the palmettes, leaves, trefoils and the bottle-shaped designs; the

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<sup>145</sup> Shafii, *Simple Calyx Ornament*, 217.

<sup>146</sup> Ettinghausen, *Islamic Art*, 58.

<sup>147</sup> Ali, *Arab Contribution*, 61.

<sup>148</sup> Gonella, “Three Stucco Panels”, 88.

<sup>149</sup> O’Kane, *Islamic Art*, 19.

<sup>150</sup> Shafii, *Simple Calyx Ornament*, 218.

<sup>151</sup> Herzfeld, *Der Wandschmuck*, 10.

<sup>152</sup> Herzfeld, *Ausgrabungen von Samarra*, 16.

<sup>153</sup> Ettinghausen, “The Taming”, 17.

<sup>154</sup> *Ibid.*, 16.

<sup>155</sup> Creswell, *Early Muslim Architecture*, 2:288.

<sup>156</sup> Ali, *Arab Contribution*, 61.

<sup>157</sup> Hameed, “Origin And Characteristics”, 83.

<sup>158</sup> Herzfeld, *Der Wandschmuck*, 13.

<sup>159</sup> Hameed, “Origin And Characteristics”, 83.

negative pattern appeared darker due to the incised lines, dots and spirals.<sup>160</sup> According to Ettinghausen the main characteristics were “repetition, bevelling, abstract themes, total covering, and symmetry.”<sup>161</sup> Dimand thought that style C was a Central Asian influence, which was mainly initiated by Turkish or Iranian artists.<sup>162</sup> Flury thought that it showed Coptic influence.<sup>163</sup> Shafii thought that style C had a Hellenistic influence and it evolved into style A and B.<sup>164</sup> Styles B and C symbolize a new feature of ornamentation in Islam, liberated from the bonds of the former arts.<sup>165</sup> Northedge thought that it was a Samarran phenomenon that only occurred outside of Samarra in Tulunid Egypt.<sup>166</sup> El-Masry wrote that the rooms in Samarra were lavishly decorated with a repetition of motive similar to a tapestry.<sup>167</sup> According to Herzfeld patterns were repeated because molds were used, the patterns being cut out of wooden planks then filled with clay, then backing the clay forming a cast of stucco.<sup>168</sup> But recent studies done by Gonella show that the stucco was carved freehand because there was no trace of joints, and no single pattern was repeated precisely.<sup>169</sup> Most probably the craftsmen carved very fine grids to draw the patterns on it; traces of a grid system were discovered in Kharab Sayyar.<sup>170</sup>

Samarra stucco is considered an evolutionary art in Islamic decorative art. It adapted from Sasanian art then underwent several stages to reach the final new style. Shafii summarized Samarra characteristics that were influenced from pre-Islamic art in six points.

1. The notch at the base of the calyx and the winged leaves are influences from the winged patterns in Sasanian art.
2. The split calyx is a Hellenistic influence.
3. The winged leaf

<sup>160</sup> Dimand, “Samarra the Ephemeral”, 88.

<sup>161</sup> Ettinghausen, *Art and Architecture*, 104.

<sup>162</sup> Dimand, *Muhammadan Art*, 89.

<sup>163</sup> Flury, “Samarra und die Ornamentik”, 422.

<sup>164</sup> Shafii, *Simple Calyx Ornament*, 8.

<sup>165</sup> Shafii, “Zakharif Wa Turuz Samarra”, 1-2.

<sup>166</sup> Northedge, “Ernst Herzfeld”, 396.

<sup>167</sup> El-Masry, *Tulunidische Ornamentik*, 74-5.

<sup>168</sup> Herzfeld, *Der Wandschmuck*, 10.

<sup>169</sup> Gonella, “Three Stucco Panels”, 92.

<sup>170</sup> *Ibid.*, 92-3.

developed from the Sasanian winged pattern. 4. Crowding the patterns and leaving no background spaces by using molds is a Sasanian influence; however this point is inaccurate because recent studies done by Gonella proved otherwise. 5. The slant carving of the patterns close to each other was present before Samarra at Hira. 6. The floral motifs growing out of each other was found in Syrian Christian ornament.<sup>171</sup>

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<sup>171</sup> Shafii, *Simple Calyx Ornament*, 220.

## Chapter Three

### The Patterns of Ibn Tulun Mosque Stucco

The remaining stucco decorated soffits are located on the southwest and the northwest arcades. The southwest arches have eleven different stucco patterns, while the northwest arches have six patterns; these include the restored soffits; and a small part of stucco still present on an entrance arch. I will discuss only the original soffits referring especially to their pre-restoration state in Creswell's photos. Those stucco patterns were not found before this in Egypt.

#### 3.1 Roman and Byzantine Origin

The stucco decoration shows a strong influence of Byzantine and Roman art, as was suggested by many authors, but none had substantiated this. André Raymond mentions that the decorations "show the last traces of Byzantine influence."<sup>172</sup> Oleg Grabar thought that Byzantine art created Islamic art,<sup>173</sup> by using Byzantine elements.<sup>174</sup> He gave examples of the outstanding geometric and vegetal designs of the mosaics and stuccoes that "reflect the art of Antiquity,"<sup>175</sup> in the Dome of the Rock,<sup>176</sup> Khirbat al-Mafjar and Qasr al-Hayr.<sup>177</sup> According to Doris Behrens-Abouseif the floral designs are "Samarran floral fillings, no doubt belonging to Byzantine tradition."<sup>178</sup> She thinks that the geometric decoration of Ibn Tulun's mosque shows a strong influence of Byzantine tradition.<sup>179</sup> She also mentions that the Sasanian culture inspired the works of the Abbasids and that both the Byzantine and

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<sup>172</sup> Raymond, *Cairo*, 28.

<sup>173</sup> Grabar, "Islamic Art and Byzantium", 88.

<sup>174</sup> *Ibid.*, 73.

<sup>175</sup> *Ibid.*, 88.

<sup>176</sup> *Ibid.*, 73.

<sup>177</sup> *Ibid.*, 75.

<sup>178</sup> Behrens-Abouseif, *Islamic Architecture*, 56.

<sup>179</sup> *Ibid.*, 56.



Sasanian cultures led to the advancement of the evolution of the abstract and floral decorative patterns.<sup>180</sup> Stanley Lane-Poole mentions that the scrollwork can be traced to Byzantine art.<sup>181</sup> According to Ernst Diez, the geometric pattern of the stucco of Ibn Tulun shows both the influence of Roman mosaics during late antique times as well as Sasanian stucco.<sup>182</sup> Creswell thought that the three styles of Samarra were “combined and mixed”<sup>183</sup> when applied in Ibn Tulun, while in Samarra the three styles were present individually.<sup>184</sup>

### 3.2 Detailed Analysis of the Stucco Patterns

All the soffits had stucco decoration, unfortunately only a few survived. All the soffits are decorated with a double frame; a central band that varies in each soffit surrounded by two bands on each side of the central band. The two bands are of the same motif on all the soffits; they consist of squares with a small circle in the center,<sup>185</sup> or a band of square beads with holes in the center.

#### **Soffit 1 (third from southwest *riwaq*):**

The frame consists of a double band of squares with a small circle in the middle; the central band is of a continuous leaf pattern (fig. 3.1). Inside the frame the main design is interlacing bands forming eight-lobed compartments oval in shape containing abstract leaf design. In the center there is a strapwork medallion containing different vase forms and leaves either full-face or in profile. There are five different motifs a, b, c, d and e (fig. 3.2). Fig. 3.2a is a three-sepal calyx; the petal in the middle is a vase form containing a five-lobed vine leaf, a Roman influence, the vasiform leaf has very fine carved incisions. The leaf is connected at the bottom and the top to two

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<sup>180</sup> Behrens-Abouseif, *Islamic Architecture*, 57.

<sup>181</sup> Lane-Poole, *Art of the Saracens*, 90.

<sup>182</sup> Diez, “Simultaneity”, 187.

<sup>183</sup> Creswell, *Early Muslim Architecture*, 2:356.

<sup>184</sup> *Ibid.*, 356.

<sup>185</sup> El-Masry, *tulunidische Ornamentik*, 31.

thin punctuated outer half-palmette leaves. Fig. 3.2b is a three sepal calyx; the petal in the middle is a vase form containing a five-lobed vine leaf that is thinner than the previous one. The vasiform leaf is connected at the bottom and the top to two outer half-palmette leaves that have three incisions. Fig. 3.2c is a three-sepal calyx; the petal in the middle is a vase form containing a five-lobed vine leaf, the vasiform leaf is smooth. The vasiform leaf is connected at the bottom and the top to two outer half-palmette leaves that have three incisions, shorter than the previous one. Fig. 3.2d is a three-sepal calyx; the petal in the middle is a vase form containing a seven-lobed palmette, the vasiform leaf is smooth. The vasiform leaf is connected at the bottom and the top to two outer punctuated half-palmette leaves that have two short incisions. Fig. 3.2e is a three-sepal calyx; the petal in the middle is a vase form containing a drop shape, the vasiform leaf is connected at the bottom and the top to two outer abstract leaves, influenced from the Sasanian winged pattern. The eight-lobed oval compartments contain abstract leaves that are of three types (fig. 3.3); all the leaves are divided into two halves that are different. In the first type (figures 1 to 9) each leaf is divided into two halves facing each other, some are plain, others have incisions or punctuations. In the second type (figures 10 to 18) each leaf is divided into two halves with one facing outwards, one of the halves is divided into two forks. In the third type (19 to 30) each leaf is divided into two halves, one facing outwards, one of the halves is divided into three forks. In figures 1 to 8, 11 to 13 and 18 and 19 one half of the leaves is a trumpet form forming a half palmette.

### **Soffit 2 (fourth from southwest *riwaq*):**

The frame consists of a double band of squares with a circle in the center; the central band is a zigzag line forming triangles (fig. 3.4). Inside the frame the main design in the middle is a band forming a Byzantine cross with pointed edges, each edge forms a rhombus thus creating a central eight-pointed star design. Every four crosses form rhombuses, stars and squares. The stars contain vegetal motifs with eight petals; some spring from a rosette. All the filling patterns are variations of the same pattern.<sup>186</sup> El-Masry categorized these ornaments into four varieties<sup>187</sup> (fig. 3.5). Variant 1 follows the geometric form of the star; from the center the leaves are rhombus-like having small overlaps. Variant 2 is a vegetal design; springing from a rosette in which eight leaves overlap three times. Variant 3 has the same rosette as in variant 2 but the structure of the leaves is different; these leaves swing out and have punctuations. Variant 4 is similar to variant 2; but the leaves springing out of the rosette overlap. The artist does not follow any identical pattern; he uses a freehand style.<sup>188</sup> On the left and the right of the main design there are half stars that have the same design as the stars at the center. The squares on each side contain floral forms with four variations<sup>189</sup> (fig. 3.6). These floral forms are similar to those in the octagons in Soffit 1 (first from the east at the northwest side) (fig. 3.42). Variant A: a three-sepal calyx with a cleft base; the middle leaf is narrower on the bottom and wider on the top and divided into three forks with a bend. Variant B: the middle leaf is the same as variant A, the outer leaves are not bend; there are three further variants to this motif: 1. The outer leaf is open and has fine line incisions, Herzfeld calls it a

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<sup>186</sup> Herzfeld, "Die Genesis", 40.

<sup>187</sup> El-Masry, *tulunidische Ornamentik*, 33.

<sup>188</sup> *Ibid.*, 33.

<sup>189</sup> *Ibid.*, 33.

trumpet form forming a half-palmette.<sup>190</sup> 2. The outer leaf has two lines in the middle.

3. The outer leaf is punctuated with dots. Variant C: a three-sepal calyx with a notched base, the middle leaf is vasiform, the outer leaves are bent twice, facing outwards. Variant D: the middle leaf is the same as variant C, the outer leaves are bent, facing inwards and attached at the base. The small rhombs between the squares (fig. 3.7) contain a three-petal leaf.

### **Soffit 3 (fifth from the southwest *riwaq*):**

The frame consists of a double band of squares with a small circle in the center; the band between them is a zigzag forming triangles; in each triangle there is a bifurcated leaf (fig. 3.8). Comparing the post-restoration photo and Creswell's photo, one of the rosettes is missing and another one has been restored incorrectly. Inside the frame the main design is interlacing circles; each circle is intersected by four other circles forming segments containing different leaf motifs. In the center of each large circle there is a small circle containing floral motifs; similar to soffit 7 (fig. 3.25); each small circle is surrounded by semi-circles forming a four-lobed rosette. There is a square between each circle containing four squared beads with punctuations in the center. The oval segmental forms contain abstract leaves of five types (fig. 3.9). The first type (1 and 2 in fig. 3.9) is an abstract vasiform leaf. The second type (3 to 7 in fig. 3.9) is a leaf divided into two halves facing each other, one is a half palmette with fine incisions; the other half is narrow at the bottom gets wider at the top then divides into three forks. The third type (8 and 9 in fig. 3.9) is a leaf divided into two halves facing each other, one half is a closed leaf; the other half is narrow at the bottom and gets wider at the top and then is divided into three forks. The fourth type (10 in fig. 3.9) is a leaf divided into two halves facing each other, one half is a closed leaf, the other is a half palmette. The fifth type (11 in fig. 3.9) is of a narrow leaf with

<sup>190</sup> Herzfeld, "Die Genesis", 40.

a three-forked end, its base is connected to two lanciform leaves, on the top is a segmented drop. The patterns inside these oval segments are various inventions of abstract leaves to fill the spaces some of the leaves are squeezed inside the oval. The main motif is a circle surrounded by semi-circles forming a four-lobed rosette (fig. 3.10). Circle (a) contains a three-lobed leaf having a longitudinal slit; the semi-circle contains abstract leaves; the spaces between the semi-circles and the oval segmental forms contain different abstract leaves. Circle (b) contains a two-sepal calyx having a drop shape in the center; the semi-circles contain abstract leaves. In circle (c) the motifs in the circle and the semi-circles are the same as in (a); the spaces between the semi-circles and the oval segmental forms contain different abstract leaves. Circle (d) contains a two-sepal calyx having a drop shape in the center; on each side of it is a half palmette; the semi-circles contain leaves that are divided into two halves, the palmette facing outwards and the closed leaf facing inwards. The spaces between the semi-circles and the oval segmental forms contain three different types of leaves: the first type has three leaves; the middle leaf has fine incisions and the other two are bifurcated leaves. The second type has three leaves; the middle leaf is a two-sepal calyx with a drop in the center and punctuations; the two outer leaves are heart-shaped with small incisions. The third type has two leaves that are divided into three forks at the top. The pattern is asymmetrical, each circle contains different patterns that are not repeated in other circles.

**Soffit 4 (sixth from the southwest *riwaq*):**

The frame consists of a double band of squares with a dot in the center; the central band is a herringbone pattern (fig. 3.11). The main design inside the frame is one of elongated hexagons containing the main motif of small squares and small triangles, it is not symmetrical around a vertical axis, the whole pattern has no

symmetry.<sup>191</sup> Each elongated hexagon contains a different abstract floral design that can be categorized into three types (figs. 3.12-14): The first type (a to j in fig. 3.12) is a floral motif having three parts, its lower part having two closed leaves and a stem in the middle, the middle part having two leaves facing each other. There are two types for the upper part, a three-petal flower (a to g in fig. 3.12) or a closed bud (h to j in fig. 3.12). The second type (a to e in fig. 3.13) is a two-part floral motif, the lower part is vasiform (a to d in fig. 3.13) the upper part is two closed leaves. In fig. 3.13 (e) the lower and upper parts are both vasiform. The third type (a, b in fig. 3.14) has two similar paisley-like forms with a three-forked leaf at the top. Usually, this pattern is not symmetrical around a vertical axis, even though it has a geometrical underpinning. The small square fields have two patterns (fig. 3.15); one has a filling of four beads with a point in the center, the other has a four-petal flower; four small triangles are attached to every square containing a tiny three-petal flower (fig. 3.16).

**Soffit 5 (seventh from the southwest *riwaq*):**

The frame consists of a double band of squares with a small circle in the center; the central band is of a continuous leaf pattern. Each leaf has two tips and a curved rib; they alternate to the right and left (fig. 3.17). Inside the frame the main design is interlacing bands forming six-lobed compartments containing different calyx and floral patterns; the six-lobed compartments are divided into three forming three small compartments containing a three-leafed flower. There are six different calyx patterns (fig. 3.18): pattern (a) is a three-sepal calyx with a notched vasiform base containing a palmette (fig. 3.19 illustrates the different calyxes and the kinds of bases)

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<sup>191</sup> <http://sonic.net/~tallen/palmtree/symmetries/appendix.f.symm.htm>

the notched base is a Sassanian influence<sup>192</sup>; its top outer leaves are bent inwards closing over the middle leaf; the bottom outer leaves are three-forked, one of the inner forks ends in a bent leaf form. Pattern (b) is a three-sepal calyx with a curved base forming a funnel<sup>193</sup> Shafii calls it the mono base<sup>194</sup> (see fig. 3.19) containing a smaller version of a three-sepal calyx; its two outer half leaves are facing inwards; the top of the calyx is similar to (a); the bottom has two outer leaves; the narrow inner leaves are bent inwards. The outer leaves are three forked; the inner fork ends in a large leaf form bent over the other two forks. Pattern (c) is a three-sepal calyx with a curved base forming a funnel containing a small three-forked leaf; the top of the calyx is similar to (a) but smaller; the bottom outer leaves are split, ending in three forks, the inner fork ending in a large leaf bent outwards. Pattern (d) is a three-sepal calyx with a notched vasiform base (common in Samarra style B<sup>195</sup>) containing a palmette; the top of the calyx is similar to (a) but smaller; the bottom outer leaves are three-forked; the inner fork ends in an open leaf form facing outwards. Pattern (e) is a three-sepal calyx narrow at the bottom and wider at the top; the bottom outer leaves are a half palmette ending in a bent inwards leaf. Pattern (f) is a three-sepal calyx whose top outer leaves are bent twice; the inside of the vasiform base is a three-sepal calyx whose outer leaves are large facing inwards; the bottom outer leaves have a three-forked ending. There are six different floral patterns (fig. 3.20): pattern (a) is a six-leafed flower. Each leaf is heart-shaped containing a three-leafed leaf surrounded by fine lined incisions; between each heart-shaped leaf is an elongated leaf ending in three parts. The pattern does not fit evenly into the space, being squeezed on the left

<sup>192</sup> Shafii, *Simple Calyx Ornament*, 220.

<sup>193</sup> *Ibid.*, 43.

<sup>194</sup> Shafii's explanation of the mono base: "It is usually formed by one curved line, and in few cases by two curves forming a funnel. This funnel-shape developed in an element from Fustat into a straight-sided cone exactly fitting the mouth of a lower calyx, and its mouth in turn is filled with the base of another one." (p. 43)

<sup>195</sup> Shafii, *Simple Calyx Ornament*, 43.

side. Pattern (b) is a six-leafed flower with each leaf containing a smaller trefoil leaf surrounded by fine lined incisions. Between each main leaf is a three-forked leaf; the center contains a small six-petal flower. Pattern (c) is a radiating six-leafed flower, ending in a three-forked tip; the center contains four small circles with a small point in the center. Pattern (d) has three heart-shaped leaves like those of pattern (b) attached to it. At the base are two leaves on each side whose ends are trifurcated; between each of the previous leaves is a leaf that ends in a three-leafed tip; the center contains a six-petal flower. Pattern (e) is a six-leafed flower where each leaf is heart-shaped and divided by a fine lined arrow-like incision and punctuations. Between each leaf is a three-forked leaf containing a drop shape; the center has a punctuated circle; the left side of the pattern is squeezed. Pattern (f) is a six-leafed flower where each leaf is heart-shaped and punctuated; between each leaf is a three-forked leaf with an arrow incision in the middle; the pattern does not fit evenly into the space because the right side is squeezed this proves that it was done by freehand without incising the pattern beforehand. The divided six-lobed compartments (fig. 3.21) contain three different types of flower fillings: in (a) the first type is three punctuated circles forming a flower, the second type is a three-leafed flower with a punctuation in the center; in (b) the third type is a vasiform having two bent leaves curling back on the top of the vase. The pattern inside the framework is not symmetrical around a vertical axis; the six-lobed compartments adjacent to each are not complete, only four-lobes are visible because they are squeezed into the frame making it look asymmetrical; this is not a common feature in the rest of the soffits.

**Soffit 6 (eighth from the southwest *riwaq*):**

The frame consists of a double band of squares with a small circle in the center; the central band is a continuous leaf tendril; each leaf has punctuations



(fig. 3.22). Inside the frame the main design is of large interlacing hexagons that have a smaller hexagon in the center containing the main ornament; the interlacing hexagons form triangles and rhombuses. There are six different types of ornaments inside the hexagons (fig. 3.23). Type (a) is vasiform containing a drop shape, its top has an inverted three-leafed motif, attached to the vasiform from top to bottom is an abstract leaf, another leaf is attached at the middle and has three ends. Type (b) is a three-sepal calyx with a cleft base; attached to its base on both sides of the vasiform body is a large notched leaf having two fine incised parallel lines at the base. The top is three-forked, the outer fork is longer, punctuated and bent inwards. A C-shaped punctuated leaf surrounds the outer fork; its base is punctuated, its top divided into three forks. The lower parts of the two three-forked leaves are look like what El-Masry calls a fish bubble,<sup>196</sup> forms that are similar to the Chinese symbol of yin and yang, similar to style B of Samarra and to the soffit of the outer arcade (figs. 3.47-49). Type (c) is a three-sepal calyx with a cleft vasiform base; attached to the right side of the base is a large S-shaped leaf, ending in a half leaf bending inwards. The pattern is asymmetrical due to lack of space. Type (d) is a leaf shape similar to a closed bud; attached to it on both sides is a leaf with fork-like endings. The endings at the edges are long and bent, one is bent outward the other inward. Type (e) is a three-sepal calyx with a cleft base; attached to it on both sides is a leaf with fork-like ends, one of which ends in a large leaf-shape bending inwards, the other forks outwards. Type (f) is a three-sepal calyx with a cleft base; the upper outer leaves of the vasiform body are bent inwards; attached to the body on both sides is a leaf whose top has a three-forked end. The outer fork on the left is longer and bent inwards; on the right the inner fork is longer and bent outwards; a C-formed leaf surrounds the outer forks; its

<sup>196</sup> El-Masry, *tulunidische Ornamentik*, 35.

base has a fine lined incision, its top is divided into three forks. The lower parts of the two three-forked leaves, similar to type (b), are interlocking. The triangles and rhombus compartments contain different vegetal ornaments. There are six different vegetal forms inside the triangular compartments (fig. 3.24). Triangle (1) contains a three-forked leaf with punctuations. Triangle (2) contains three leaves attached to each other. Triangle (3) contains three attached leaves, the leaf in the middle being elongated with a fine line incision. Triangle (4) contains three attached leaves, the leaf in the middle being similar to the one in triangle (3) but a little wider; its outer left leaf is bent inwards. Triangle (5) contains two attached leaves; one is a half leaf facing inwards, the other leaf is three-forked facing outwards. Triangle (6) contains a three-leafed punctuated flower.

The rhombus compartments contain three different types of leaves (fig. 3.25). The first type, (a), has two leaves with a three-forked end attached to each other at the base. The second type: (b), (c), (d) and (e); one of the leaves is large with a three-forked end; (b) has a drop-shape, while (c), (d) and (e) have two fine parallel line incisions; the other leaf is half open trumpet form forming a half palmette with fine incisions. The third type (f), (g) and (h) seems crude; (f) has a thick leaf with a three-forked end; attached to it on the right is a full formed leaf while on the left side an unattached leaf that is narrow at the base and wider at the top; (g) has a thick leaf with a three-forked end attached to it, on the left is a half open leaf facing inwards, on the right is a thin worm-like leaf; (h) has a thick leaf with a three-forked end, the outer fork ends in a large bent leaf, a thinner leaf is attached at the bottom, patterns (f), (g) and (h) are crude; this proves that different craftsmen worked on the same soffit. Again exceptionally, the pattern inside the framework is not symmetrical around a vertical axis.

### **Soffit 7 (ninth from the southwest *riwaq*):**

The frame consists of a double band of squares with a small circle in the center; the central band is of a vegetal leaf pattern; they are not all regularly sorted, a leaf cluster may curve to the right the next to the left, then there may be three leaves curving to the right (fig. 3.26). Inside the frame the main design is of interlacing six-pointed stars formed by intersecting hexagons. The star is always positioned in the center. It is made up of six rhombuses, each end having a T-formed looped band forming a circle; each rhombus and circle contain vegetal motifs. The design is a double motif but not a mirror image, each corresponding compartment contains a different pattern.

The circles contain eight different patterns (fig. 3.27): pattern (a) is a three-sepal calyx with a cleft base, narrow at the bottom and wider at the top; the top outer leaves are large and bent inwards; the bottom outer leaves are half palmettes ending in a leaf bent inwards. A fine line divides the calyx; similar to pattern (e) in soffit 5 (fig. 3.18). Pattern (b) is a three-sepal calyx with a cleft base containing a trefoil; attached to its base is a long three-forked fan-like leaf similar to Sassanian winged leaves, its inner leaf bent outwards. Pattern (c) is a three-sepal calyx with a cleft base containing a trefoil; attached to its base is a three-forked leaf, the inner fork terminates in a large leaf bent outwards. Pattern (d) is a trefoil; the middle leaf is lanciform; the other two are kidney-shaped, attached to its base is a long three-forked leaf facing inwards. Pattern (e) is a three-sepal calyx, wide at the base and narrow at the top, containing a small circle and a fine line dividing it; its outer upper leaf is a long palmette facing inwards. Pattern (f) is a three-sepal calyx, wide at the base and narrow at the top, containing punctuations and a fine line dividing it; its outer upper leaf is a long palmette facing inwards. Pattern (g) is a three-sepal calyx with a cleft

base containing a palmette; attached to its base is a long three-forked leaf whose inner leaf is bent outwards. Pattern (h) is a leaf pattern containing a palmette, attached to its base a long leaf divided into three and its upper part divided into two.

The rhombuses contain vegetal patterns, similar to the patterns in the rhombuses on soffit 6 (fig. 3.25). There are seven different patterns (fig. 3.28). Pattern (a) has two leaves attached to each other, one three-forked, the other being a half leaf; both leaves have a small notch. Pattern (b) is similar to pattern (a) but has two fine parallel lines incisions. Pattern (c) is similar to pattern (b) but the half leaf contains a trefoil. Pattern (d) has two leaves attached to each other, one has a large three-forked end, the middle fork with some punctuations; the other is a half open leaf, the pattern is crude. Pattern (e) has two attached leaves, one with a three-forked end and two fine parallel lines incisions. The other is a half leaf with three-lobes and fine incisions on the edges. Pattern (f) has a thick leaf with a three-forked end whose outer fork ends in a large open bent leaf. Attached at the bottom is a thin leaf, similar to pattern (h) in soffit 6 (fig. 3.24). Pattern (g) has a stem with two leaves closing at the top to form a bud, and two smaller leaves are attached to the base of the stem.

#### **Soffit 8 (tenth from the southwest *riwaq*):**

The frame consists of a double band of squares with a small circle in the center; the central band is a continuous tendril of leaves, one leaf curving alternately right and left (fig. 3.29). Inside the frame the main design is interlacing bands forming circles that have six pointed segments (fig. 3.30); According to Herzfeld the interlacing bands are a Syrian influence that reached a high level of sophistication in Ibn Tulun;<sup>197</sup> he compares it to a similar carved stone pattern in Qasr al-Abyad (fig. 3.31). The center of each circle has a

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<sup>197</sup> Herzfeld, "die Mittelländer des Islam" 137.

six-pointed flower-like star (fig. 3.32), with a small circle in its center containing a six-leaved flower with a punctuation in each petal; all the fields are filled with a four-petal flower each having punctuations. There is another interlacing latticework forming triangles and rhombs (figs. 3.33-34).

**Soffit 9 (eleventh from southwest *riwaq*):**

The frame consists of a double band of squares with a small circle in the middle; the central band is a zigzag motif with small triangles having punctuations (fig. 3.35). The main design inside the frame is interlacing bands forming circles. Each four intersecting circles form a four-leafed shape having no decorative motifs in it (fig. 3.36). Every four intersecting circles are connected by a diamond shape that has a looped circle on each side (fig. 3.37); these contain a trefoil (fig. 3.38). The intersecting half circles touching the borders contain S-shaped leaves (fig. 3.39).

**Soffit 10 (twelfth from southwest *riwaq*):**

The frame consists of a double band of squares with a small circle in the middle; the central band is a zigzag motif with small triangles having drilled holes (fig. 3.40). Inside the frame the main design is squares surrounded by four circles at each corner, resulting in rounded edges, looking like a cross. The circles are made up of T-shaped looped bands with punctuations (fig. 3.41). The squares contain the main motifs (fig. 3.42). Motif (a) is a three-sepal calyx with a vasiform notched base decorated with punctuations. Attached to the base on each side is a three-forked leaf, the inner fork being the largest, ending in a large bent leaf with jagged edges covering the other two forks. Under the calyx is a two-leafed vegetal form whose upper part is divided into two lance-shaped tips. Motif (b) is a three-sepal calyx with a vasiform notched base decorated with punctuations. Attached to its base on each side is a three-forked leaf whose inner fork is the largest, ending

in a large bent half leaf. Motif (c) is a double motif like a mirror image but with an unequal proportion. It has a three-sepal calyx with a vasiform notched base decorated with punctuations. Attached to its base on each side a three-forked leaf whose inner fork ends in a half bent leaf. The circles contain different types of calyxes (fig. 3.43). Type (a) is a three-sepal calyx with a cleft vasiform base. Attached to its base is a leaf divided into two. Type (b) is a three-forked leaf; attached to its base are two half leaves decorated with punctuations.

### **Soffit 1 (first from the east at the northwest side):**

This soffit no longer exists (fig. 3.44). The frame consists of a double band of squares with a small circle in the middle; the central band is of two overlapping zigzags forming small rhomboids in between. Inside the frame the main design is of octagons and rhombs. Each four octagons form a rhomb in the center. The frame of the octagon is of a zigzag band.<sup>198</sup> All the octagons contain a similar vegetal motif (fig. 3.45). It has a three-leaved flower, the middle leaf being a trefoil. The rhombs contain smaller lozenges containing a trefoil (fig. 3.46). It is a double motif but it did not achieve a mirror image the patterns are slightly different.

### **Soffit of outer arcade of sanctuary (at the entrance, next to northeast wall)**

Only a small part of the decoration remained; the rest had been destroyed at the time of Creswell (fig. 3.47). The frame consisted of a single outer band of squares with a small circle in the center and a double band of the same design; the central band was of a continuous leaf pattern. Inside the frame the design was of a band forming a large square with smaller squares on each side of it. The band has the same pattern as that of the frame, squares with a small circle in the middle. The pattern inside the square is of a two-sepal

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<sup>198</sup> El-Masry, *tulunidische Ornamentik*, 32.

calyx; beneath it are looping stalks ending with four small three-leafed flowers. The spaces outside the squares have circles that El-Masry describes as fish bubbles.<sup>199</sup>

#### **Soffit of outer arcade of sanctuary (second arcade from northeast):**

The only remaining decoration is two fragments on each end of the soffit. The frame consists of a double band of squares with a small circle in the middle (fig. 3.48); the central band is wider than the usual example and consists of abstract elongated leaves that are decorated with small dots, heart-shaped leaves, vine leaves and wave-like stalks. Inside the frame the main design is of a star that contains an abstract floral pattern; each leaf has a different pattern. The upper leaf looks eye-shaped, on the left of it is a vine leaf, on the right is a leaf with a floral decoration in it. The leaf on the bottom is plain. The small squares contain drop-shaped patterns filled with small dots. Only a small fragment remains of the other showing part of a star that contains a fan-like shape (fig. 3.49). The square on the right side has a vase-shaped leaf with a trefoil tip. On the left side there is a “fish bubble” shape.

#### **Non-Extant Soffit decoration (from Owen Jones):**

This decoration is from *The Grammar of Ornament* (fig. 3.50); however drawings are not necessarily an accurate source to depend on for research because proportions and detail may differ. The central band is of a row of leaves motif that have punctuations. Inside the frame the main design is of beaded bands forming squares and triangles. The squares contain abstract leaf forms with punctuations. The triangles have hatched Samarra vine leaves; Samarra style A is combined with style B.<sup>200</sup>

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<sup>199</sup> El-Masry, *Tulunische Ornamentik*, 46.

<sup>200</sup> Creswell, *Early Muslim Architecture*, 2:345.

### **Non-Extant Soffit decoration (from Prisse d’Avennes):**

This decoration is from Prisse d’Avennes’ book *L’Art arabe* (fig. 3.51). The frame consists of a double band of squares with a small circle in the center; the central band is of a continuous leaf pattern. Inside the frame the main design is the same as the previous soffit, with beaded bands forming squares and triangles. The main pattern in the square is a three-leaved ornament; the triangles have elongated abstract leaves and vine leaves. His drawings should not be taken as evidence for missing details;<sup>201</sup> because details in his drawings are inconsistent, patterns are regularized to form total symmetry, proportions are altered and patterns are repeated identically.<sup>202</sup>

### **Analysis**

Islamic art is often considered ornamental and decorative, a means to cover plain areas.<sup>203</sup> It was thought that local artists created the geometric patterns on their own as a “tricks of trade without recourse to higher mathematics.”<sup>204</sup> By analyzing geometrical patterns it has been noted that the craftsmen had meticulous mathematical perception.<sup>205</sup> When carving stucco, the pattern must be drawn first by a compass and connected by straight lines, then it is carved.<sup>206</sup>

All the patterns can be analyzed in a mathematical way according to an algorithm concept, where “a pattern depends upon three characteristics a unit, repetition, and an organizing principle.”<sup>207</sup> Fundamentals of mathematics are used in making geometric patterns. For example by using circles and connecting the centers

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<sup>201</sup> O’Kane, “A Tale”, 318.

<sup>202</sup> Ibid., 317-8.

<sup>203</sup> Bier, *History of Mathematics*, 830.

<sup>204</sup> Ibid., 828.

<sup>205</sup> Ibid., 832.

<sup>206</sup> Ibid., 838.

<sup>207</sup> Ibid., 837.



with straight lines a triangular grid is formed and a symmetrical pattern is achieved. By connecting the centers in a triangular grid, a rhombic or a hexagonal grid is achieved.<sup>208</sup> Geometric patterns are easy to achieve by only using a pair of compasses and a ruler; without measuring the lengths of lines nor calculating the angles.<sup>209</sup>

In soffit 2 (fig. 3.4), the pattern is arranged on a grid of squares at an angle of  $45^\circ$ ;<sup>210</sup> (fig. 3.52) different geometric shapes: squares, stars and crosses are drawn on a square grid. The eight-pointed star is done in an elaborate way, that it could be seen as a star and a cross. In soffit 3 (fig. 3.8), the same grid of squares is used. As in the previous soffit (fig. 3.53) circles and semicircles are drawn on the grid. Geometrically it is a very simple design of intersecting circles; each four intersecting circles form a small square. In soffit 6 (fig. 3.22), the pattern is arranged on a grid of equilateral triangles<sup>211</sup> (fig. 3.54) and interlacing hexagons, triangles, rhombuses and parallelograms are drawn on the grid. The six pointed star consists of six diamonds. In soffit 7 (fig. 3.26), the pattern is arranged on a grid of equilateral triangles (fig. 3.55) and hexagons, rhombuses, six pointed stars and circles are drawn on the grid. In soffit 8 (fig. 3.29), the same grid of equilateral is used as the previous soffit (fig. 3.56) circles, rhombuses and triangles are drawn on the grid. The interlacing circles are achieved by drawing intersecting circles then connecting the lines of the intersections of the circles and the circles (fig. 3.57).

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<sup>208</sup> Bier, *History of Mathematics*, 837.

<sup>209</sup> Broug, *Geometric Design*, 22.

<sup>210</sup> Creswell, *Early Muslim Architecture*, 2:344.

<sup>211</sup> *Ibid.*, 344.

### 3.3 Analysis of window grills

The mosque has 128 windows grills that have very delicate lacework stucco, Creswell thinks that only three are original because they are “composed of compass work, i.e. circles and segments of circles.”<sup>212</sup> On the fifth window from the left on the south-east side (fig. 3.58) the stucco is densely ornamented with triangles, hexagons and circular six-lobed flower design. It can be geometrically analyzed by constructing a mesh of equilateral triangles to form hexagons (fig. 3.59) by using the method of concentric hexagons to provide us a center for the circles and their segments. Because the hexagons are not in a complete form, the six-lobed motif’s center is the corner of the inner hexagon. The outer circle’s center is the corner of the outer hexagon. Triangles are formed by joining three alternate centers which also provide us with the circle’s segments.<sup>213</sup> On the sixth window from the left on the south-east side (fig. 3.60) the motifs of the stucco are of hexagons, circles and lozenges. It can be geometrically analyzed using a mesh of equilateral triangles to form hexagons (fig. 3.61) then drawing a large circle from the corners of each hexagon “and in the centre of every alternate one a small circle tangential to the former.”<sup>214</sup> The diameter of the small circles are three times smaller than the larger circles.<sup>215</sup> The sixteenth window from the left on the south-east side (fig. 3.62) it is the most elaborate stucco window grill, ornamented with different sizes of circles and trefoil motifs. It is geometrically analyzed by constructing a mesh of equilateral triangles to form hexagons (fig. 3.63). At each hexagon’s center and corner a pair of small concentric circles is drawn, then another pair of circles are drawn from each

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<sup>212</sup> Creswell, *Early Muslim Architecture*, 2:347.

<sup>213</sup> *Ibid.*, 347.

<sup>214</sup> *Ibid.*, 347.

<sup>215</sup> *Ibid.*, 347.

center. Its outer circle “passes through all the corners of the inner hexagon.”<sup>216</sup> The larger circles are drawn from the outer hexagon’s corners.<sup>217</sup> “The lobes of the trefoils are struck from the rim of the circles at the corners of the outer hexagon”<sup>218</sup>

After analyzing all the patterns on the soffits it is obvious that there is not a single pattern repeated exactly, patterns are asymmetrical and no joints are visible, this proves that they were done freehand and no molds were used. In soffit 4 (fig. 3.11) the patterns are asymmetrical because it is easier than inventing countless symmetric forms of one pattern.<sup>219</sup> According to Herzfeld all of the mosque’s ornamentation was done freehand even without the incision of the design on the wet stucco prior to carving,<sup>220</sup> craftsmen carved the moist stucco with a tool<sup>221</sup> and it was “never cast in molds.”<sup>222</sup>

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<sup>216</sup> Creswell, *Early Muslim Architecture*, 2:347.

<sup>217</sup> *Ibid.*, 347.

<sup>218</sup> *Ibid.*, 347.

<sup>219</sup> Herzfeld, “Die Genesis”, 40.

<sup>220</sup> *Ibid.*, 40.

<sup>221</sup> Lane-Poole, *Art of Saracens*, 89-90.

<sup>222</sup> *Ibid.*, 90.

## Chapter Four

### Examples of Geometric Patterns Related to the Stucco of Ibn Tulun

Some previous scholars have attributed Ibn Tulun stucco patterns to Byzantine sources, others to Abbasid Samarra, however, up until now no comparative examples have been given for Byzantine influence. By searching for the closest parallels for the geometric designs used in Ibn Tulun mosque in Roman and Byzantine mosaics, the following examples will demonstrate earlier models. Geometric patterns were used in decorating Roman and Byzantine floor mosaics; circles, squares, rectangles, rhombs, octagons and stars. In Samarra floral motifs were used for decoration, surrounded by basic geometric figures. In Ibn Tulun geometric patterns were used mostly following Roman and Byzantine patterns combined with Samarran floral motifs filling the spaces inside the geometric patterns.

In mosaics a grid-pattern is used from simple geometric forms to complicated combinations, based on circles and octagons drawn in a repetitive manner forming the whole design,<sup>223</sup> meticulous calculation is essential for the design to fit the space of decoration.<sup>224</sup> A design had to be set out first, then a layer of mortar was spread on an even floor, then the artist filled the space with mosaics. Mosaics are also called tesserae, which are small pieces of pebbles of different shapes and colors. There were many techniques used in Greco-Roman mosaics, the most common techniques used: 1. Opus vermiculatum: A latin term meaning worms, small tesserae were used for fine details to achieve a painting like effect or outlining shapes; it was mostly used for decorating walls. Sometimes it was used for highlighting some details in floor

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<sup>223</sup> Dunbabin, *Mosaics of the Greek and Roman World*, 291.

<sup>224</sup> *Ibid.*, 282.

mosaics.<sup>225</sup> 2. Opus tessellatum (the more common technique): A Greek term meaning cube, these were larger stones or tesserae that were used,<sup>226</sup> mostly for floors. 3. Opus sectile: A Latin term meaning cut, it is used for decorating walls and floors using colored marble, stone or glass slabs “usually forming geometric vegetal, or figurative motifs.”<sup>227</sup>

#### 4.1 Roman Geometric Patterns

Roman floor mosaics were done in geometric and floral patterns; they usually had a frame that contained the main geometric design. The following mosaics contain patterns similar to those of Ibn Tulun’s soffits:

1. Poseidonia (Paestum) is a Greco-Roman city south of Naples; its floor mosaics date ca. 273 BCE. The pattern is of interlacing circles (fig. 4.1); when looking at a section, the pattern (fig. 4.2) is similar to soffit 3 (fig. 3.8).

2. Pompeii is an ancient Roman city near Naples; the floor mosaics date ca. 70-60 BCE. The mosaic in Fig. 4.3 is in the tablinum room 6; the outer pattern is of rhombs forming stars; the geometric arrangement (fig. 4.2) is also similar to soffit 2 (fig. 3.4).

3. The city of Clunia in the province of Burgos in Spain was founded in the first century CE. The pattern is composed of rhombs forming stars and squares also forming the Byzantine cross (fig. 4.4). The geometric arrangement (fig. 4.5) is similar to soffit 2 (fig. 3.4).

4. Vienne (Vienna) in the Roman North-Western provinces dates from the late second to early third century CE (fig. 4.6), the pattern is of large octagons with small

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<sup>225</sup> Pappalardo, *Mosaics*, 28.

<sup>226</sup> *Ibid.*, 27.

<sup>227</sup> *Ibid.*, 26.

lozenges between them; the pattern was done on a grid of octagons and diamonds. The geometric arrangement is similar to soffit 1 first from the east (fig. 3.43).

## 4.2 Byzantine Geometric Patterns

Byzantine floor mosaics evolved from Roman ones; the style was usually abstract and the images were usually without the shading that was sometimes employed on Roman mosaics. The following mosaics are similar to the patterns of Ibn Tulun's soffits:

1. The Basilica of San Vitale in Ravenna dates from 527-548 CE. The pattern is of intersecting circles (fig. 4.7). The geometric arrangement of the interlacing circles (fig. 4.9) is similar to soffit 3 (fig. 3.8).

2. The Bishop Marianus funerary chapel in Gerasa is dated 570 CE. The pattern is of continuous interlacing circles containing a square in the center (Fig. 4.8). The geometric arrangement of the interlacing circles (fig. 4.9) is again similar to soffit 3 (fig. 3.8).

3. Shunah in the territory of Livias in the east bank of Jordan dates from the sixth century CE. The pattern is of rhombs forming stars; it also forms a byzantine cross and squares, and between every two squares there is a lozenge containing a square (fig. 4.10). The geometric arrangement (fig. 4.11) is similar to soffit 2 (fig. 3.4).

4. Shiloh is located in the Ephraim hills and is datable ca. 600 CE. The pattern of the first floor mosaic (fig. 4.12) is within a frame and displays interlacing circles; the geometric arrangement is similar to soffit 3 (fig. 3.8, 4.2).

5. The Dome of the Rock in Jerusalem was completed in 691 CE. The mosaics of the spandrels depict floral designs. The spandrel in fig. 4.13 is of a stylized three-

sepal calyx surrounded by spear-like leaves and half palmette leaves. The outer leaves are similar to the ones in soffit 7 (fig. 3.26b) and the half-palmette is similar to soffit 7 (3.26e). The spandrel in fig. 4.14a-b is of a vase with four outer leaves that are bent at the top; two small leaves and two long ones. The vase form is similar to the vasiform in soffits 5 (fig. 3.18b-c), soffit 6 (fig. 3.22a-b, e-f) and soffit 10 (fig. 3.41a-b).

### 4.3 Samarra Geometric Patterns

Samarra stucco patterns had a geometric frame that contained classical or abstract motifs; the three styles of Samarra that were mentioned in chapter two. The following Samarra stuccos are similar to the patterns of Ibn Tulun's soffits:

1. Stucco decorative panel in the Islamic Museum in Cairo (fig. 4.15). It is Samarra style A, a combination of geometric and vegetal design. The design is of a bead band (pearl border) forming a hexagon; inside the hexagon there is a central five-lobed vine leaf surrounded by eight leaves, four three-lobed leaves and four five-lobed vine leaves. The pearl border is present in all the soffits; the five-lobed vine leaves are similar to the soffits of the outer arcade (figs. 3.48) and the drawings of Jones and Prisse d'Avennes (figs. 3.49, 3.50).

2. Stucco of a wall revetment (fig. 4.16). It is Samarra style A; the design is of a square, a circle, a large rectangle and a small rectangle having a pearl border. The square contains a vase having three five-leafed vine leaves and one three-petalled leaf. The circle contains a central five-leafed vine leaf surrounded by four-leafed forms and four calyxes. What remains of the large rectangle are two rounded five-lobed vine leaves and one elongated five-lobed leaf with a hazelnut-like shape. The small rectangle contains two five-lobed vine leaves. The three-lobed leaf is similar to those in soffit 3

(fig. 3.3); the elongated five-lobed leaf is similar to soffits 5 (fig. 3.5), 7 (fig. 3.7) and 9 (fig. 3.9).

3. Stucco panel from Samarra (fig. 4.17). It is Samarra style A; the design is of octagons and squares with a bead border. One of the octagons contains three five-lobed vine leaves, two three-lobed leaves and three different types of leaves. The other octagon contains a mirror image of abstract leaves, similar to those on soffit 6 (fig. 3.21). Each small square contains a different type of leaf: five-lobed vine leaves and three-lobed leaves. This panel was done on a grid of octagons and diamonds; it is made of a pattern of repeated identical shapes that fit together; this method is called tessellation.

4. Stucco panel from a private house (fig. 4.18). This consists of two octagons; each octagon contains one larger square and a lozenge surrounded by four elongated lozenges. A detail of one of the octagons (fig. 4.19) shows the four elongated lozenges forming the octagon, each lozenge contains two fish bubbles that are similar to the yin and yang symbol; similar to the soffit of the outer arcade (northeast) (fig. 3.46). The larger square contains a smaller square; each corner has a three-petal leaf; the inner lozenge contains an abstract three-sepal calyx. There is one lozenge that has a different motif (fig. 4.20) of two five-lobed vine leaves each surrounded by two elongated leaves, at the bottom and top is an abstract three-lobed leaf; the vine leaves are similar to those in soffit 3 northwest) (fig. 3.14).

5. This stucco revetment (fig. 4.21) is of style C; it has a border of three bands. The main motif is of geometric forms of triangles and squares with a bead border. One of the borders is similar to some of Ibn Tulun's borders; it is of a wave-like pattern with leaves (fig. 4.22) similar to soffit 5 (fig. 4.23), soffit 6 (fig. 4.24) and soffit 7 (fig. 4.25).



#### 4.4 Abbasid Geometric Patterns

The Abbasids preferred building with burnt and mud bricks that were then covered with carved or molded plaster with vegetal and geometric designs.<sup>228</sup> Similar stucco designs to Ibn Tulun have been found at Kharab Sayyar and the Noh Gunbad (Haji Piyada) mosque at Balkh.

Kharab Sayyar is an Abbasid city located northeast of Raqqa, dating from the 9<sup>th</sup>-10<sup>th</sup> CE. The stucco found there is a combination of the three styles of Samarra.<sup>229</sup>

1. A wall panel (fig. 4.26) shows a square containing two squares, four triangles and a circle; each of these geometric compartments contain vegetal forms. The circle contains a trefoil vasiform calyx pattern similar to variant C (fig. 4.27) in soffit 2 (fig. 3.4). The three triangles attached to the central square contain vegetal forms of a two-leafed vasiform pattern similar to soffits 6 and 9 (fig. 4.28).

2. The wall panel in fig. 4.29 is of stylized vegetal leaf forms; the left side consists of drop-shaped frames containing half palmettes and three-sepal calyxes. The half palmettes are similar to soffit 1 (fig. 4.30); the three-sepal calyxes are similar to soffits 3, 6, 7 and 10 (fig. 4.31). The right side consists of drop-shaped frames containing palmette patterns similar to soffit 1 (fig. 4.32) and two borders. The first border contains small two-leafed flowers similar to the flowers in soffit 9 (fig. 4.33). The second border is of a continuous leaf pattern similar to soffits 5, 6 and the NE entrance but the pattern itself is not similar to any of the soffits (fig. 4.34).

3. The wall panel in fig. 4.35 is of intersecting circles containing vegetal forms of palmettes and a ying and yang design (fish bubble). The intersecting bands forming circles (fig. 4.36) are similar to soffit 9. The palmette is similar to soffits 1 and 7 (fig.

<sup>228</sup> Creswell, *Early Muslim Architecture*, 2:370.

<sup>229</sup> Koppel, "Der Stuckdekor", 182.

4.37). The fish bubble design or ying and yang design is similar to the soffit of the outer arcade (that has two different ends) and the outer arcade of sanctuary (fig. 4.38).

4. The wall panel (fig.4.39) is of squares containing abstract vegetal designs; the two large squares contain bulky abstract vasiform leaves similar to the vegetal leaves in soffit 7 (fig.4.40). While the leaves in the left square are round and divided into three leaves, the leaves in the right square are fish bubble shaped similar to the soffit of the outer arcade of sanctuary (fig. 4.41). The small square between the two large squares contains two abstract “kidney-shaped” leaves usually has two curving elements similar to the non-extant soffit drawn by Owen Jones (fig. 4.42), in Jones the leaves are facing each other while in the Kharab Sayar panel the leaves are facing outwards.

The Hajji Piyada mosque at Balkh, northern Afghanistan, dates from the second half of the 9<sup>th</sup> CE. The stucco used is of styles A and B of Samarra.<sup>230</sup> The geometric grid design are similar to Samarra and Ibn Tulun.<sup>231</sup>

1. Soffit fig. 4.43 is of intersecting strapwork forming circles, which are connected to each other by small knots similar to soffits 7, 9 and 10 (fig. 4.44). The circles contain vegetal ornaments of a five-lobed vine leaf.

2. Soffit fig. 4.45 is of intersecting bands with small circles in the center, forming cross and star shapes. Its compartments contain vegetal ornaments of a stem form which spring vine-scrolls that end with a five-lobed leaf (fig. 4.46); the small squares contain a four-petalled flower similar to soffit 8 (fig. 4.47). The bands are similar to the double band of squares with a circle in the middle border in all the soffits in Ibn Tulun and the interlacing bands in the soffit of the outer arcade of the sanctuary at the entrance, shown in the non-extant soffits drawn by Jones and Prisse d’Avennes (fig.

<sup>230</sup> Golombek, “Abbasid mosque”, 177.

<sup>231</sup> Creswell, *Short Account*, 349.

4.48). The cross pattern is similar to soffit 2 and the star pattern is similar to that in the outer arcade of the sanctuary in Ibn Tulun (fig. 4.49).

3. Soffit fig. 4.50 is of octagons, rhombs and squares containing vegetal leaves. The octagon compartments are similar to soffit 1 first from the east at the north-west side; the rhombs are similar to soffit 7 (fig. 4.51).

4. The capital frieze (fig. 4.52) consists of alternating palmette tree designs with interlocking trefoil stalks of lotus.<sup>232</sup> The two palmette leaves that are on each side of the lotus stalk are kidney-shaped similar to the non-extant soffit drawn by Owen Jones (fig. 4.53).

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<sup>232</sup> Golombek, "Abbasid mosque", 180.

## Chapter 5

### Conclusion

The aim of this thesis has been to investigate the influences of Sasanian, Byzantine and Roman art on Islamic art; in particular on the stucco ornament of the soffits of Ibn Tulun mosque. The decorative style used in Ibn Tulun indeed shows a continuity of Samarra stucco and Byzantine and Roman mosaics; their influence was incorporated into Islamic design and further developed by local craftsmen.

The stucco decoration of the soffits are quite unique, the diversity and minute details of the patterns prove professional craftsmanship. Though the stucco show traces of Samarran, Roman and Byzantine influences, they are different. The artists combined the three styles of Samarra creating a new unique style; that was never repeated or copied in Egypt or outside Egypt.

The main Roman patterns, that were similar to the ones in Ibn Tulun, were mainly geometric patterns of interlacing circles, star patterns, rhombs and squares or purely vegetal for example the five-lobed and the three-lobed vine leaf explained in chapter four. Roman geometric patterns were purely geometric, while the geometric patterns in Ibn Tulun were combined with vegetal patterns. The main Byzantine patterns were naturalistic vegetal forms of naturalistic calyx, half palmette, the vasiforms and the scrollwork as seen in the Dome of the Rock and geometric patterns like the Byzantine cross and interlacing circles. Byzantine patterns were either purely geometric or purely vegetal, while in Ibn Tulun the geometric and vegetal patterns were combined together. In Samarra the three styles A, B and C were each used individually while in Ibn Tulun the three styles were combined together. Geometric patterns were used as frames filled with Samarran floral motifs.

Plant motifs and geometric patterns were frequently used in Roman and Byzantine arts and later on transmitted to Islamic art. The Roman, Sasanian and Byzantine five-lobed and the three-lobed vine leaf were commonly used in mosaics, they were also present on the soffits of Ibn Tulun. Parallels to the five-lobed vine leaf (fig. 5.1) are on soffits 1, 5, 7 and 9; while the three-lobed vine leaf (fig. 5.2) were commonly used in Roman mosaics. In fig. 5.2 an early example is shown for the three-lobed vine leaf from the Roman villa Loupian in Gaul dating second century CE similar to soffits 3,7 and 9. The interlacing vine scrolls adorned by grapes, leaves or palmettes were commonly used in Sasanian and Byzantine arts, early examples of naturalistic vine scrolls can be seen at the early Christian-Roman Ilissos Basilica in Athens dating fifth century CE similar to soffit 5, 6 and NE entrance (fig. 5.3). Roman and Byzantine vine scrolls were adorned with naturalistic vine leaves and grapes; in Islamic art it evolved into scrolls adorned with half leaves and palmettes. Palmettes are a typical Sasanian motif that were adopted by Byzantine art and evolved in Islamic art. An example of Sasanian stucco dating ca. sixth century CE from Ctesiphon (fig. 5.4) similar to soffit 1. The winged palmette, a typical Sasanian motif, was also found on some of Ibn Tulun's soffits. The winged palmette stucco from Ctesiphon dating sixth century CE is similar to soffits 1, 3 and 7 (fig. 5.5).

Geometric patterns were common in Roman mosaics composed of squares, rhombs, lozenges and interlacing circles. While during the Byzantine era the geometric patterns developed into a complicated and stylized patterns combined with vegetal motifs.<sup>233</sup> As shown in chapter four, Roman geometric patterns (figs. 4.2 and 4.9) parallels to Ibn Tulun soffits are the interlacing circles found in Posedonia are similar to soffit 3. The Byzantine geometric patterns of interlacing circles (figs. 4.2 and 4.9) found in Shiloh, San Vitale and Bishop Marianus are similar to soffit 3. The star rhombs pattern found in Pompeii

<sup>233</sup> [http://www.qantara-med.org/qantara4/public/show\\_document.php?do\\_id=560](http://www.qantara-med.org/qantara4/public/show_document.php?do_id=560)

and Clunia (fig. 4.5) are similar to soffit 2. The Byzantine cross is formed from different geometric patterns like squares, rhombs and stars (fig. 4.11) for example in Shunah mosaics and soffit 2 in Ibn Tulun.

Egypt was a melting pot for craftsmen from different regions, workers and craftsmen used to travel from city to city in search for employment, many of them were Syrians, Palestinians and Iraqis. Tulunid art was unique because craftsmen of different backgrounds worked on the mosques decoration; several craftsmen collaborated on each soffit, it is evident in soffit 1 first from the east (fig. 3.44) one pattern is repeated in all the octagons, the pattern differs from one octagon to another. The transmission of foreign influence “can be explained by the presence in Egypt of artisans trained in the Mesopotamian manner.”<sup>234</sup>

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<sup>234</sup> Bloom, “Transmission”, 23.

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