

MODELLING TRADITIONAL ISLAMIC CITIES

Nezar AlSayyad reports on the reconstruction of the historic urban form of Damascus and Cairo through text and computer applications.

Islamic cities have been the subject of various studies over the past few decades. They are usually described as organic, irregular and anarchic, with labyrinthine streets, no formal squares, no respect for geometry, and a negation of urban order. While this may be a fair description of some Islamic cities, it cannot be justified or understood unless it is placed in a wider historical context. For example, it is possible to attempt to reconstruct the early years of some of Arab Islam's best known orthogonal cities. Gridded cities such as Damascus, whose original form relates to its Greco-Roman roots, and planned cities like Cairo, which started as a regular geometric grid housing a new caliph and his entourage, are good examples of the transformative process in Islamic cities.

In the absence of detailed archaeological data, urban and architectural historians have had to turn to textual descriptions to reconstruct the early urban form of these cities. The Arab chronicles, written during the development of Islam, remain the richest source of Islamic urban history. For the purposes of this article, I rely almost exclusively on these chronicles to sketch various visual reconstructions of Cairo and Damascus during the early stages of their development. I will primarily rely on traditional figure-ground, linkage, and place diagrams as a way of analyzing the relationship of land uses, activity patterns, and institutional facilities. Clay models are also used to analyze the solid-void relationships, physical layouts, and circulation patterns. Computer simulations using advanced animation techniques are also used to give alternative reconstructions of the cities and to scan the transformative processes.

DAMASCUS

The city of Damascus has flourished throughout its history. Its earliest mention was when it was the capital of a small Aramaic kingdom in the eleventh century BC. Alexander the Great's conquest of Damascus in 333 BC was an important event for the urban form of Damascus. Characteristics of the city's plan included the Temple of Jupiter, the *agora*, a uniform grid, and small blocks of houses on standard-size lots (Fig. 1). Damascus then came under Roman rule in the first century BC, and by the beginning of the second century AD, under Hadrian, it was given the status of metropolis. The Roman plan was dominated by two great colonnaded streets. The first crossed the town from east to west like the *decumanus* of Roman cities, with several Roman arches. The second was the ancient road adjoining the temples and the *agora* (which had been transformed into a *forum*). A *castrum* was also built in the north-east corner of the city. The Romans gave the

city its rectangular shape, measuring 500 x 750 feet. It was surrounded by a defensive wall penetrated by seven gates: the eastern gate, the al-Jabiah gate to the west, three gates to the north including the Thomas Gate in the north-east, and two gates to the south (Figs. 2, 3).

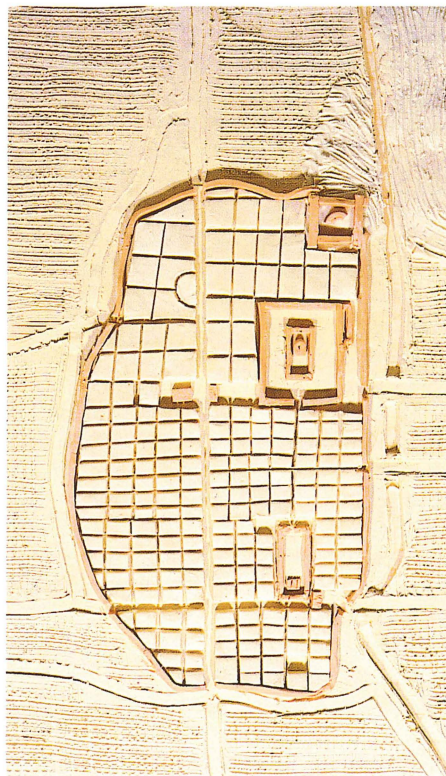
In 395 AD Damascus became part of the Byzantine Empire, and the church as a building type was introduced to the city. The Temple of Jupiter which by now had fallen into disuse was rebuilt and transformed into a church dedicated to St John the Baptist. The western hills of the city (which were later included in the Roman wall) contained, in addition to the *castrum*, a Byzantine palace (Fig. 4).

By the time Damascus fell to the Arabs, the general weakening of government authority had brought about a disregard for building codes, and physical order in the city had started to disintegrate. However, although encroachments on the streets had occurred, the grid was still functional and visible. The Arabs seem to have been very impressed by the city's regularity, especially its long *decumanus* which they called 'the straight', a name that remained in use for almost ten centuries.

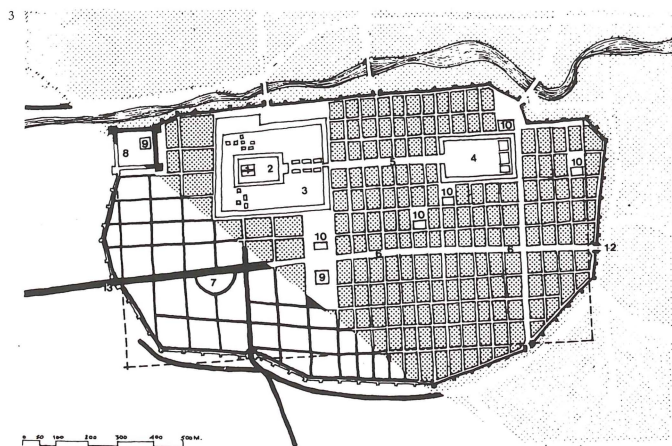
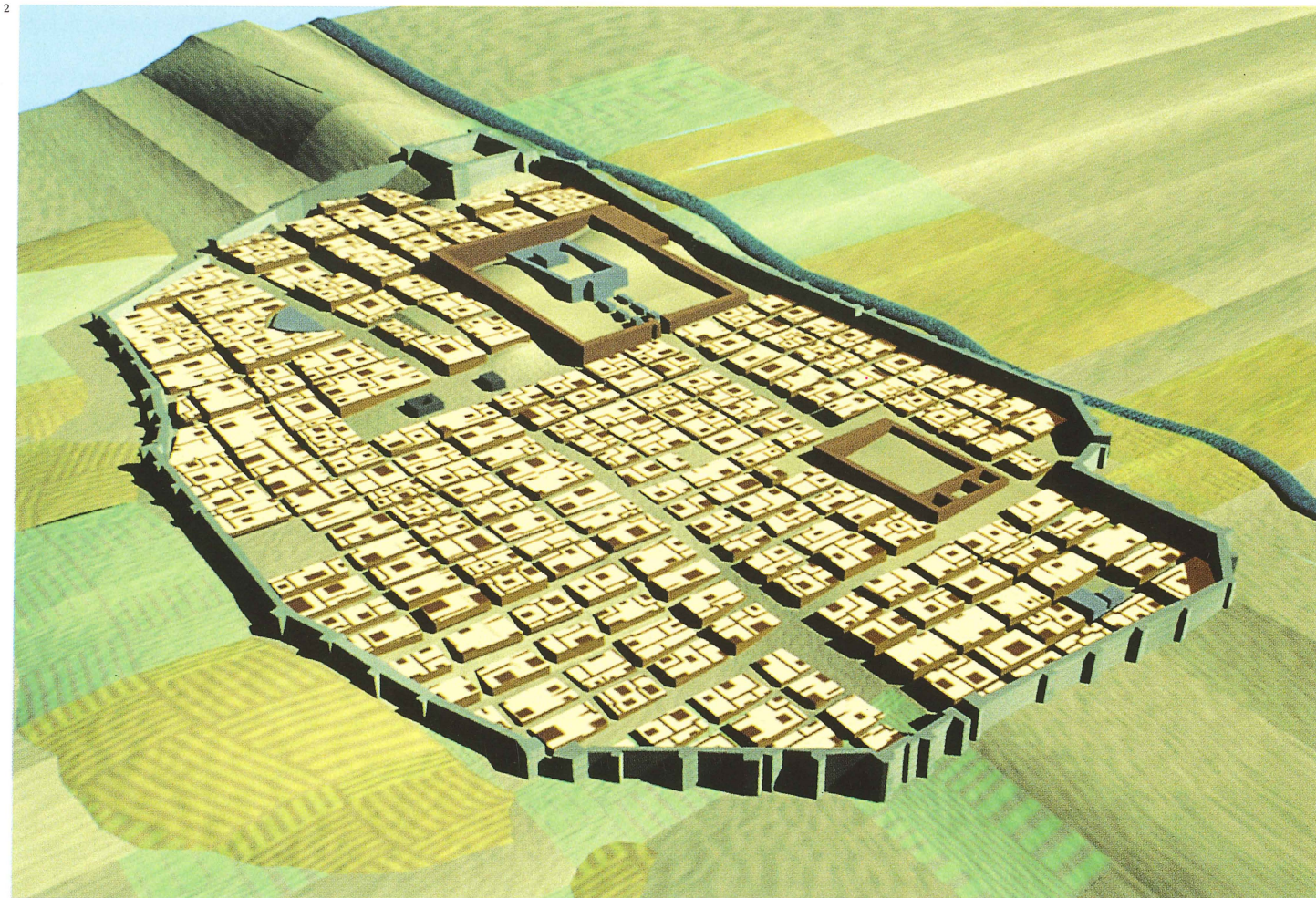
Initially, Arab domination did not greatly affect Damascus, although several groups of the Greek-speaking population fled the city, leaving a considerable amount of their property to be occupied by the incoming Arabs.

There are many stories in the various chronicles about the nature of the treaty signed between the Arabs and the Christians. Al-Baldhri mentions, for example, that al-Waqidi, who allegedly saw the text of the treaty signed by Khaled (a debated issue in itself), reported that it did not contain any reference to the division of homes or churches. Many scholars have reached the conclusion that the details surrounding the takeover of Damascus belong to the systemization of subsequent generations of legal scholars seeking to rationalize the event.

Whether it was due to voluntary evacuations or dispossession, the vacant houses of Damascus were gradually settled by the Muslim Arabs. Although we know very little about where the Arabs lived exactly, we do



1. A clay model reconstruction of Damascus before the Arab conquest.

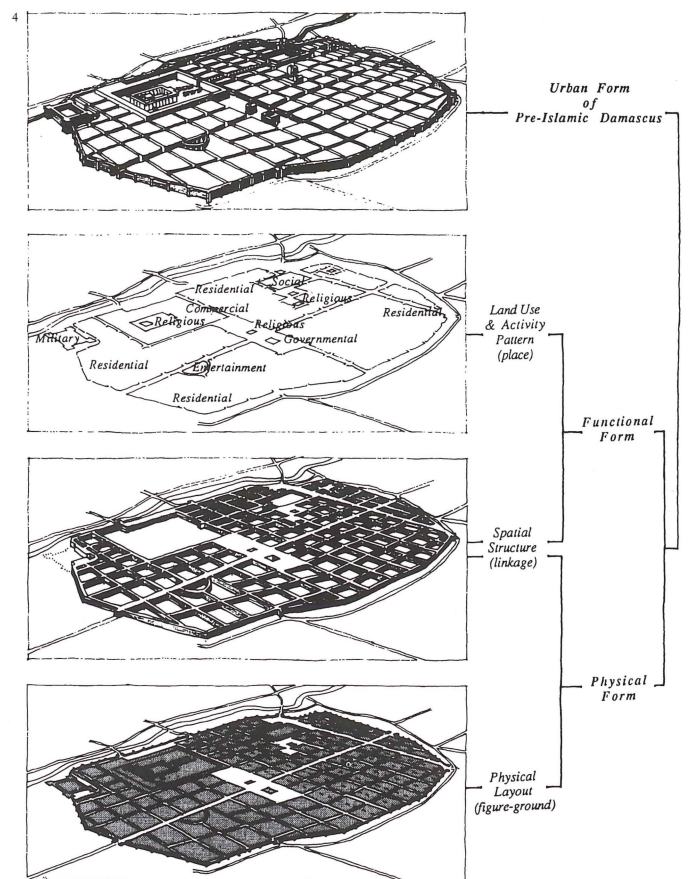


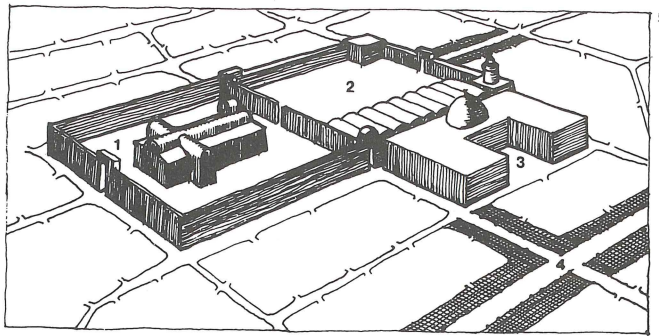
1. Temple of Jupiter turned Church of St. John 2. Temenos 3. Peribolus with shops added 4. Agora turned Forum with shops 5. Colonnaded Street 6. Decumanus later named The Straight 7. Theater transformed to warehouses 8. Castrum 9 Byzantine Palace 10. Byzantine Church 11. Thomas Gate 12. Eastern Gate 13. Jabiah Gate

2. A computer reconstruction of pre-Islamic Damascus.

3. The plan of Byzantine Damascus at the beginning of the seventh century before the Arab takeover (based on Sauwaget, Elisseeff, and the Arab Chronicles).

4. The urban form of pre-Islamic Damascus analyzed.





1. Church of St. John
2. Umayyad Mosque
3. Al-Khadra Palace
4. Market/Colonnade turned Bazaar

5. A reconstruction of the Mosque of Damascus, the Church of St John, and the palace of Mu'awiyah (based on Ibn 'Asaker).

know that they did not establish any special quarters. The commanders of the different garrisons seem to have taken over a number of vacated houses in a variety of locations.

Perhaps the most significant story in the Arab transformation of Damascus concerns its mosque. The site the Arabs chose was, of course, that of the former Church of St John. Ibn Jubair contends that the Muslims divided the *kanisa*, or 'church', into two parts, the Muslims occupying the eastern half. But this alleged partitioning of the church has been refuted by many scholars. Some have pointed out the impossibility of such a relationship; others attribute the confusion to an error in translation. K.A.C. Creswell concluded that the Muslims simply took over the eastern half of the old temple, or the *temenos*, which was outside the church building (Fig. 5).

Creswell's explanation seems to conform with what the Christians were guaranteed in their treaty with the Arabs. But how did the Muslims pray in this space, the *parvis*, outside the church? What were its physical and functional qualities? Was any part of it sheltered, and what may have been its relationship to the *qibla*. A few of the chronicles refer to the mosque adjacent to the church in Damascus as a *musalla*. This term was first used in Medina to refer to the place outside the city where the Muslims gathered for the Eid prayer. It was only later that a structure was built in the *musalla* of Medina. A similar process may possibly have occurred in Damascus, in which the act of building was not in itself a perpetuator of the Arab or Islam influences on the city.

Although it is only one story in the history of the Damascus takeover, the story of the mosque is a good example. The Arabs did not behave differently with any of the other building types they occupied, and little or no structural change occurred to Damascus – at least not until the Umayyads made it their capital in 661 AD.

Under Mu'awiyah, Damascus became the capital of the Umayyad caliphate. Building on his previous experiences as governor of the

region, and following the already existing Byzantine model, Mu'awiyah founded the administrative institutions of Damascus; under his rule, Islam began to breathe more of the Mediterranean and less of the desert. Mu'awiyah modified the caliphate and from the beginning appears to have had the intention of changing it into a monarchy. Although the practice of ruling as king was considered non-Islamic by the early Muslim jurists, and the term *malek* was detested by his Arab subjects, Mu'awiyah went ahead with plans to build a dynasty that could compete with those built by Europeans.

When he was governor, Mu'awiyah lived in one of the old Byzantine palaces in the city. A few years after taking over as caliph, he built himself a palace. Mu'awiyah's palace was referred to as al-Khadraa, or the 'green palace', because it supposedly had a large green dome. According to Ibn 'Asaker, the palace was built of bricks and placed adjacent to the south wall of the mosque facing the *qibla*. Also using the *kiblah* side of the mosque, the earlier relation-

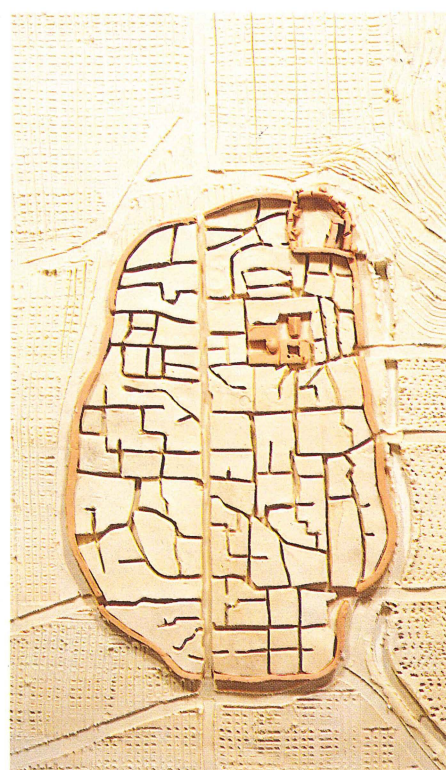
ship of Dar al-Imarah to the mosque in both Basrah and Kufah is similar.

It is unlikely that this relationship in Damascus was accidental, but it is difficult to trace it back to such a precedent or to establish that Mu'awiyah was trying to duplicate a pattern he had seen before. From Ibn 'Asaker, we know that the palace underwent several modifications during the reign of Mu'awiyah. He reports that upon seeing the palace, the Byzantine ambassador to Damascus commented, "This is no palace, for its top is for birds, and its bottom is for fire." This seems to have prompted Mu'awiyah to enlarge the palace and rebuild it in stone.

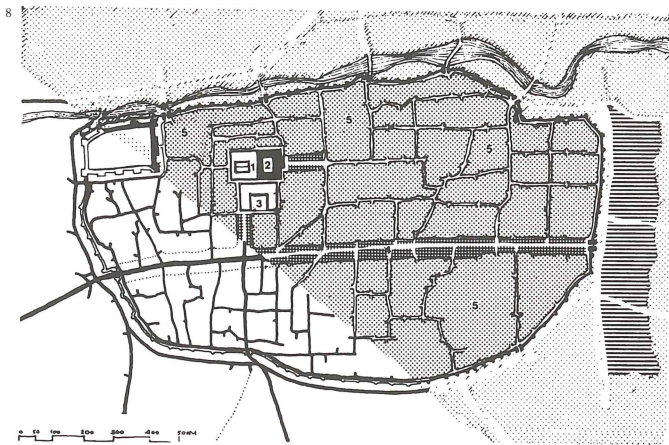
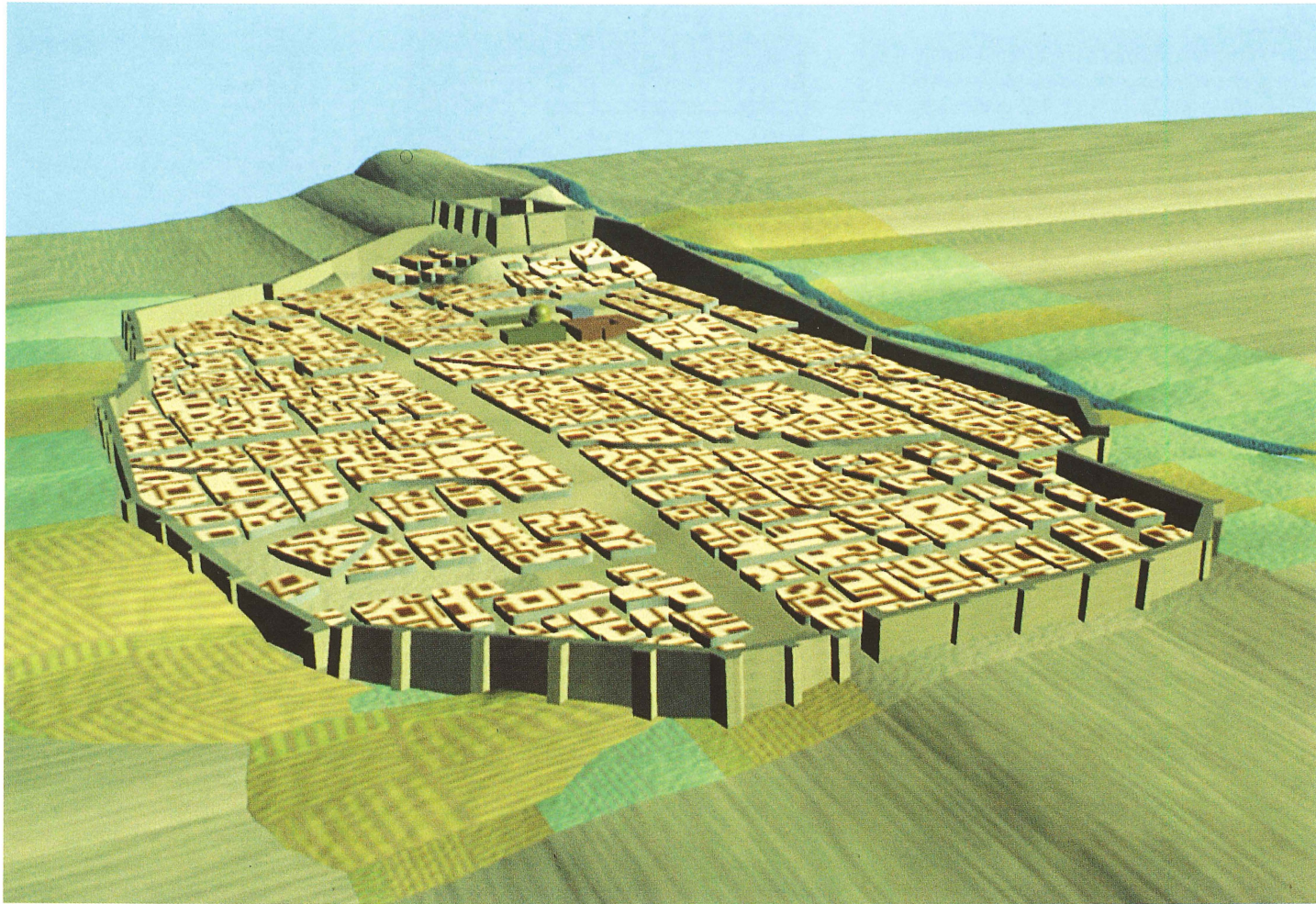
The palace of Mu'awiyah seems to have contained two distinct quarters: his family residence and his administrative court. In fact, the title 'green palace' may have been given to an entire administrative building complex, of which Mu'awiyah's house was only a part. In fact, Elisseff even believes the 'green palace' was only a remodelling of the former Byzantine palace. But even if this is right, it should not reduce the importance of seeing the mosque and the caliph's quarters as representing the unity of state and religion in the rising power of Islam.

Even though it was the capital city under Mu'awiyah, neither the physical form nor the daily life of Damascus changed much. Greek was maintained as the language of administration, and the general image of the city remained the same in spite of its major cultural transformation. The alleged irrationality of the streets of Damascus and its spatial organization has been a subject of great debate (Figs. 6, 7). The prevailing idea among researchers is that the irregularity of the streets was a manifestation of some anarchic principle inherent in the Islamic urban system. This view was mainly espoused by Jean Sauvaget, whose attempts to reconstruct the Greco-Roman plan of Damascus and Aleppo led him to the conclusion that the regularity of the streets was preserved down to the Islamic era, but was lost under the influence of the Arabs (Figs. 8, 9).

However, X. de Planhol popularized this idea and stigmatized all Islamic cities as cities lacking any order. He suggested that "the religion of Islam leads to a negation of urban order." However, Von Grunebaum later pointed out that the decomposition of the Damascus grid had begun as early as the second century AD, and he attributed the transformation to a weakness of government authority. Although this is partially true, it is difficult to know when this transformation was actually consummated and what the forces were that brought it about. The one thing we do know is that the general image of the city was not radically changed by the Arab occupation and that whatever changes were taking place in its streets were part of an ongoing process.



6. A clay model aerial reconstruction of Islamic Damascus.

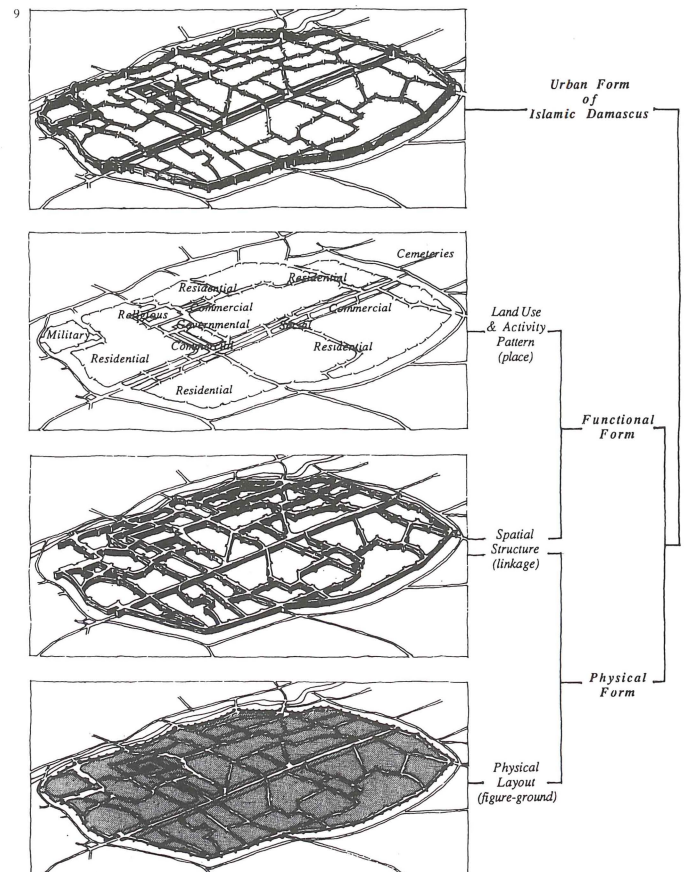


1. Church of St. John 2. Umayyad Mosque 3. Al-Khadra Palace 4. Market/Colonnade
5. Residential Quarters 6. Cemeteries

7. A computer reconstruction of Islamic Damascus.

8. The plan of Islamic Damascus (based on al-Munjid).

9. The Urban form of Islamic Damascus analyzed.



CAIRO

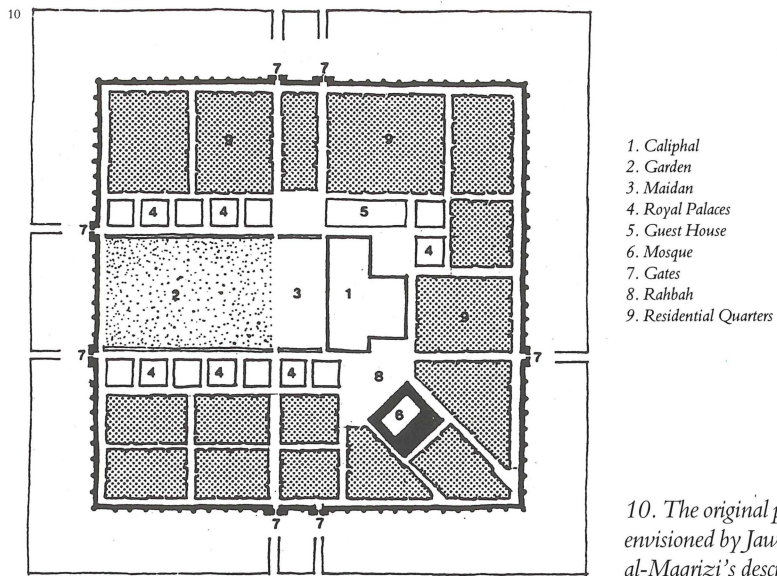
After successive attempts, the Fatimid movement gathered enough momentum to permit the conquest of Egypt, and almost immediately, the Fatimid caliph's envoy, Jawhar, began the search for a site to garrison his troops. According to at least one account, he carried with him some ideas about the construction of a new capital, which Caliph al-Mu'izz envisioned as the seat of his caliphate and a rival to Baghdad. As Jawhar had to impose on this fragmented region his predetermined plan, he located the new city in the only site available to him to the north of the existing settlements. Seen in this context, al-Qaherah was another addition to an existing pattern of cities that paralleled the Nile. Jawhar's first step was to lay down the city wall, determine the location of gates, and start construction of the two major buildings: the caliphal palace and the mosque. Legend has it that the following day, when a delegation from Fustat went to welcome Jawhar, they found that the foundations for the entire city had already been dug. The chronicles contain no mention of architects or builders being involved, suggesting that his army may have included individuals with such specialized skills.

Al-Maqrizi, the renowned historian of Cairo, relates that Jawhar initially planned the city as a square with sides equalling 1,200 yards (1,097 metres) each. This defined a total area of 340 acres (138 hectares), of which 70 acres (28 hectares) were allotted to the caliphal palace and another 70 acres to the existing gardens, al-Bustan al-Kafuri, and to new squares, or *rahbahs*. The remaining acreage was assigned as *khutah* to the 20 different groups making up the army (Fig. 10).

Al-Maqrizi also reports that Jawhar was in such a hurry that he ordered his soldiers to carry on throughout Friday night and only in the morning realized the plan had been implemented with a slightly distorted rectangular shape. He then decided not to correct it, saying that "it was laid out in a holy night and that its irregularity must have been caused by a divine logic" (Fig. 13). It is unlikely that, during its execution, the plan could have been distorted from its original square shape into a rectangle, as some scholars believe. The sides of the executed plan carry the proportion of 2:3, one that is not likely to have happened accidentally.

Four years after the conquest, Caliph al-Mu'izz arrived at the new city and declared it the capital of his caliphate. He then changed its name to al-Qaherah, meaning 'the Victorious'. The name was later distorted by Italian travellers to its current English name: Cairo.

From the beginning, Caliph al-Mu'izz was intent on creating an imperial capital with an instant sense of history. From Tunis he



10. The original plan of al-Qaherah (Cairo) envisioned by Jawhar (reconstruction based on al-Maqrizi's description of the plan).

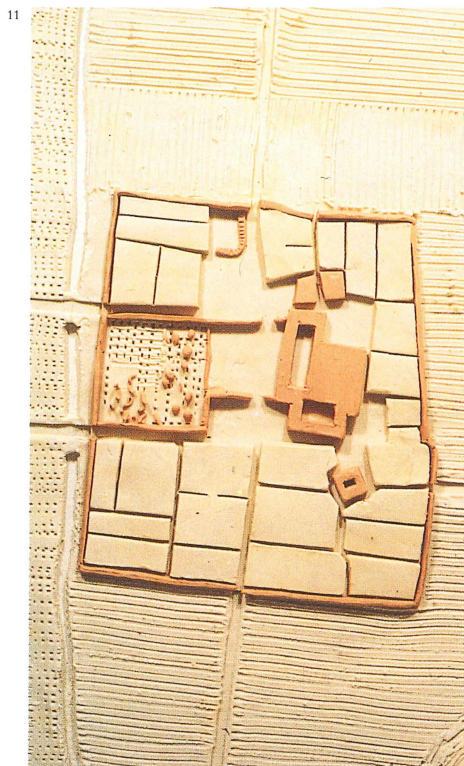
brought with him three coffins enclosing the remains of his predecessors, and he ordered their burial at a site close to his palace. On his arrival in the city, the caliph led the first public prayer, setting Cairo on a track that would make it the religious and intellectual capital of the Muslim world for years to come.

Al-Maqrizi's description of the different urban elements that make up the Fatimid city exceeds 200 pages, and of this he devoted a considerable portion to its palaces. He reports that Jawhar and his forces camped to the south of the site of al-Qaherah, and that they immediately started building its city walls. Al-Maqrizi also relates that Jawhar started concurrently the construction of the main palace in 969 AD. (Figs. 11, 12). On its western side, the palace bordered the central square, or the *maidan*, which was later circumscribed by the addition of another caliphal palace further to

the west. Mubarak relates that the *maidan* acted as a place where the caliph reviewed his troops, accommodating 10,000 soldiers. As in Baghdad, the first Islamic planned capital, the caliphal palace was isolated from its surroundings by squares and gardens. To its west was al-Bustan al-Kafuri, a large garden established as a resort during the time of the Ikhsheds. This was walled and connected by underground tunnels to the caliphal palace and in the early days was reserved for use by the caliph and his family. From the north and the east, *rahbahs* separated the caliphal palace from the guest house and the *khutah* of al-Barqiya respectively.

While the construction of the palace was going on, Jawhar embarked on building a Friday mosque to the south of the palace, separated from it mainly by a *rahbah*. Al-Maqrizi relates that construction of the mosque started in 970 AD, and that it was completed three years later. Caliph al-Mu'izz led the first Friday prayer and delivered the *khutah* sermon on the first Friday of Ramadan in 972 AD.

The *haras*, or residential quarters of al-Qaherah, occupied its outer circumference, although the scale of construction here was very different to that at the city centre. There were originally 20 *haras*, one assigned to each of the tribes making up the Fatimid army. The balance achieved between these tribes and their representation in the government of



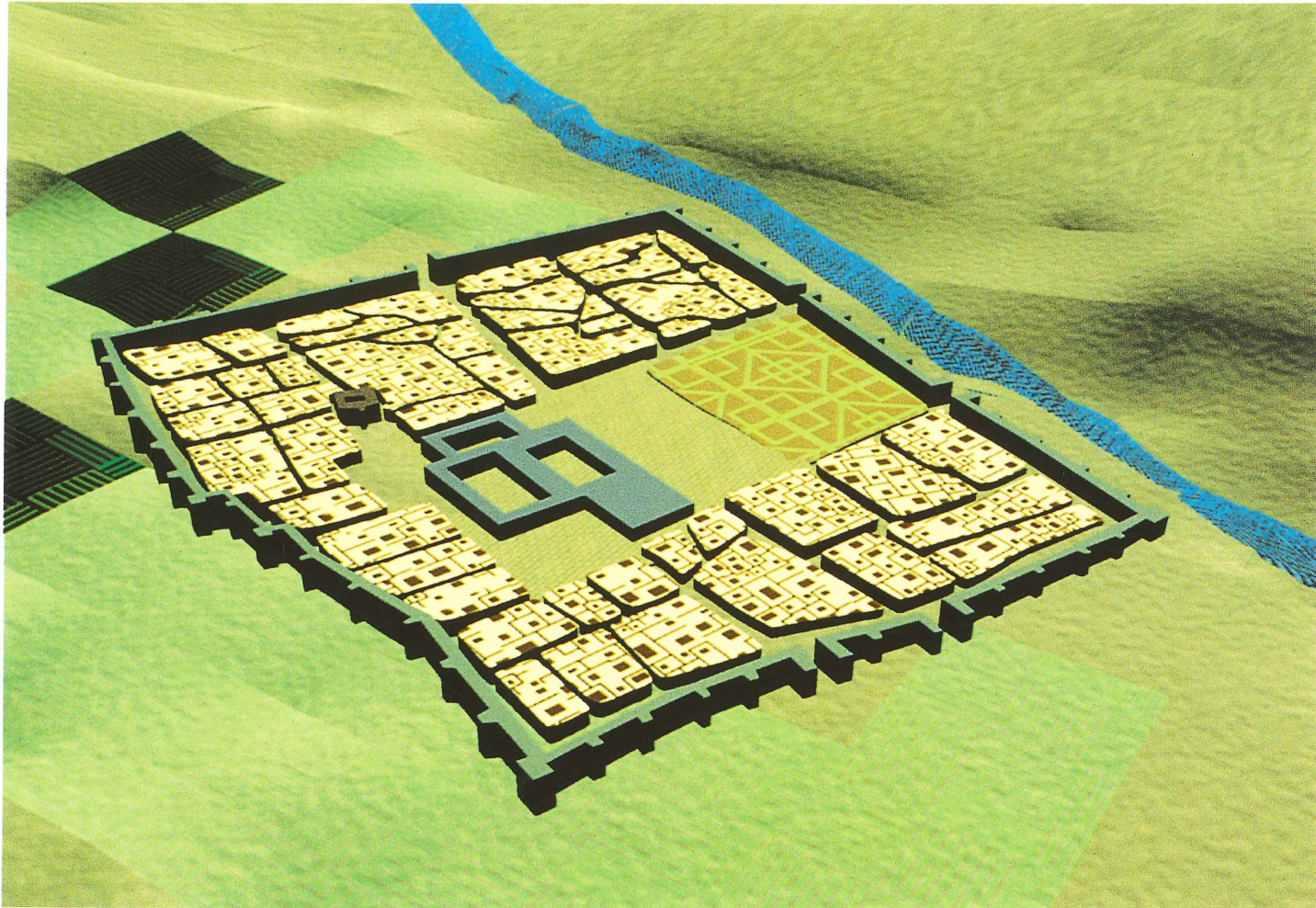
11. A clay model reconstruction of early Fatimid al-Qaherah.

12. A computer model reconstruction of early Fatimid al-Qaherah.

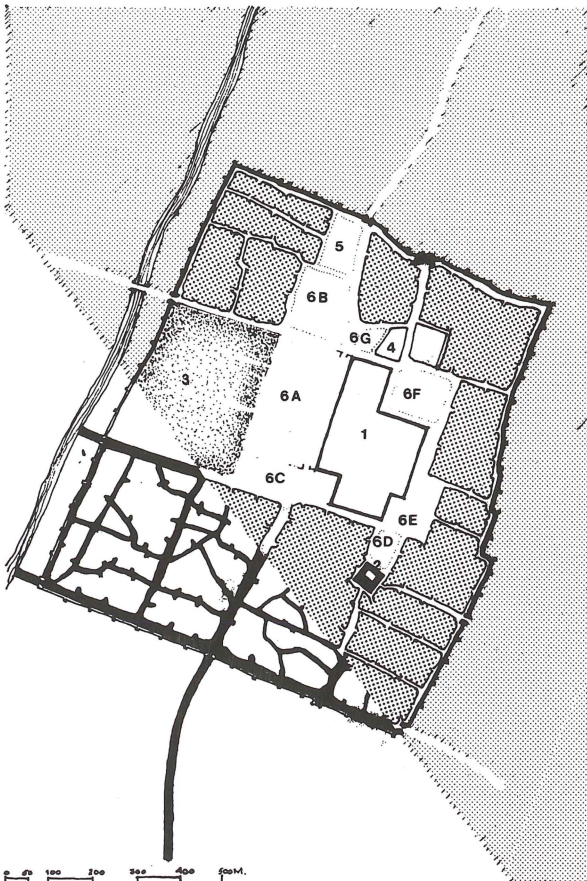
13. A reconstruction of the plan of al-Qaherah as implemented on site (based on the Egyptian Geographic Society Map of 1922).

14. A reconstruction of early al-Qaherah, showing the caliphal palace isolated from its surroundings by open spaces (based on al-Maqrizi).

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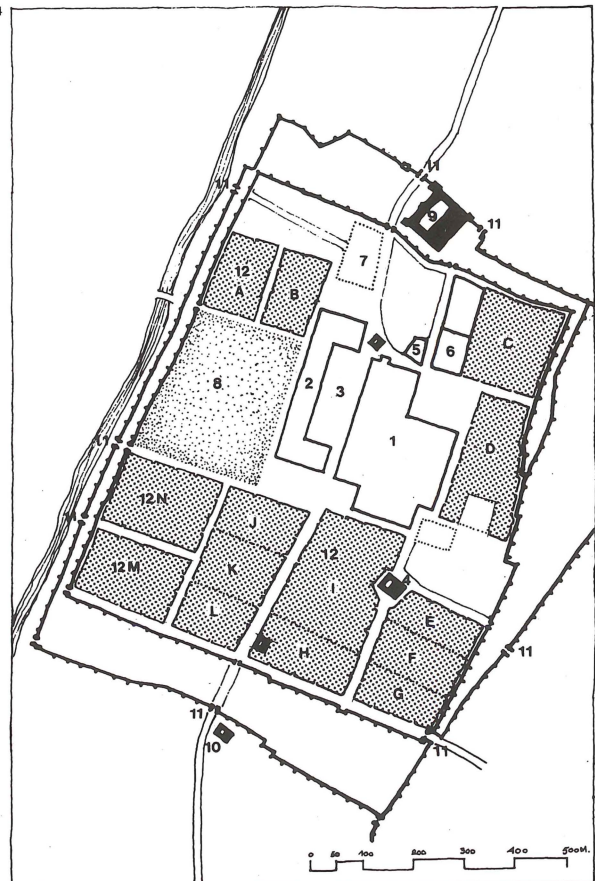


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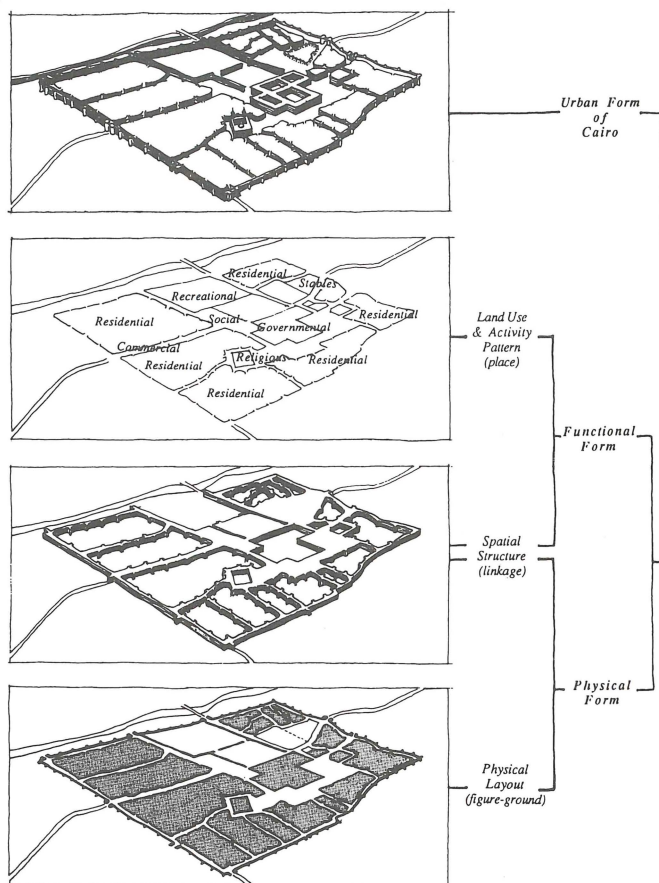
1. Caliphal Palace
2. Al-Azhar Mosque
3. Palatial Gardens (Al-Bustan al-Kafiri)
4. Guest House (Dar al-Diafah)
5. Stables
6. Squares:
 - A. Caliphal Square (Al-Maiydan al-Kabir)
 - B. Maiydan al-'Ikshid
 - C. Rahbah al-Qasr
 - D. Rahbah al-Azhar
 - E. Rahbah Qasr al-Shouk
 - F. Rahbah al-'Id
 - G. Rahbah Dar al-Diafah

1. Big Eastern Palace
2. Small Western Palace
3. Palace Square
4. Al-Azhar Mosque
5. Guest House
6. Minister's House
7. Stables
8. Kafuri Garden
9. Al-Hakim Mosque
10. Mosque
11. Gates
12. Residential Quarters:
 - A. Farahiyah
 - B. Bergoan
 - C. 'Outoufiyah
 - D. Barqiyah
 - E. Koutamah
 - F. Tawareq
 - G. Sharabiyah
 - H. Greek
 - I. Daiylam
 - J. 'Umarah
 - K. Judariyah
 - L. Zuaiylah
 - M. Mahmudiyah
 - N. 'Uzriyah

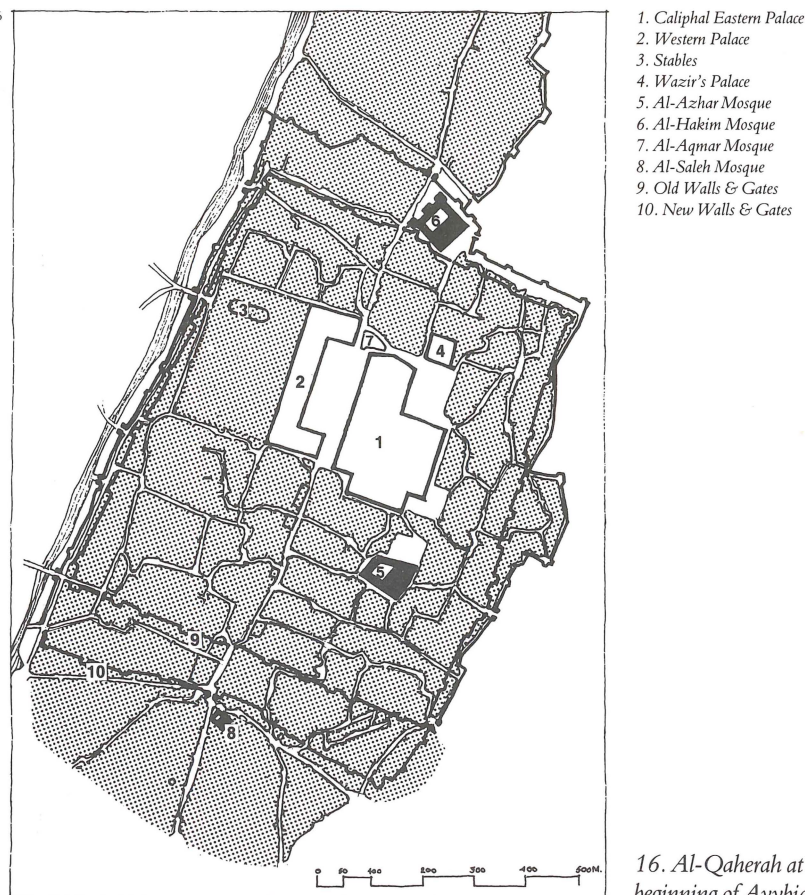
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15. The urban form of Fatimid Cairo analyzed.



16. Al-Qaherah at the beginning of Ayybid rule.

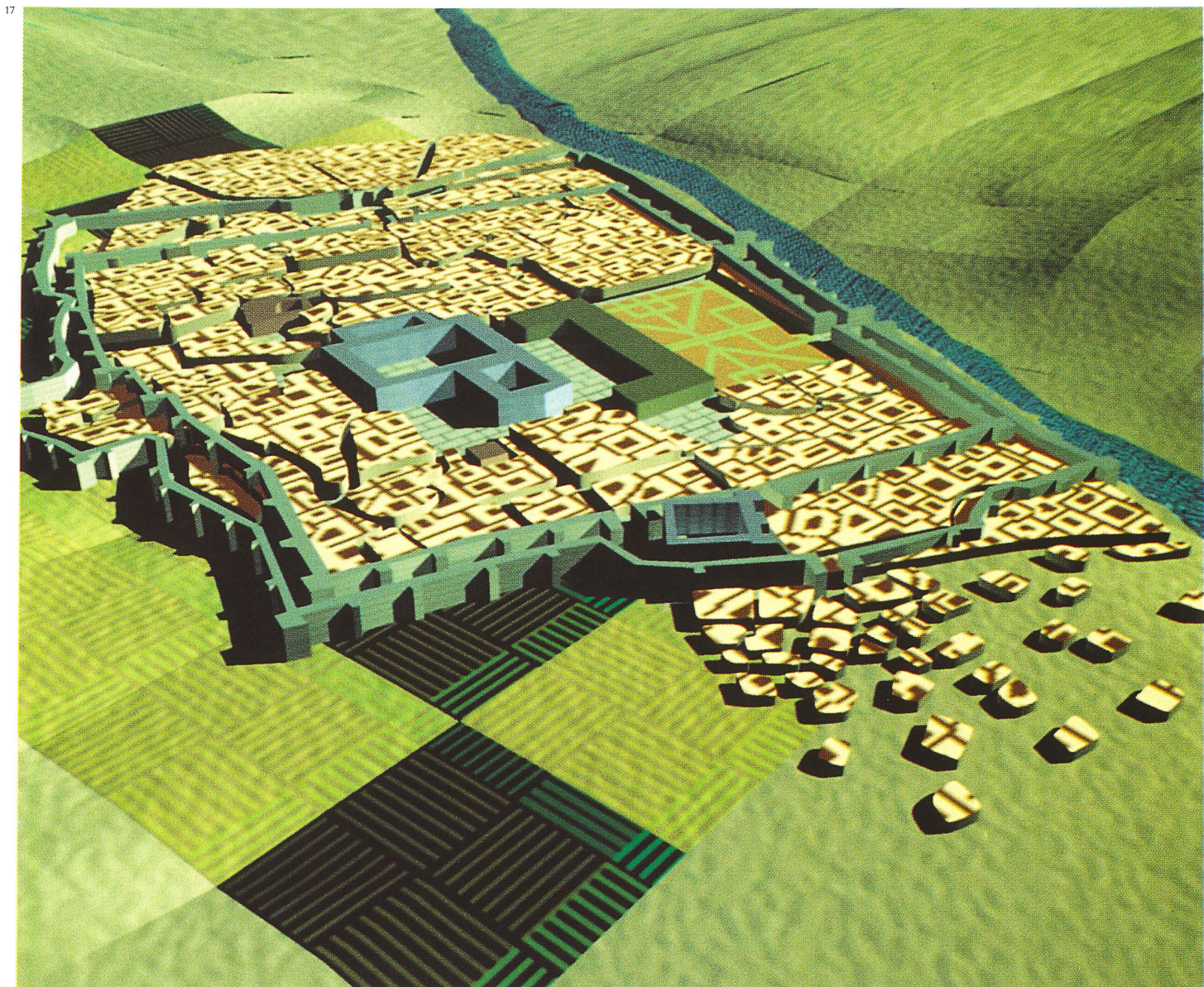
Fatimid Cairo was of major importance to its urban existence. Unlike the early garrison towns, which were made up of tribes that mostly came from Arabia, al-Qaherah was not populated by a homogeneous group. Urban order existed by virtue of a system that allowed different groups a share in government.

As a private, princely town, the original city does not seem to have contained a major market; none of the chronicles give any mention of such activity. However, it is probable that during its early days al-Qaherah contained warehouses and small neighbourhood markets, as leaving the city for daily shopping would have been very inconvenient for residents. This situation changed as al-Qaherah grew larger and developed a balanced relationship with its twin city, Fustat.

The image of the original city of al-Mu'izz, therefore, seems to have been one that conforms to a regular grid with wide streets and large open squares, very different to the stereotyped image of the Muslim city (Figs. 14, 15). It was al-Mu'izz's vision which brought al-Qaherah into existence, but he did not live to enjoy it. His son al-Aziz took over the caliphate, and he was a great builder, adding several important buildings to al-Qaherah during his 20-year reign. The first, the small western palace (also known as Qasr al-Bahr), was of great urban significance to the city, as it defined the central *maidan* of the city and separated it from the caliphal gardens. The second, the Anwar mosque, which later became known as the mosque of al-Hakim, was initiated to act as a new *khutbah* mosque to accommodate the Friday and feast prayers. The urban significance of this mosque, which was built outside the Bab al-Futah gate, is that it was the first Fatimid mosque to be built outside the walls of a city. Its construction, utilizing materials from a dismantled ancient Egyptian building, also signalled a change in the pattern of religious preaching in Cairo. For the first time the Friday *khutbah* was held in more than one mosque: the mosque of Amr in the city of Fustat accommodated the Sunni *khutbah*, while the Shiite *khutbah* was held in the mosque of al-Hakim.

When Badr al-Jamali, the Fatimid governor of Syria, was called to take charge in 1068 AD, he renewed the appearance of al-Qaherah. He enlarged the city by building a new stone wall and a series of new gates, so taking the buildings that were outside the wall. For the first time, al-Qaherah was given the appearance of a fortified city, a feat primarily achieved by using recycled stone from nearby ancient Egyptian temples and by importing skilled builders of defensive structures from Byzantium.

In its heyday Fatimid al-Qaherah was an impressive city. Although it was originally



17. A computer reconstruction of al-Qaherah at the beginning of Ayybid rule.

envisioned as a large palatial compound, it quickly developed into a full-scale urban centre. The Persian traveller, Nasiri Khusraw, who resided in the city from 1047 to 1050 AD, gives a brief description of the extent of its trade and commerce; the number of shops inside the city exceeded 20,000, accommodating all types of commercial activity. All the shops were owned by the caliph and were rented, and most of the shop tenants commuted from Fustat. No one was allowed to own commercial or residential property in al-Qaherah except the caliph.

Before the end of Fatimid rule, the cities of al-Qaherah and Fustat existed side by side and acted as a single urban centre which served as the true capital of the Fatimid caliphate and the most important city of medieval Islam. The regular pattern of the planned city later started to disintegrate and look more like its older neighbour, Fustat (Figs. 16, 17).

CONCLUSION

The findings of this exercise are very useful, and the tools used to achieve them are essential. Charting the physical forms of cities at various stages of their development gives a glimpse of how the residents of these cities may have experienced them. It also allows the opportunity to understand and decipher the reasons behind certain urban decisions. The forms of cities like Damascus and Cairo were not only the result of responses to social and legal codes, but they incorporated elaborate acts of single individuals with both will and power.

A true and complete understanding of the history of Islamic cities requires the creation of a historic database linked with visual images. Computer simulations are proving to be very effective mechanisms in analyzing the history of urban form: they allow for the visual addition of new textual, architectural and archaeological findings; they can be used as tools for the implementation of historic preservation programmes; they are useful in pro-

ducing animated images for teaching purposes; and their potential use as a tool for designing in historic districts is evident. For both designers and historians interested in the history of urban form a new door is being opened, the potential of which seems almost limitless.

REFERENCE NOTE

The research for this article is derived from Nezar AlSayyad's *Cities and Caliphs: On the Genesis of Arab Muslim Urbanism*, Greenwood Press, New York, 1991. The computer simulations were conducted by Ana Pinto Da Silva and Allonzo Addison at the University of California, Berkeley, Department of Architecture, Silicon Graphics lab.

Nezar AlSayyad is an architect, planner and urban historian currently on the faculty of the Department of Architecture at the University of California, Berkeley. He has written several books and articles on housing, Islamic architecture, traditional settlements and third world urbanism.