

*Middle East Garden
Traditions: Unity and
Diversity*



Edited by Michel Conan

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Introduction	
Michel Conan	
<i>Learning from Middle East Garden Traditions</i>	3
New Perspectives for Garden Archaeology	
Yizhar Hirschfeld	
<i>The Rose and the Balsam: The Garden as a Source of Perfume and Medicine</i>	21
Yotam Tepper	
<i>Soil Improvement and Agricultural Pesticides in Antiquity: Examples from Archaeological Research in Israel</i>	41
Antonio Almagro	
<i>An Approach to the Visual Analysis of the Gardens of Al-Andalus</i>	55
Expiración García Sánchez and J. Estaban Hernández Bermejo	
<i>Ornamental Plants in Agricultural and Botanical Treatises from Al-Andalus</i>	75
The Political Uses of Gardens	
Mohammed El Faïz transl. by Maryrica Ortiz Lottman	
<i>The Garden Strategy of the Almohad Sultans and Their Successors (1157-1900)</i>	95
Mahvash Alemi	
<i>Princely Safavid Gardens: Stage for Rituals of Imperial Display and Political Legitimacy</i>	113
Jean-Do Brignoli	
<i>The Royal Gardens of Farahābād and the Fall of Shah Sultan Husayn Revisited</i>	139
Ebba Koch	
<i>My Garden is Hindustan: The Mughal Padshah's Realization of a Political Metaphor</i>	159
James L. Wescoat Jr.	
<i>Questions about the Political Significance of Mughal Garden Waterworks</i>	177
Cultural Receptions of Gardens	
Nurhan Atasoy	
<i>Matrakçı Nasuh and Evliya Çelebi: Perspectives on Ottoman Gardens (1534-1682)</i>	197
Abdul Rehman and Shama Anbrine	
<i>Unity and Diversity of Mughal Garden Experiences</i>	221
Critical Discussion of Cultural Influences	
B. Deniz Çalış	
<i>Gardens at the Kağithane Commons during the Tulip Period (1718-1730)</i>	239
Jennifer Joffee and D. Fairchild Ruggles	
<i>Rajput Gardens and Landscapes</i>	269
Exploring the Limits of Garden Traditions	
José Tito Rojo and Manuel Casares Porcel	
<i>From the Andalusí Garden to the Andalusian Garden: Remnants and Re-Creation</i>	287
Benedict Bull	
<i>Gardens of Afghanistan</i>	307
Contributors	329
Index	336

An Approach to the Visual Analysis of the Gardens of Al-Andalus¹

Antonio Almagro

The garden is one way for man to leave his imprint on nature, to mold it to delight and beguile the senses. All cultures have sought to adapt nature, selecting its most beautiful and pleasing features, while casting aside those which are troublesome or unpleasant. The garden is, above all, part of man's quest for pleasure, although in many cases it is also imbued with transcendental values. Conceived by and for man, in almost every culture it has formed an indissoluble part of the surroundings of any habitat, in town and country alike. But the garden has been linked to power in a special and intimate way, because in offering joy and pleasure to its owners, it becomes a sign of distinction and authority for those who are in a position to create and maintain them. The garden is as ancient as culture itself. It was present in the earliest civilizations and associated with all the significant beliefs of man. Gardens have always constituted part of the most authentic manifestations of every culture.

The conservation of gardens is one of the most difficult cultural challenges to be solved. The changing and transitory character of many of their elements makes these creations difficult to be conserved in the long term and, therefore, their restoration sometimes poses unsolvable difficulties. New technologies and scientific knowledge can help much in this labor, which ought to be more extensively developed in the future. This study aims to show a way to search for solutions for this challenge. Some of the gardens we present here reconstructed virtually could still be reconstructed in reality because the space they occupied is still empty. Other gardens, however, can never be rebuilt as the introduction of new creations of a high historical and artistic value on the same site makes inadvisable any kind of work in that direction.

In the palatial architecture of al-Andalus, there hardly exists a palace without a garden, as can be clearly observed both from the examples which have reached the present day intact and from those which have fallen into neglect or been transformed. We find two different types of garden in the houses and palaces of al-Andalus. In the majority of cases the garden is circumscribed by or within the overall architectural plan, inside courtyards which are sufficiently spacious to allow for the planting and growing of trees and flowers, as well as for structures for irrigation and for the inclusion of water as an integral feature in the garden. In other cases, gardens and orchards appear more as surrounding arrangements which frame and enhance the attributes and splendors of a royal dwelling or add to the simple delight of harvesting their fruits.

Almost no palace in al-Andalus has reached present times in a state of conservation similar to that of its past splendor, nor does it maintain the primitive layout of its gardens. Not even in cases like the Alhambra may we speak of the authentic survival of the original gardens. Because a garden, unlike architecture, is a living reality, as it is composed of

living things which are born, grow and die, which are constantly changing from season to season and from year to year. A garden is never the same from one day to the next. Precisely for this reason it is especially sensitive to changes in fashion, to botanical innovation and particularly to neglect and abandon. If it is left uncultivated it deteriorates rapidly, above all in dry climates where the lack of water causes the rapid disappearance of the majority of its features.

To give only one example, recent research carried out by Manuel Casares and José Tito (Casares *et al.* 2003a; Piñar and Tito 2005), regarding the transformation of such an emblematic garden as the Patio de la Acequia of the Generalife (c.1275), brings to light the changes which a garden may undergo in as little as 150 years, all of them well documented with absolutely reliable images. Many of the completely different forms in which the garden appears in the analyzed representations are due to attempts to return it to its "original form," according to the criterion of the restorer of that time. This confirms how difficult, if not impossible, these attempts frequently are.

Although nowadays a lot of restoration work attempts to apply maximum scientific precision to the recovery of areas under cultivation and to the original irrigation systems (Casares *et al.*, 2003b), and although research attempts to bring to light the nature of the original plant types by means of edaphic and pollinic analysis, information about their distribution and organization, size and shape turns out to be far more difficult to know. Resorting to written testimony, whether literary or graphic, only contributes limited and generic data which rarely provide a clear guide to the real shape of a given garden. Unless precise documentation is available, both of literary description and images (and this was almost unthinkable in medieval times), the most we can aspire to is to recuperate the general feeling of a garden from archaeological information and generic descriptions of the class of plants used and the way in which they were laid out. Nor must we forget that the aspect of many gardens may have changed on numerous occasions even during medieval times, simply because of the growth of the plants, their replacement by others or merely owing to the changing taste of their owners.

On the other hand, the architecture accompanying the gardens, and which was inseparable from them, reaches us almost always in ruins or has been significantly transformed. All of which makes the reconstruction of the gardens frankly difficult, without mentioning the multiple sensations associated with these places. However, the possibility of using the computer to carry out virtual reconstruction provides some insight into certain aspects of the visual perception of these spaces, particularly when we are able to integrate the ruined or modified architecture. Its procedures can never provide a true reconstruction of an object, but do provide an overall impression—the sort of thing we might experience were we to half close our eyes—a general picture, that is, without detail. In our case we shall be able to get the feel of the presence of the mass of vegetation, but without any detail of the varieties planted or their precise location.

This study then, confined to certain examples where sufficient information is available, provides a brief visual analysis of the palace-garden binomium. In order to carry out the work we have followed the methodology which is now becoming standard practice in our research (Almagro *et al.* 2004; Almagro Vidal 2005, 95-190). The methodology we use can be followed through Fig. 1 and can be resumed as: a) survey, b) studies on the hypothesis, c) creation of the geometric model and d) texturizing and lighting (Almagro 2007, "Preserving the architectural heritage...").

The use of information technology to generate virtual reconstructions has become a power motor not only for the dissemination of research but also for analysis leading to a deeper knowledge of architecture. This procedure enables us to recognize the characteristics of architecture reconstructed through immersion within it, and to observe the generated space by means of recreated visual experience. It offers us the possibility of perceptive analysis by simulating a journey through space, and enables us to recognize the sequence of environments, of observing the architecture from different angles chosen at will, of obtaining a bird's eye landscape or view of the reconstructed architecture; i.e., a personal experience of virtual journey through the 3D digital model. In short, it is possible to enjoy and contemplate the architecture of the past by means of an instrument of the future.

Undoubtedly, one of the more consistent features of the al-Andalus palatine model through history has been the paradigm of architecture linked to garden and landscape. The garden is an example of descriptions of the paradises promised to good Moslems in the Koran, and lends life, color, proportion, definition and context to the architecture surrounding it.

As far as we now know, its first manifestations are to be found in the great cross-shaped gardens of oriental tradition, open to the countryside in Madinat al-Zahra' (950-960) (Fig. 2-4), where we also encounter the courtyard arrangement containing within its boundaries flowerbeds and water installations in pools, fountains and irrigation channels. The interior garden solution devised for the Patio de la Alberquilla (c. 955) (Fig. 5) had doubtless served as the model for subsequent garden designs throughout the centuries in al-Andalus.² In the Aljafería (1065-1085) (Fig. 6-7) and the Castillejo de Monteagudo (1147-1165) (Fig. 8-9), as well as in the Patio del Crucero in the Alcázar of Seville (c. 1195) (Fig. 10), also in the Cuarto Real of Santo Domingo in Granada (c. 1270) (Fig. 11-12), or again in the palaces of the Alhambra, the presence of vegetation within the buildings is always evident, although their size and arrangement have evolved over the years. This transformation can be observed and studied in the changes to the paths or walkways which are what have ultimately determined the shape of the plant-bearing flowerbeds and borders. The three longitudinal platforms in the Patio de la Alberquilla can be considered as the design components on which later developments (involving the existence or absence of the cross-defining transverse platform and arrangement for incorporating water) are based. In the Aljafería the linking of water to vegetation is introduced on the south side, and at the same time we can see the play of the transverse walkway heralding the cross arrangement already observed in the great gardens of Madinat al-Zahra'. In the twelfth century the presence of the cross is already apparent in the basic garden design, as is evident in the Castillejo de Monteagudo. In the time of the Almohades, in the Patio del Crucero, this arrangement occurs at a lower level in relation to the halls, and there seems to have been successive subdivisions creating secondary crosses (Almagro 1999, 343). Given the scale of the site, a solution similar to that we assume in Madinat al-Zahra' was adopted in this case. Here the vegetation appears to have been laid out to resemble a kind of grove or wood more in keeping with the scale and function of the whole. At the end of the thirteenth century, during the Nasrid period, the axial paths, both longitudinal and transversal, disappear and are replaced by extensive use of water in large pools or longitudinal channels as in the Generalife (Fig. 13). The vegetation is reduced to long borders flanking the pool, both in the Partal (c. 1305) and in the Patio de Comares (c. 1350) (Orihuela 1996, 57-70, 81-102).

It is extremely interesting to analyze, within this apparently linear evolution, the significance of the Castilian palaces constructed both as a new settlement as well as adapted to existing buildings. There seems to have existed a certain regressive tendency by the use of cruciform designs as is evident in the phase due to Alfonso the 10th of the Patio del Crucero (Fig. 14) which was probably conditioned by the previous arrangement, and the courtyard of the Casa de Contratación (c. 1190) (Fig. 15), although we also find arrangements with a longitudinal pool, such as in the Patio del Yeso (c. 1190) (Fig. 16) (Manzano 2005b, 111-17) and the Patio de las Doncellas (1356-1369) (Fig. 17) (Almagro 2005). In any case, it seems evident that in these Christian artefacts of the fourteenth century there exists greater creativity, thanks to a liberating departure from the more traditional patterns and parameters to be found in Islamic creations proper.

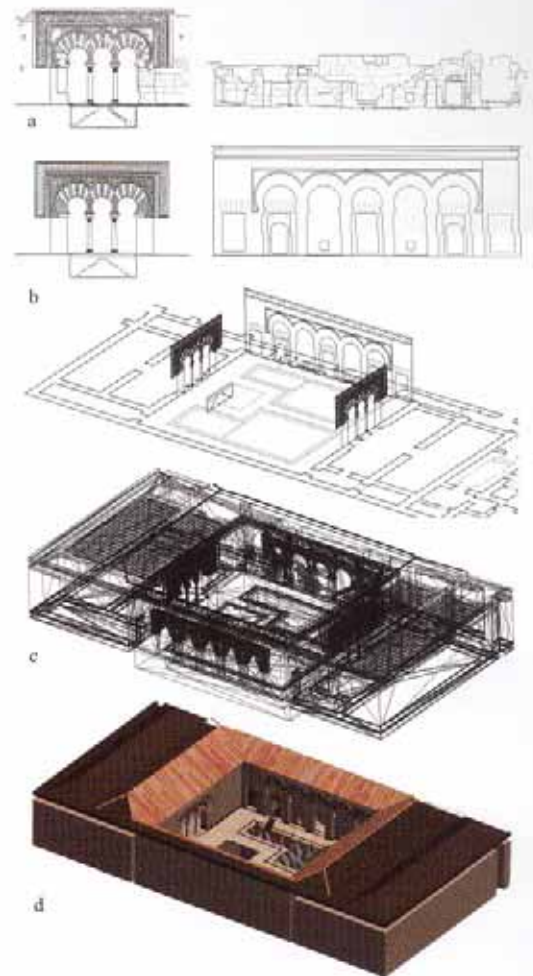


Fig. 1. Methodology for creating a virtual model: (a) Architectural survey, (b) Completion of forms, (c) Creation of the 3D model, and (d) Adding light and textures (Antonio Almagro).



Fig. 2. View of the Central Pavillion from the portico of the Hall of Abd al-Rahman III at Madinat al Zahra' (Hypothesis by Antonio Almagro, image by Miguel González).



Fig. 3. The Central Pavillion in the middle of the Upper Garden at Madinat al-Zahra' (Hypothesis by Antonio Almagro, image by Miguel González).



Fig. 4. The Lower Garden of Madinat al-Zahra with the view-point tower (Hypothesis by Antonio Almagro, image by Miguel González).



Fig. 5. The Patio de la Alberquilla at Madinat al-Zahra' (Hypothesis by Antonio Almagro, image by Miguel González).



Fig. 6. View of the North portico at the Aljafería courtyard (Hypothesis by Ana Almagro, image by Miguel González).

Fig. 7. The South portico and the courtyard from the Northern Hall of the Aljafería (Hypothesis by Ana Almagro, image by Miguel González).





Fig. 8. View of one of the porticoes of the courtyard of the Castillojo de Monteagudo (Hypothesis by Antonio Almagro, image by Miguel González).



Fig. 9. The Courtyard of the Castillojo de Monteagudo from the interior of one of the main halls (Hypothesis by Antonio Almagro, image by Miguel González).



Fig. 10. The Patio del Crucero in the Alcazar of Seville (Hypothesis by Antonio Almagro, image by Miguel González and Ana Almagro).



Fig. 11. View of the garden and the *qubba* of the Cuarto Real de Santo Domingo (Hypothesis by Antonio Almagro and Antonio Orihuela, image by Miguel González).



Fig. 12. The garden and the pool of the Cuarto Real de Santo Domingo from the portico of the *qubba* (Hypothesis by Antonio Almagro and Antonio Orihuela, image by Miguel González).

Fig. 13 The Patio de la Acequia in the Generalife without the Christian transformations (Antonio Almagro).





Fig. 14. The Patio del Crucero in the Alcazar of Seville after the Christian transformation (Hypothesis by Antonio Almagro, image by Miguel González and Ana Almagro).



Fig. 16. The Patio del Yeso in the Alcazar of Seville (Hypothesis by Antonio Almagro, image by Fidel Garrido).



Fig. 15. General view of the courtyard of the Casa de Contratación in Seville after the Christian reform (Hypothesis by Antonio Almagro, image by Miguel González).



Fig. 17. The Patio de las Doncellas of the palace of Pedro I in the Alcazar of Seville without the upper floor added in the sixteenth century (Hypothesis by Antonio Almagro, image by Concepción Rodríguez).

Undoubtedly the Patio de los Leones (c.1370) in the Alhambra should also be considered a result of this greater freedom in design, being a paradigm of an abstract and petrified garden, apparently with the cross-shaped arrangement, but with vegetation which seems to have been confined to a few spaces left specifically for the planting of citrus trees (Nuere 1986). What had been areas of vegetation in another period, here became transformed into ample paved surfaces with channels of water around which movement was possible.



Fig. 14. The Patio del Crucero in the Alcazar of Seville after the Christian transformation (Hypothesis by Antonio Almagro, image by Miguel González and Ana Almagro).



Fig. 16. The Patio del Yeso in the Alcazar of Seville (Hypothesis by Antonio Almagro, image by Fidel Garrido).



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We now have several such examples of garden reconstruction which enables us to put forward a plausible hypothesis regarding their original appearance. For historical context and information about the plans themselves, please turn to the catalog of al-Andalus gardens included on the website www.middleeastgarden.com.

The Gardens and Pavilions of Madinat al-Zahra'

In the lower part of the public area of the palace of al-Zahra' (Almagro 2001, 170-72) there was an extensive plot occupied by gardens circumscribing two halls, that have now been excavated, and a third hall, alleged to exist, but which is still to be investigated, all of which must have constituted the emblematic center of the palatine city. The halls in question are that of Abd al-Rahman III, and, complementing the latter, the Central Pavilion in the middle of the High Terrace garden, and another supposed hall which would have overlooked the so-called lower garden (Manzano 1995a, 316). No doubt these constructions, apart from the strictly architectural, had other symbolic functions, such as providing a fitting frame whose richness and splendor would enhance the legitimacy of the Cordoban caliphate.

Both the Central Pavilion and the front Hall belong to the same architectonic category: that of official reception hall, resembling the hypostyle hall of a mosque deep-set around a clearly discernible central axis. Each of these rooms is preceded by its portico, a hall that opens to the exterior but which in character is closer to the interior space than to the contiguous garden onto which they connect.

Within this set of buildings, we need to focus on the relationship between the Hall of Abd al-Rahman III and the surrounding area which contains the Central Pavilion. The latter, in interrupting our view of the garden axis, creates an impression of a fragmented space dominated by the perspective we have of it from inside the main Hall, the space between the two halls being perceived as an open courtyard in the midst of a lushly planted area. The presence of water casting a practically continuous veil between both buildings only helps to intensify this effect (Fig. 2). This tendency to fragmentation and demarcation of space will be a constant feature of al-Andalus gardens, particularly in those not bounded by a courtyard.

In this instance a play on architectonic symmetry is created, not only through the façades which are observed and interrelate as in a mirror, but also in the reflection of the same façades and of their planes of light on the surface of the water of the pools beneath the four façades of the Central Pavilion. Thus is created a series of spatial dependencies, that conspire to transform the outside space into a space controlled by the view from inside the halls. Similarly, from the Central Pavilion the same effect is produced; however, with the added possibility of seeing the sides and incorporating the surrounding garden into the interior, a duality is created between nature outside and that represented in the rich decoration covering every wall, as if to create an inner paradise within the pavilion itself. So, in its ornamental exuberance and in the design of its construction, this building resembles a summerhouse situated on the walkway of an immense garden in the form of a cross, reminiscent of oriental models (Jiménez 1987, 81-92). To emphasise this character, the Pavilion is situated on a raised platform that has wide walks and pools surrounding it on all sides. This layout brings to mind well-known models from Hellenistic times, at least in the Orient, of palaces or summerhouses set in the center of a lake or pool, usually created artificially.³

It seems apparent that in the Islamic world there are clear paradisiacal connotations to the presence of isolated pavilions in gardens (Koran, 55,72) and the architecture of water developed in Islam makes express reference to these aspects. In Madinat al-Zahra' at least two cases are mentioned regarding exterior areas which are a reflection of the Paradise described in the holy scripture of the Moslems. One would be the Central Pavilion already mentioned, which must have been a small jewel in the middle of really lush vegetation (Fig. 3), which could always be observed from the Rich Hall, as though not wanting to lose sight of either the Pavilion or its content. The other case might have existed at the end of one of the walkways of this enormous garden. It would be easy to imagine that the great central tower on the western side that forms part of the retaining walls of the higher garden that was not for defensive purposes, may have had a small pavilion on the higher part, at the level of the High Terrace. It may have opened out like a lookout point on to the

countryside and the gardens which spread out at its feet (Fig. 4). This layout seems to be a clear precedent of the *qubba* located in a tower, as a palatine category developed in all its splendor in the Nasrid period. This pavilion must have stood out from the lower gardens for its elevated position, as a bower among the vegetation of the garden on the higher level (Jiménez 1987, 81-92; Almagro, Orihuela 1995, 241-42). This tower becomes the point of reference for the whole of this vast garden area, comprising both the lower garden and the Higher Terrace. Its clearly dominant presence over the former may be interpreted as a control point over the surrounding territory (Ruggles 2000, 106-9), embracing not only the lower garden, but also the *hair* or park that extended to the south of the palace area. This function can also be attributed to the majority of the later examples which will follow this category.

The presence of water in this public area of the palace of Madinat al-Zahra' is of fundamental importance, as we have seen, and it is applied in both forms: water in movement and still water. One of the effects that architects endeavored to achieve through the great, still pools, apart from a certain control over the environment, was the reflection of light towards the interior of the halls, thus producing an effect of inverted illumination which was characteristic in al-Andalus palaces. To the contrary, the lively movement of streams is incorporated into the architecture by means of complex arrangements of canals bordering the flower beds, flowing around the gardens and irrigating the flower beds while at the same time the sound of the murmuring water pervades the whole garden. So the sound of running water essentially contributes a complement to the contemplation of the architecture. In contrast, the still, silent water plays the part of a mirror, varying in tone according to the depth of the pool, and offers a dark surface which reflects the clear shapes of fictitious architecture.

The Patio de la Alberquilla at Madinat al-Zahra'

On a terrace situated on a level above that of the gardens previously described is the residence arranged around a courtyard known as Patio de la Alberquilla.⁴ This is a square courtyard with two porticoes along a clearly symmetrical axis and with a central garden whose layout is determined by the orientation of the aforementioned axis (Fig. 5). The rigorous symmetry of the courtyard is broken only by a double flight of stairs communicating with a hall or parallel passageway on an upper level.

This residential ensemble constitutes the origin of and precedent for an archetype that is to reach its greatest expressiveness in the Patio de los Arrayanes (Myrtle Courtyard) in the Alhambra of the fourteenth century (Manzano 1995a, 325). Thus are established the formal components of a type of Andalusí dwelling which in its most sumptuous version is accompanied by the addition of garden and water which incorporates nature into a man-made environment. It consists of double bays formed by elongated halls, with small side rooms as alcoves, facing each other on two opposite sides of the courtyard. One of these rooms is given the shape of a portico or antechamber, as a transitional space linking the hall to the courtyard. This first area has a triple opening divided by richly decorated arches on its outer façade.

The garden within this courtyard also constitutes the first example of a design characteristic of al-Andalus houses and palaces in so far as it includes vegetation. Here the archetype is established for the development of a series of later designs, from the garden around a single axis to the garden of a cruciform design, whose transverse axis is limited to a simple curb dividing up the flower beds. The longitudinal axis is interrupted by the location, at one end, of the pool which has given its present name to the courtyard; it is placed opposite what must have been the main hall of the house. It is an evident precursor of the model of garden that appears in later examples where the vegetation is set out on either side of an axis around a pool set in front of the portico entry to the main hall (in this case, portico-room). In this domestic garden, as in the large outer areas surrounding the grand halls, we are reminded of the play of water on nature: both running water, through the canal system, and still water which delights in reproducing mirror effects. A water tapestry framed by vegetation recreates aspects of Paradise within the domestic atmosphere of the house itself. On this smaller scale we may imagine larger amounts of prairie flowers together with the occasional shrub variety which would not impede enjoyment of a full view of the richly decorated façades of the two halls; all of this being in keeping with clearly

defined architectural parameters that govern the enclosed space on a very different scale to the gardens of the terraces previously described. Although in the future a north-south orientation would normally be given to these dwellings, favoring a sunnier disposition for one of the halls, the characteristics of the plot on which this particular house was sited made an east-west orientation unavoidable. So, the dazzling morning sun would fill the interior of the hall orientated towards the east, at the same time as it reflected its image on the surface of the pool.

The Aljafería in Zaragoza

In the Aljafería of Zaragoza (Beltrán 1998; Ewert 1987), apart from possible side areas of the palace gardens about which we lack any accurate information, the inner courtyard forms a link in the chain of development of al-Andalus courtyard gardens. In this eleventh-century palace there is an attempt to imitate the buildings in Madinat al-Zahra' through visual and symbolic artifices expressed and enhanced in the decoration, given the impossibility of reproducing the scale and magnificence of the architecture of the Cordoban Caliphs (Ewert 1973, 72-73; Almagro Vidal 2005, 243-75). These buildings are reminiscent of the great gardens and protocol halls of the Patio de la Alberquilla.

In this instance the most outstanding feature is the replication of a pool, albeit asymmetric, in front of each of the porticoes. They are dissimilar and must have been designed to produce different effects on the building. The northern pool, which is larger and more shallow, must have been planned as a static surface, and conceived primarily as a mirror to reflect the best lit façade. It functioned as a mirror reflecting the inverted image of the northern portico, as well as providing indirect and changing illumination with the sun's movement of the hall where official receptions were held. The pool was surrounded by a U-shaped portico over the main walkways of the palace (Fig. 6).

The layout of the pool at the north end is similar to the large pools in front of the Hall of Abd al-Rahman III and the Central Pavilion in the garden at al-Zahra', and was an attempt to reproduce the splendor of the architecture of the caliphs through evocation and detail, without the elements of size and splendor of those buildings. The pool on the southern side, however, has different features, being at once smaller and deeper. It is quite possible that water from a fountain may have reached it along a channel which was located in the widening of the central platform, which may have been the beginning of a transept. The water which would thus flow into the pool would cause the surface to ripple, creating a trembling effect on the reflection of the southern portico, which, owing to its orientation, would never receive direct sunlight. The rather unvarying and monotonous lighting of this side of the courtyard would be enriched by the effect of the vibrating water. There is no doubt that the layout of the southern pool reproduces the design of the Patio de la Alberquilla at Madinat al-Zahra' in that it imitates its position embraced by the accompanying vegetation that converts the courtyard into a garden of reasonable dimensions and was probably surrounded by a myriad of color in harmony with the decoration of the porticoes and halls. The garden would serve as a carpet or screen of vegetation at eye level visible from inside the halls (Fig. 7).

One visual feature not without relevance has to do with the disparity in depth of the two pools which would give rise to different hues and different degrees of transparency of the water, adding subtlety to the generation of virtual spaces produced by reflecting the real shapes of the courtyard on the surface. There would be additional effects due to the shadow of the portico and its columns on the marble paving, to the reflection of light on the marble, and to the dynamic spatial effect created by successive porticoes, itself heightened by the effect of the intertwining of the decorative arches, reminiscent of the projection in depth of a space on the façade. The poly-lobuled profile of the arches and the slenderness of the columns on the paving, and the alternating light and shade on the walls would give additional depth to the spaces. By giving the impression of a greater number of vertical planes, we can assume that the layout of the garden vegetation would help to produce a similar effect.

The Castillejo of Monteagudo

In the inner courtyard of the Castillejo de Monteagudo, the Qasr Ibn Sa'd of the King of Murcia Ibn Mardanix (Navarro,

Jiménez 1995), there is yet another step forward in the evolution of these garden spaces linked to al-Andalus palatine architecture. The arrangement of two dissimilar pools in the Aljafería gives way to a layout of double symmetry, with two pools alike opposite the porticoes and cruciform walks, creating four identical flower beds. This is where we find the first example of totally symmetrical arrangement, both regarding the main halls and the garden, in what can be considered an improvement as regards to the Patio de la Alberquilla and the Aljafería, where the symmetry of the architecture is not accompanied by symmetry in the garden. In this instance there is a perfectly achieved balance, with a clear transversal axis delineated by the perpendicular walk of the cross shape.

From what we can see from the surviving remains, access to the palace seems to have been from one of the angles, and entry into the courtyard in the center of the longer side was through a side corridor. From here a peripheral route towards the halls could be followed along the side walks or in the direction of the center of the courtyard along the walk of the crosspiece. The double symmetrical axis is highlighted by the fact that access to the courtyard is precisely by means of the transversal axis. Additionally, this transversal axis takes on a specially prominent role because of being wider than the longitudinal one, since it was also used to communicate the lateral bay of the north-eastern side with the access. It can be said that, together with the appearance of the double symmetry, there is a degeneration in the axial movement which is interrupted by the pools; this accentuates the difference with the character of the oriental Islamic palaces with their "processional" axle walkways and oblique walkways. It may be pointed out that this tendency would reach its maximum in the Patio de los Leones in the Alhambra.

As the central axis of the courtyard is broken up by the pools, the access walkways to the halls are set out across the two lateral walks (Fig. 8), therefore rendering any form of processional walk impossible, just as in the Aljafería and previously in the Patio de la Alberquilla. The spatial progression which might lead to the reception halls through the main axis is interrupted by the pools (Fig. 9) in the typical way of al-Andalus palatine architecture, in which the paths to the halls give access from the sides and never through the axis of the courtyard. In this way circulation is entirely by means of the perimeter, leaving the central area for walking and enjoyment of the garden, and not necessarily offering access to any given place. This may be considered the prelude to the gradual disappearance of the pathway through the main axis which will in time be replaced by a stretch of water.

The obvious symmetry of this garden with its two crossed axes defining four sunken areas for vegetation establishes the model of later characteristic examples of gardens and cruciform courtyards, particularly in the Almohade period and later in Nasrid times. The Generalife and more especially the Patio de los Leones in the Alhambra are examples of the latter. This tendency could be interpreted as an attempt to idealize the garden area by submitting it to the strictest norms and guidelines of composition, maybe in search of a representation of paradise. In this courtyard, the presence of water is restricted to the two pools located in the extremes of the courtyard, opposite the porticoes giving access to the halls, in this way creating the habitual play of symmetry of fictitious architecture produced through reflection, as in the examples analyzed previously.

It is worth focusing on the layout of the halls of this residence because of their open character, particularly along their façade, with the result that they resemble garden pavilions rather than rooms of a residence. Apart from the broad bays which communicate the porticoes with the halls, these are more diaphanous due to the lack of alcoves, therefore giving greater importance to the portico which appears larger in relation to the hall. Taking into account the fact that the residential areas seem to have been arranged around four small courtyards located in the corners of the building, and that in any case Monteagudo must have been basically intended as a place for recreation and pleasure, it should be no surprise to find this open relation between garden and hall. This is also emphasized by the arrangement of the small rooms inside the central towers, which must have been watch places overlooking the surroundings. This layout of portico, hall and observatory leads up to the most well-known creations of the Nasrid period, such as the Generalife, the Partal, and to a certain extent the Palacio de Comares itself and the Mirador de Lindaraja in the Palacio de los Leones.

Several effects are achieved with this layout. In the first place a greater sense of depth of the space, which

seems to have been continually sought since the protocol halls of the type of Madinat al-Zahra' were abandoned. Secondly, a double relation is created towards the interior and the garden, a space which is controlled and restricted, and towards the outer surroundings where the dominant position of the building and the observation tower itself gives a feeling of territorial dominance. Furthermore, if, as we may suppose, the ruler were seated in this tower, his position against the light and in an area of shade would give him visual advantage over whoever entered into the hall, dazzled by the contrast of light between the courtyard and inner area, emphasized even more by the light and shade from the arched windows of the tower behind him.

There seems to be every indication that this palace formed part of a large agricultural and recreational complex, protected under the impressive size of the Castillo de Monteagudo and watched over by the small watch-towers of the Castillejo from where its owner could enjoy the orchards which spread out at his feet (Navarro, Jiménez 1995, 95-96). This vast agricultural estate had, among other things, a huge reservoir which provided sufficient water supply for irrigating the surrounding orchards and at the same time an area for recreation thanks to its coolness. In the neighborhood there probably existed some small pavilion similar to those of the Buhaira of Seville (Manzano 1995a, 339-340; Amores 1995) or the grand Almohade estates of Marrakech (Marçais 1954, 404-5; El Faïz 1996, 5-16). This simultaneous possession of country residences within agricultural estates undoubtedly originates from the types which existed in the first centuries of Islam and which spread throughout the whole area of their domain. In spite of its short life, the development of Monteagudo was undoubtedly one of the most significant in al-Andalus.

The Patio del Crucero in the Alcazar of Seville

This architectural development which is partially conserved in the Palace of Seville must have represented the principal residence of the Almohade caliphs in the al-Andalus capital (Almagro 1999, 332-44). Together with the first phase of the Patio of the Casa de Contratación, they represent the best existing examples of Almohade palatine architecture. The Islamic taste for controlled space manifests in this case—in spite of the enormous size—a courtyard and garden simultaneously set out at a different level while at the same time integrated into just one site (Almagro Vidal 2005, 295-320).

An intrinsic part of the spatial concept of a courtyard is the architectural definition of its limits by means of walls which are completely blank or perforated with small holes, or also by means of walls which at the same time serve as highly decorative architectural panels (Fig. 10). Therefore it can be concluded that the courtyard defines its spatial condition through the use of formal and constructive features characteristic of the architecture. In a garden, however, space is defined through the vegetation, almost always aided by water as a feature of composition that defines and encourages the creation of living architecture which relates it with Paradise, since it is the fertile land that defines the plan of the soil. But in this case which concerns us, and this is its peculiarity, we can observe a certain symbiosis of the two spatial concepts, due to the overall composition of the architectural area.

On the one hand there is the enormous size of the development. The precincts measure 47.40 x 34.40 meters, which means that it is the largest known courtyard in al-Andalus. This affects both the use and way of arranging all the features defining this space of such huge dimensions, but which nevertheless attempts, above all, to conserve its essential character as inner and an intimate space typical of any Moslem residence. The use of architectural features fitting to this immense scale must have been one of the main challenges for the constructor of this palace, although this can only be deduced from the infrastructure on the lower level.

A similar appreciation can be made in the case of the use of the vegetation as an integral part of the whole courtyard. The dimensions of this area necessarily imply the use of trees to achieve the required balance in composition in general, since the scale used would need a certain size (about 4.00 meters in height). The important characteristic of this precinct is the fact that the level of the garden was sunken 4.70 meters with respect to the main level of the halls. This peculiarity of double level offers a great visual richness to the area, since the four bays which comprise the living area of the palace communicate only through the visual axes. The fact that these axes are not passable at the height of the palace

converts the fictitious level of the courtyard ground into an element of separation of two areas, each of them defined by its own spatial characteristics.

Moreover, this level would be marked out and defined by the encircling of the tree tops which would create a green carpet. In this way, the spatial perception of the courtyard defined by this carpet of vegetation and of the inner space of the halls, seen in the direction of the central visual axis, advances as the spectator approaches the portico, transforming what was initially perceived as an opaque area of vegetation set out horizontally, into an illusion; so another inferior spatial reality was appearing in front of us, juxtaposed to that of the palace itself. The impossibility of accessing the porticoes from their front axis, because of the lack of a raised path at the same level in Islamic times, made it necessary to do so by means of the lateral walks of the courtyard, which are the link in communication between the two main bays.

The existence of what might be called sunken garden-space opposite the courtyard-space on the palace level, makes it possible to establish a separation in area between the rooms and protocol halls, and the area of development, rest and recreation. If the substantial component in the garden area is vegetation, in the higher level it is the emptiness, with opposing values of transparency and opaqueness respectively in each context. While the level of the palace is laid out around this void and all the paths are around the perimeter, at the same time as the views converge towards the central space, the sunken level maintains these perimeter walks, while it also reinforces the axial paths. The inclination of the Islamic mentality to preserve privacy and hide away from spying eyes, would have as an ally the lush vegetation of the garden, which filters and introduces different screens of opaqueness. The peculiarity that the central axis of the courtyard is not a physical path which is possible on either the higher level or, presumably, on the lower one, establishes a new reference for later Nasrid periods and distinguishes it, on the other hand, from previous examples where there were axial walkways which could be used.

Over and above everything explained, it is possible to appreciate a relation of clearly established domain of the area that defines the palace courtyard over that of the garden, due to its elevated position of control. What happened in the High Terrace of Madinat al-Zahra', where nature and architecture merge together on the same level, no longer occurs. Here, in the Palace of Seville, it is the architecture which takes on the dominant position.

Courtyard of the Casa de Contratación

This courtyard, which belongs to one of the several residences within the Almohade palace of Seville, corresponds to the archetype of an al-Andalus courtyard, with double symmetry and opposite halls with porticoes and pools in front of them, exactly as was defined in the Castillejo de Monteagudo. Although only some parts of the Almohade building are recognizable, due to later transformations, it is possible to identify it as a quadripartite courtyard with remarkably deep flower beds, but not to such an extent as in the Patio del Crucero (Fig. 18). The only anomaly observed in that case is the

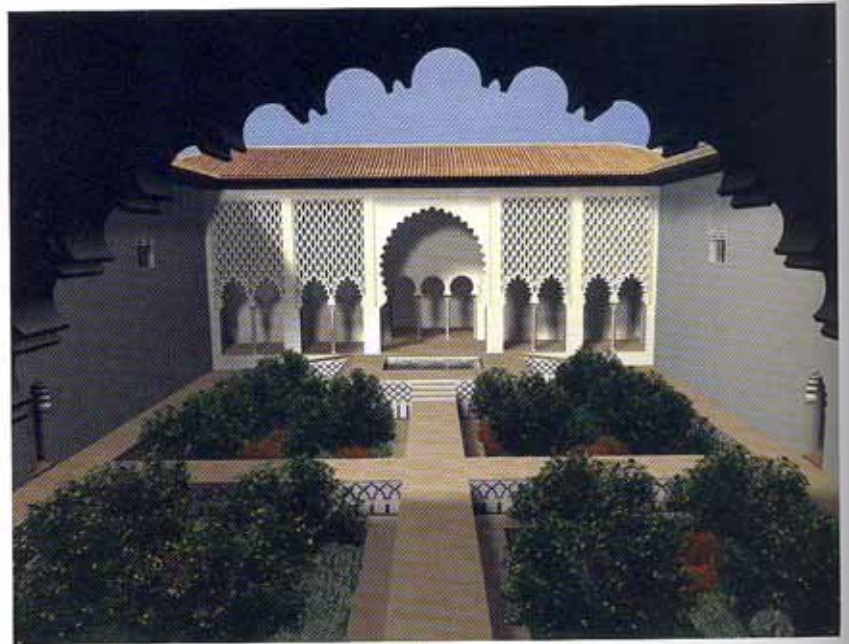


Fig. 18. The Almohade courtyard of the Casa de Contratación in Seville from the inside of the South portico (Hypothesis by Antonio Almagro, image by Miguel González).

slight difference in level between the north and south sides, which is visible because of the existence of ramps on the lateral walks to go up to the level of the porch and northern hall.⁶

In this case, remains of the decorative motifs have been conserved, which were used to simulate architectural features on the walls bordering the flower beds, something which may have been habitual in the majority of the gardens we have seen. This way of integrating the architecture into the garden is a straightforward attempt to imitate present day solutions in other cases. So, the whole perimeter of the garden in the Patio del Crucero had porticoes to seek refuge from the rain or from excessive heat. In later examples, from the fourteenth century, the series of simulated arches changes from being painted to the use of bricks, both in this courtyard and in others.



Fig. 19. The Almohade courtyard of the Casa de Contratación in Seville from the south-west corner (Hypothesis by Antonio Almagro, image by Miguel González).

The portico on the north side could be reconstructed thanks to fragments which came to light with the demolition of the Casa de la Contratación (Manzano 1995b, 122). It was a huge construction based on a large central arch flanked on either side by two panels of openwork arabesques, each of which stems from double arches with a central column (Fig. 19). This arrangement, derived from the perfecting of previous forms, demonstrates the lack of tectonic value of the decorated panels which here become stretches of hanging ornamental panel—more similar to a textile than a constructive feature. Their formal features create a rich composition in which there is a combination of stylized floral shapes together with other mixed line geometrical forms on a screen which seems to reproduce images of a mineral garden imitating the leaves of a tree which allow the light to filter through and create a decorative effect of considerable movement. This open geometric design of the arabesque, which makes up the lattice panels of Almohade art, is projected on the walls and floors of the porticoed area. It creates the illusion and vitality of additional levels of decoration through the continuous effects of light and shade, transparency and opaqueness; and varies throughout the day which provides a continuous transformation of this area, the ante-hall of the closed inner hall that is kept for receptions and resting.

The Cuarto Real de Santo Domingo de Granada (Royal Hall of Santo Domingo, Granada)

El Cuarto Real de Santo Domingo is representative of a garden with pavilion built at the beginning of the Nasrid period (Orihuela 1996; Almagro and Orihuela 1995; 1997). It corresponds perfectly to the model of garden which forms part of a larger property that would normally include orchards under cultivation and other houses or buildings. However, the main core of the ensemble consists of a garden enclosed by walls and a building intended to shelter the owner, for temporary use, but not as a customary dwelling (Fig. 11). Apart from some contemporary buildings, such as the Alcázar Genil in Granada, the Partal, or the Generalife itself, the nearest parallel building we can find to this ensemble is the pavilion allegedly located in the western tower of the precincts of the Terraza Alta de Madinat al-Zahra', which must also have had

a view enjoying the lower gardens. The Cuarto Real reproduces exactly the same plan because the pavilion, consisting of a *qubba* with alcoves and storerooms along the sides, is located inside a solid tower of the city walls and from inside it overlooks both the enclosed garden, which the hall opens onto, and the orchards which extend outside the walls to the banks of the River Genil on a much lower level, and which could be contemplated through the windows.

The enclosing wall in this garden takes on an important role, since it serves as a feature of construction aimed at preserving the privacy and security of the confines, after which the Moslems always sought. On the other hand, its function is to define the physical limits of the grounds to be occupied by the vegetation designed specifically for pleasure and enjoyment, since both garden and pavilion were surrounded by areas of orchard and auxiliary buildings which did not in any way form an architectural unit. Therefore we are not dealing with a garden within a courtyard, but with a garden enclosed by walls and with a pavilion on one of its sides.

This garden has an obvious axis of direction and composition in the outside area defined by a pathway, the pool, and the axis of the portico in front of the pavilion and by means of which there is communication between the pavilion and the garden in a straightforward and continuous way. Once inside the garden, the *qubba* becomes the center of attraction because of the verticality of its volume, which is also manifest from inside because of its proportions and trough-like roofing. The garden has a simple layout, with two long flower borders separated by the walkway which follows the direction of the axis and surrounded by other walkways along the sides next to the walls encircling the grounds. The shallow depth of soil for cultivation implies that the garden was mainly planted with varieties of prairie flowers, although there may have also been trees and bushes along both borders. So we have to imagine a garden with a spacious atmosphere, maybe with myrtle hedges along the central walkway, large areas of meadow and flowers and trees in the areas nearest to the lateral walkways. All of this would leave a clear perspective of the pavilion from the garden, and especially along its axis, in such a way as to establish clearly both the usefulness and the symbolic function of this building which presided over the whole ensemble.

In this case, the originally defensive tower is transformed into a summerhouse in the garden and the inner hall is adorned and covered with rich wooden roofing and linked to side rooms used as rest rooms related to the use of the pavilion for pleasure. The fact that the portico was an area of transition between the garden and the interior is important: this diaphragm space would regulate the walkway towards the interior by concentrating attention on the center of the hall, which was only visible through the one access arch.

Another outstanding feature in the Cuarto Real de Santo Domingo is the intermingling of water and architecture, which marks the beginning of its extensive use in Nasrid architecture, where it will take on a role of maximum importance in the courtyards and gardens. The octagonal pool located at the far end of the central pathway of the garden was supplied from a fountain in the center of the portico, so the water would flow from inside the building to the outer area where the pool was located (Fig. 12). This implies, to a certain extent, manipulation of the water, the same as happens with the vegetation that was incorporated by means of decoration. This conspiracy to manipulate will reach its peak a century later in the Courtyard of the Lions in the Alhambra; this instance of the *qubba* of the Cuarto Real de Santo Domingo was an eloquent forerunner to the architecture developed one century later.

The Patio de los Abencerrajes (The Courtyard of the Abencerrajes) (c. 1300)

Within the precincts of the Alhambra there are several surviving palaces with courtyard gardens, and in some instances they have outer areas with gardens and orchards that maintain their essential character and a certain resemblance to their original forms, in spite of some transformations across time. We are going to restrict our analysis of some Nasrid palaces to one case in which the virtual reconstruction offers interesting information. We shall analyze the Palacio de los Abencerrajes, a sumptuous residence built at the beginning of the fourteenth century, located on the south side of the precincts which underwent destruction beginning in the eighteenth century. The excavations carried out there have enabled us to define with precision the plan, and in particular, the layout of the garden which existed in the courtyard

(Orihuela 1996, 49-56). This turns out to be particularly interesting because it establishes the change at the beginning of the Nasrid period, according to which the pools become larger and larger and reach the point where they take up the whole of the main axis of the courtyard.⁸

In this example the pool assumes maximum importance in the courtyard, and even occupies a third of the surface area not set aside for walkways (Fig. 20). On both sides borders were laid out, taking up a similar surface to that of the pool, and separated from it by narrow walks which were not designed to give access to the main halls, since they came practically up to the pillars of the porticoes. The access paths therefore ran around the outer perimeter of the courtyard, and in fact all axial movement ceased. In spite of the lack of existence of a transversal axis in the layout of the garden, we cannot eliminate

the presence of a *qubba* inside one of the towers of the walled precincts, which would give a view to the outer areas, in accordance with the patterns already seen in examples such as the Cuarto Real de Santo Domingo.

This way of laying out the courtyard and its garden will be even more significant in the Patio de la Alberca (Courtyard of the Pool) or the Courtyard of the Myrtles in the Comares Palace, where the area set aside for vegetation is restricted to two long, narrow strips filled with myrtle hedges and arranged on either side of the pool, which therefore become the central feature of the area. It seems that in this latter case there never existed any vegetation other than the myrtle hedges. In the Palacio de los Abencerrajes, the greater size of the garden area leads us to believe that together with the myrtle hedges and beds with flowers, there must also have been some trees. The importance of the water in the courtyard enhances the reflections of the architecture on the surface of the pool, something which was manifestly noticeable in the Comares Palace. The projection of the porticoes, which are in front of the main halls, onto the pool's surface highlights the virtual character of the architecture which in this example still had brick pillars in the Almohade architectural tradition.

We can observe similar effects in other buildings of this period and later. Above all, cases like those of the Partal Palace should be brought to attention, where water appears almost exclusively and we cannot count on the presence of any vegetation—at least in the area closest to the portico and to the northern pavilion—or in the Palace of Yusuf III, where water and garden still maintain a balanced arrangement. At any rate, the total disappearance of the axial pathway throughout the length of the main axis becomes a constant feature in both the palatine and domestic Nasrid courtyards and gardens.⁹ We can appreciate the same characteristic—although with some differences—in the other pattern of Nasrid garden-courtyard that we cannot deal with here.

I hope to have shown in this study the multiple possibilities offered by computer-generated images in this field. Visualization of disappeared architectonic or landscape elements is, without a doubt, of great attraction to the non-specialist public, but it is also a very powerful instrument for research itself. In this case, we have tried to take advantage of the possibilities brought forward by the visual analysis of spaces, shapes, and even colors to understand some of the

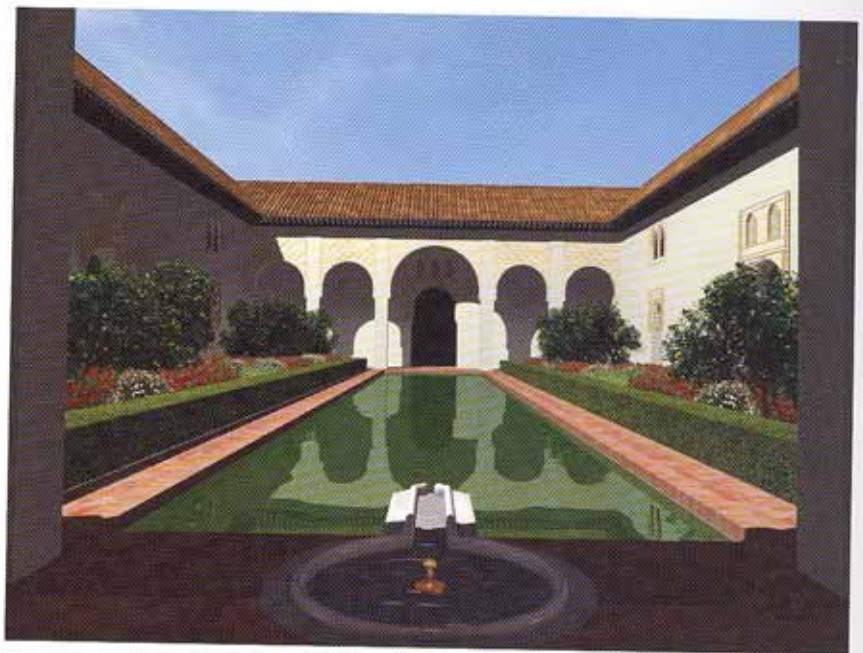


Fig. 20. View of the courtyard of the palace of the Abencerrajes in the Alhambra (Hypothesis by Antonio Orihuela, image by Miguel González).

original ideas underlying artistic creations. In the future we should improve this instrument by developing the important aspect of the representation of vegetal species, taking into account opinions from botanic specialists and text analysts working on testimonies from that time. We think this is only the beginning of what could be a very fructuous course.

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Notes

¹ The images included in this article have been produced, according to the hypothesis of the author, by Miguel González, Ana Almagro Vidal, Concepcion Rodríguez and Fidel Garrido. The hypothesis of Fig. 5 and Fig. 6 is by Ana Almagro Vidal. The hypothesis of Fig. 14 is by A. Orihuela.

² In Madinat al-Zahra itself, we must not forget a minimum scale replica of the latter situated next to the mosque. See Almagro 2004, 121-22.

³ We should remember the cases of the Palace of Iraq el-Emir in Jordan (Wild and Larché 1991), or the garden with a lake pavilion in Petra (Bedal 2003). Although we are dealing with a different scale, we could also consider some of the constructions of Villa Adriana in Tivoli. Of a later date, la Favara, near Palermo, also follows this same model (Marçais 1954, 120; Zangheri, Lorenzi, Rahmati 2006, 213-24).

⁴ A complete planimetry of this building can be seen in Almagro 1996, 222-27.

⁵ To mention just one example, we can cite the case of Qasr al-Hallabat in Jordan, whose fortified residence is located on a mountain and has an area under cultivation perfectly limited within the region (Bisheh 1985).

⁶ Here we follow the new explanation given to this area and its successive transformations, which can be studied in greater detail in Almagro 2007, "Una nueva interpretación...".

⁷ We are referring mainly to the Patio de Comares, Patio de los Leones, Palacio del Partal and Generalife (Orihuela 1996, 81-102, 103-14; 57-70; 199-220).

⁸ This development seems to have commenced in the so-called proto-Nasrid period, which would be represented by the second phase of the Qasr al-Sagir of Murcia (Navarro 2005; Pozo 1999), corresponding to the time of ibn-Hud (first half of the thirteenth century).

⁹ We can cite the house of Zafra, the houses of the Chapiz or the one in the Calle Real in the Alhambra as examples (Orihuela 1996, 281-94, 305-14, 175-80).