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Restoration of al-Ashrafiyya Mosque and Madrasa Ta'izz - Yemen

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Restoration of al-Ashrafiyya Mosque and Madrasa Ta'izz - Yemen

2008-2014



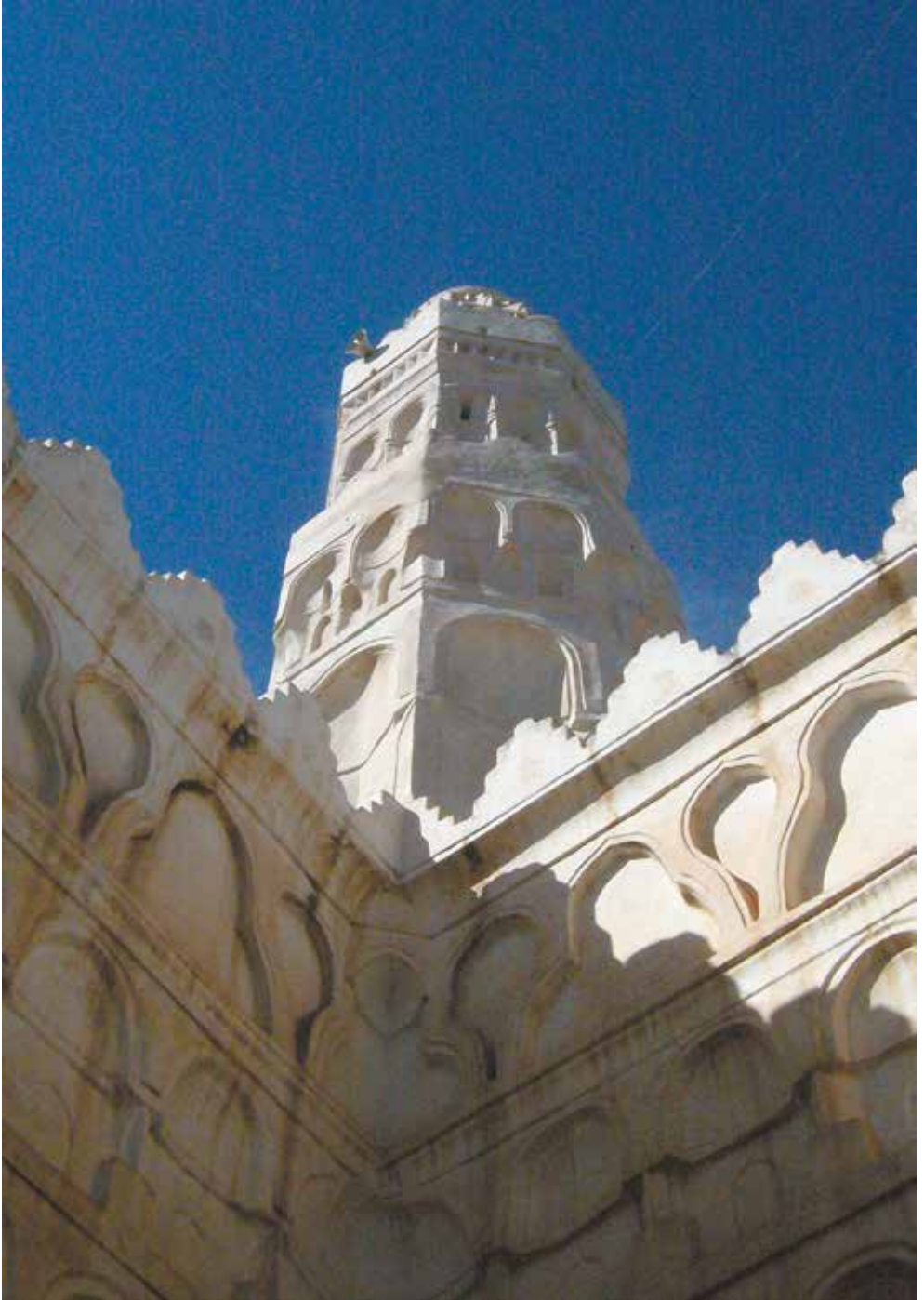


**Social Fund
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**Istituto Veneto
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Italy**

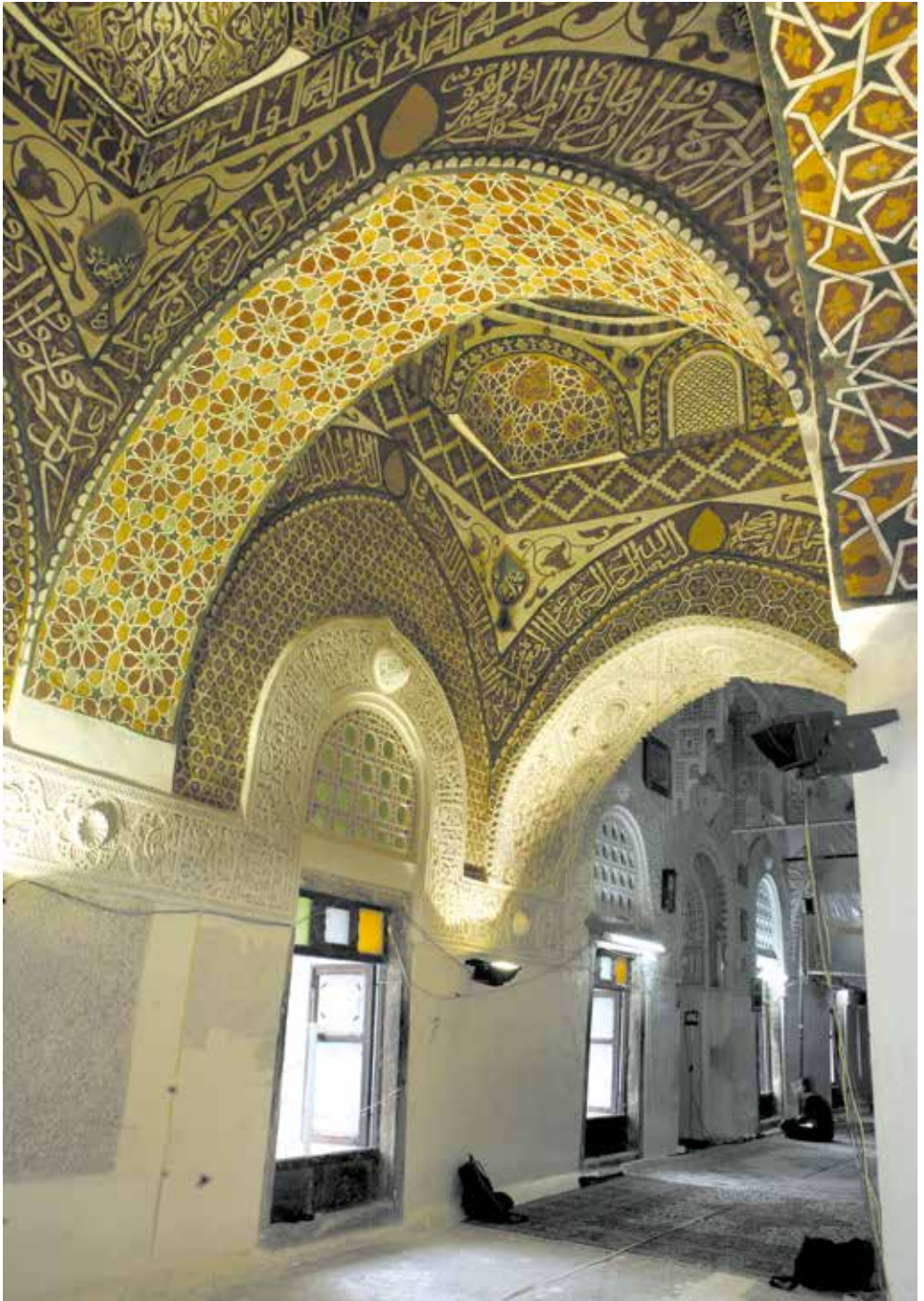
**Italian-Yemeni Centre
for the Conservation
of Cultural Heritage
Sana'a**

Al-Ashrafiyya Mosque, one minor dome



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A contribution to the social and cultural growth of Yemen

The restoration of al-Ashrafiyya Mosque and Madrasa in Taizz is part of a process of discovery and enhancement of the historical-artistic heritage of Yemen, a country rich in traditions and culture.

Taizz, the ancient capital of the country, has been designated as cultural capital of Yemen since 2013, being one of the oldest cities in Yemen and acknowledgedly active in the cultural production of the country. Taizz preserves rare jewels of Rasulid architecture, among them is the Mosque and Madrasa of al-Ashrafiyya. After eight years of restoration works the mosque is given back to the community.

Many are the objectives achieved by this all-round intervention of restoration. First of all, the restoration and conservation of one of the oldest monuments of the city, as through its recovery new generations will learn about their past and feel it more closer to them.

Only by the mean of knowledge and

Al-Ashrafiyya Mosque, internal view

appropriation of the past mankind can look to the future with greater awareness. The restoration has also allowed us to activate a training program related to conservation for local young male and female yemenis, which led to the creation of new jobs and the formation of a generation of high skilled craftsmen at international standards.

A more general result therefore includes a contribution to the social and cultural growth of the country, as well as the economy of the city. We thank all those who have participated in this work, which output is the product of a collective effort. The result has been achieved thanks to all, who worked with passion and dedication over the years, learning to know and appreciate the traditional building techniques and rediscovering a glorious and fruitful past. We hope that in the near future new conservation programs can be activated, as a need of a community who wants to regain possession of its monuments. And we also hope that the social and political conditions will allow this dream to come true, because only in an atmosphere of peace there can be development, growth and welfare.

Historical background

Al-Ashrafiyya Mosque and *Madrasa* is located on the slopes of Saber Mountain, in a dominant position which offers a very panoramic view of the whole city of Ta'izz.

The Mosque was built at the end of the fourteenth century (the most authoritative sources indicate the year as 1397/800 HJ, according to the hejira calendar) by the will of King al-Ashraf Ismail II, the seventh heir of the Rasulid dynasty which ruled for more than two centuries from Hadramawt to Mecca, placing their capital in Ta'izz.

Al-Ashrafiyya is both a mosque and a *madrasa*, meaning that it was, at the same time a place of worship and a school which hosted classrooms and dormitories for students and teachers. In the courtyard stand some rich tombs, beautifully decorated, that belong to important members of the Rasulid royal family. Among these, one of al-Ashraf himself and his son al-Nasser Ahmad, the eighth king of the dynasty, and his grandson al-Mansour Abdullah son of Ahmed (these information has been published for the first time after the discovery during





the fine restoration of this tomb). The Eastern royal graveyard has been discovered in the basement during the archaeological excavations and reopened for the public along with some findings including large number of manuscripts in the recessed cupboards in the toms.

The building has two twin minarets, which represent the power of the ruling lineage, which is rather unique for the tradition of that period.

Over time, the structure has not undergone significant changes compared to the original unit, the one on the North, which includes the longitudinal prayer hall and its courtyard access.

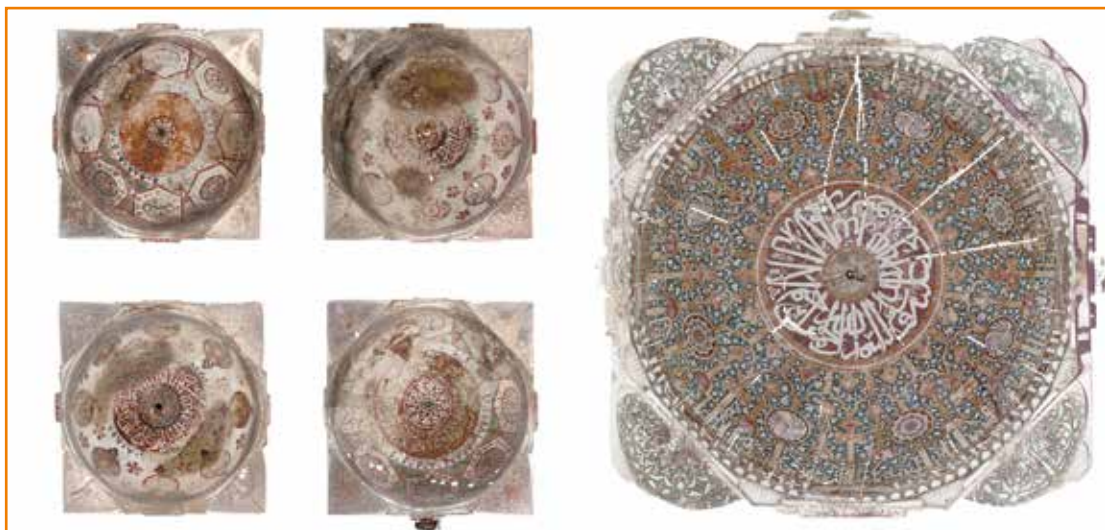
The prayer hall is a rectangular room, adorned with abundant and elegant mural paintings and rich decorated stuccoes, and is mounted by nine domes: the great dome at the centre divides the smaller ones, four on the West and four on the East.

The comprehensive restoration project of the whole complex, requested by the Social Fund for Development, was elaborated between 2003 and 2004 and implementation started in 2005.

The following year, the Istituto Veneto per i Beni Culturali (IVBC) was en-



trusted with the management of the restoration of the historical and artistic artifacts, namely the wall decorations, the archaeological wooden elements and stone works. An intervention program was included for training of the local workforce, under the direction of IVBC's teachers and experts. The main goal of all involved in the project was to appraise the immense heritage of Yemen and enhance citizen awareness of the priceless value of the works throughout in their territory that are testament to a great past. The Istituto Veneto hopes to continue in the direction taken more than forty years ago by Pier Paolo Pasolini, who in 1971 addressed an invocation to the UNESCO, to help, "Yemen to be aware of its identity and value".

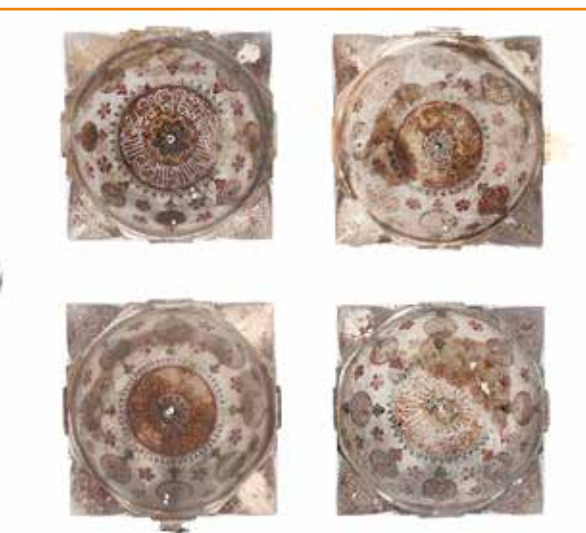




The intervention program of the historical and artistic artifacts

At the med of 2008, a training course and the construction site were initiated. Then, in 2010, a carpentry workshop was integrated into the program. Lectures and follow-up workshops, alternated with significant practical experience in the al-Ashrafiyya site, under the supervision of the IVC's experts, allowed the Yemeni technicians team to specialize in different restoration areas. The team demonstrated a high capacity to work with proficiency, reaching great levels of expertise.

In the present analysis, some of the most exemplary works that the Istituto carried out are depicted.



The mural painting and the stuccoes decoration in the Prayer Hall

The main dome

The prayer hall is a long rectangular base structure (25 meters by 7.60 meters) divided into two aisles by arches resting on octagonal pillars. In the middle of the hall, as mentioned above, is the big decorated dome, 15 meters height, which dominates the space above the *Mihrab*, a niche that indicates the direction of Mecca. On both the East and West side, two large pillars support the archway soffits of the barrel vaults, adorned with carved stucco geometries. The *Mihrab* is also framed by a frieze with Quranic verse inscriptions in *Thuluth* calligraphy and is surmounted by a projecting cornice - drilled shrine shape - on which three small caps are placed, dominated by gypsum ovoid cusps. The *qadad*, a fine mortar based on lime traditionally used in Yemeni architecture, whitewash daubs the walls of the hall up to a man's height and ends in a stucco strip decorated with *Thuluth* calligraphy, which relates Quranic verses and meanders along the perimeter,



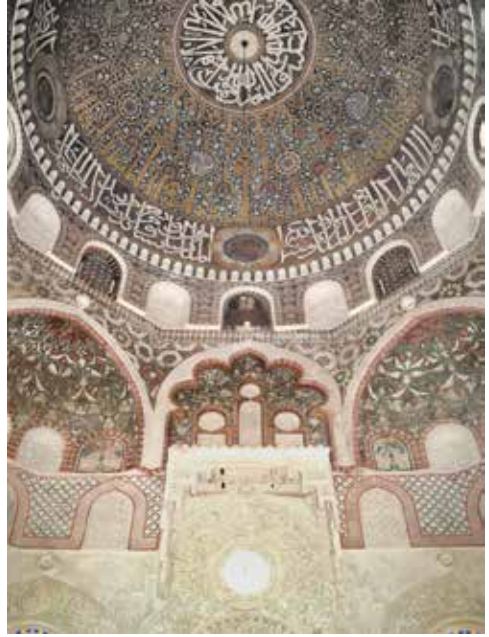


marking the limit of the first register. The area above forms the second register, denominated “niches level” in which projecting arched niches with pointed arches open up intermingled by simulated lancet windows five-lobed shaped, each one also containing false stucco windows. The wall surfaces are coated with delicate symmetrical stylized floral decorations. The next register is the octagonal drum, which is articulated by four arc-shaped windows.

These openings let the natural light flood into the hall and magnify the wall decoration in its entire splendor. The spacing between windows is painted with *arris* in which a dense series of flowers, cleverly contrasted, animate a rich play of colors. On the drum, which ends in a notched annulus rough projecting, rises the hemispherical dome, harmoniously painted with three concentric ascending modules.

The first consists of a large calligraphic strip, which stands out on a red and blue floral carpet and is interrupted by large purple rosettes in the four cardinal points. Another circular calligraphic *Thuluth* band, again on a floral carpet, with the *Basmala* (the invocation to God) and





The central dome (left), the northern wall (above) and the eastern wall (under) before and after the restoration



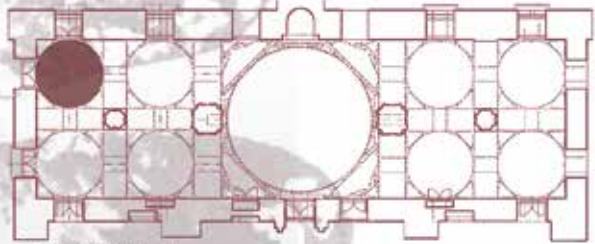
the *Shahada* (the profession of faith), identifies the summit, that is completed by a projecting stucco rosette. In the middle, a symbolic structure stands out that recalls the shape of a pergola with branches, painted in orpiment to recall the preciousness of gold, and which is based on Kufic inscription. With a deep blue sky as its background, a lively spiral twists with red and white vegetal elements.

The eight minor domes

To the east and the west of the main dome, extend the lateral aisles, composed of two bodies, each covered by four minor domes that are 7 meters high that present an extended mural painting, set on two types of decoration. The first one has round motifs recalling the shape of a pomegranate, that are spaced out by red five-petalled flowers, symbols of the Rasulid dynasty; the second has eight hexagons, including a four-pointed stars. Both are arranged between bands with Quranic inscriptions. Under the pendentive, diamond drawings or other inscriptions in *Kufic* calligraphy can be found with arches as well are crossed by Quranic verse strips.



SECTOR A



before

work phases

dome



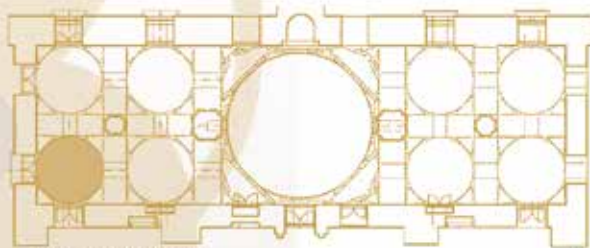
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walls



SECTOR B



before

work phases

dome



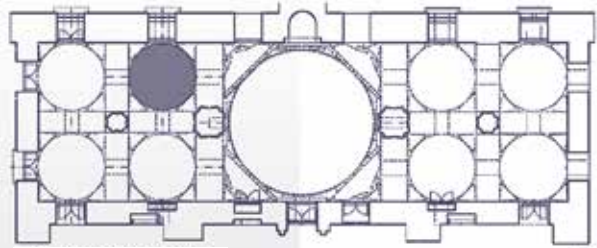
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walls



SECTOR C



before

work phases

dome



tambour



walls



SECTOR D

before

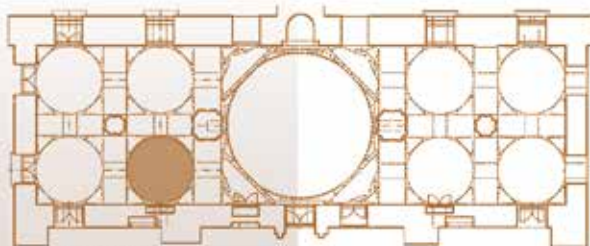
dome



tambour



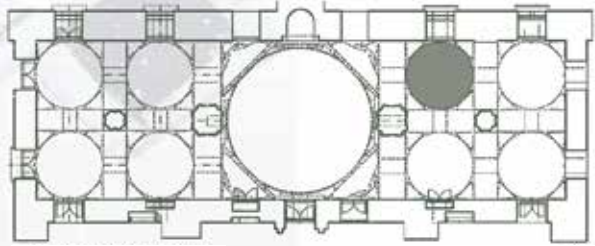
walls



work phases



SECTOR F
work in progress



before

work phases

dome



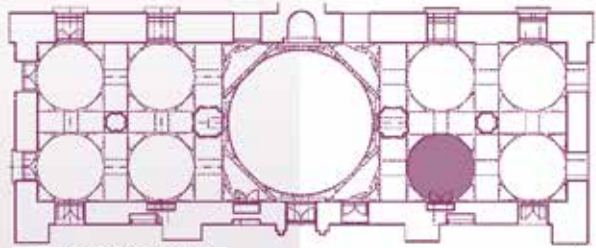
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walls



SECTOR G
work in progress



before

work phases

dome



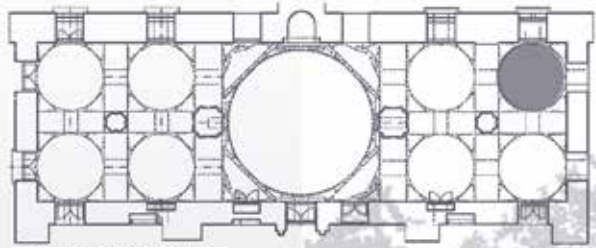
tambour



walls



SECTOR H
work in progress



work phases

before

dome



tambour

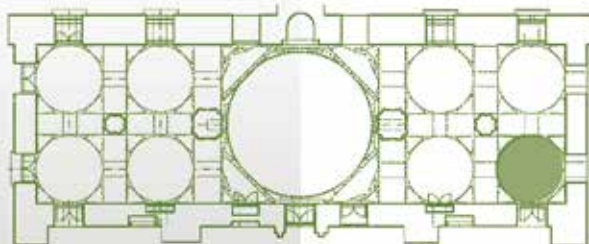


walls



SECTOR I
work in progress

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work phases

before

dome



tambour



walls





The state of conservation of the mural paintings in the Prayer Hall

Over the centuries the Mosque has suffered a significant decay, due to both natural and human factors and in particular caused by landslides and earthquakes that affected the area and provoked serious subsidence in the masonry, threatening the stability of the supporting structure. More critical was the opening of two deep fractures in the walls of the east and west sectors corresponding to the central dome, which had, as a result, a partial lowering of the lateral arches and significant cracks in the pendentives and detachment or deterioration of part of the iconographic setup. Between 1978 and the 1980, to overcome a critical situation, reinforced concrete beams were placed over the arches that supported the minor domes.

These are 40 cm high and surrounded all sectors, except the central one. Because of this insertion, at least 100 linear meters of the polychrome decoration have been lost. However, the decoration was already heavily damaged because of the surface erosion due to the rain water that spilled





out on the inner walls forming the cracks. The water triggered solubilization processes on the surfaces and the formation of salt efflorescence in the construction materials and on the painted plasters. The dissolution and the dragging of the surface of substances within the structure caused vast stains. Although they are more evident on the minor domes, they are also present on the main one. The salts crystallization in some areas engendered the detachment and even the powdering of the pictorial film, while in others the loss of entire painted sections, with the consequent revealing of the underlying wall texture. Moreover, in the past, the decorations had been covered by many lime washes to a height of four meters that hid most of the painted sections beneath. This “wall refreshing” tradition was repeated during the weeks leading up to Ramadan, so as to clean up the environment for the reception of the believers. The layering was executed by throwing buckets of limewater that then trickled down the walls.

From the preliminary analysis that was carried out to check the state of conservation, it seemed clear that the preparatory plaster of the cen-

tral dome had a different composition from the one of the lateral domes: while the latter was made with *qadad*, the former was of a chalky kind and therefore sensitive to the humidity changes. Thus, over time it became insubstantial and in several areas it even flaked off. Again in the main dome, under the windows of the drum, the decoration appeared extremely compromised, with large vertical gaps, due to the runoff of the rainwater from the windows themselves. Mechanical erosion was visible on the surface: chipped plaster, bursting and detachments of the mural septum. To overcome this situation the windows had been bricked in.





The executive technique of the mural decorations

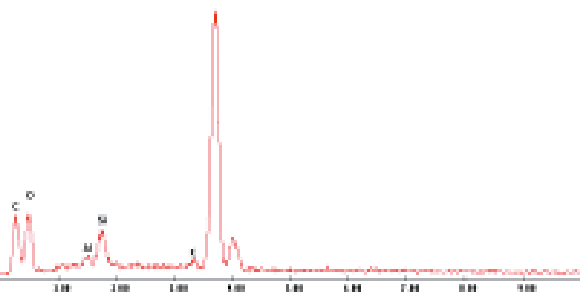
Starting in 2008, the restoration project was allowed to launch a fact-finding campaign with sampling and laboratory surveys, in order to identify the degradation problems and also to understand the original materials and pictorial techniques.

The minor domes

In the two minor domes, the supporting plaster, on which the decoration had been realized, is in *qadad*. This is a mixture of lime and coarse-grained inert (gravel and volcanic limestone) which, during the implementation, is repeatedly wet and beaten with an edged-stone; on the first layer a second one is applied with a finer granulometry and is again beaten until the complete interpenetration of the mixture. The whole is further refined and smoothed with a flat stone in order to make the surface shiny.

On the wet *qadad*, a mural decoration had been painted both with pure pigments diluted in water or melted with limewater. This technique can be included in the fresco technique, which is likely a legacy of the ancient

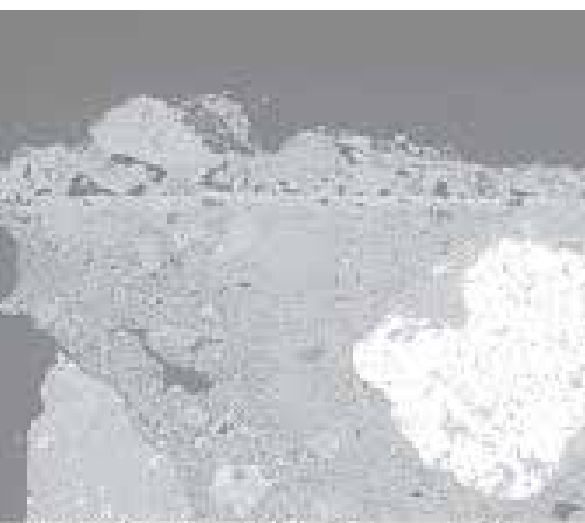




Sample T-2: microphotography with the ESEM (400X)



Sample T-2: microphotography in reflected white light (clear section, 500X)



Sample T-2: EDS spectrum

Roman tradition survived till the end of the fourteenth century. This important revelation was corroborated by the chemical analysis, the stratigraphies, and by the first cleaning samples.

The chromatic range includes five different tonalities: the red, the yellow and the green coming from earthy pigments, the black from the coal and the white from the lime.

The main dome

The executive decoration techniques of the main dome are different from those of the minor ones, for the use of tempera painting. On the first layer of mortar (composed of clay) a gypsum coating is applied and above this a further layer of protein composition, that from the diagnostic laboratory surveys turned out to be animal glue, also used to dilute the pigments.

It was also noted that the red color is a cinnabar mixed with white lead or perhaps *minium* (red pigment, also known as red lead), while the blue and the light blue are made from azurite, mixed with traces of mineral earth. Here the palette is richer, the style is elaborate and modulated and

the frequent use of orpiment gives great elegance to the work. For the formal style of this area it is possible to predict its chronological posteriori, with regards to the minor domes, and for its decorative similarity with the cenotaphs of the inner courtyard, which most likely date later than the construction of the mosque.





The restoration of the mural painting

The restoration of the mural painting was carried out in two different moments, firstly, the restoration of the lateral domes was executed and then work shifted to the main one.

For the two lateral sides, it was decided to give priority to secure the parts where the pictorial film and the plaster were lifted and scaled through the Japanese paper and acrylic resin. After that the limewater layers that covered all the lower parts, and the old padding in the gypsum windows, have been mechanically removed (with scalpels or small hammers). The detached plasters were consolidated by injecting desalinated fluid mortar.

Once this first phase was completed, the cleaning was carried out. On the basis of some tests and analysis performed before, a method of packing with paper pulp and slightly basic solution of salts was chosen, in order to soften and remove the tougher exterior coat and the smoke mottles, due to the use of oil lamps. To remove the brown stains, caused by the migration of tannic substances in the surface, packs made up of de-

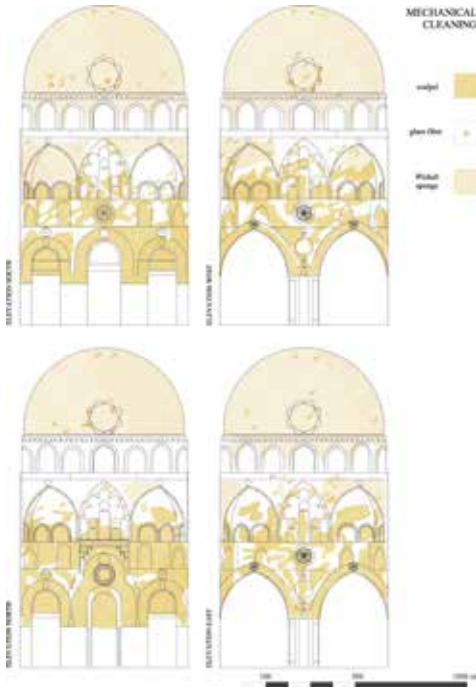


mineralized water and sepiolite was used. During the phase of stuccoing the lacunas of the mortar, the use of two different kinds of lime putty dough were adopted: the first more unrefined and the other, used during the finishing, is made up with thinly sifted elements. The stone dust was used as inert on the micro-cracks, combined with a locally produced lime.

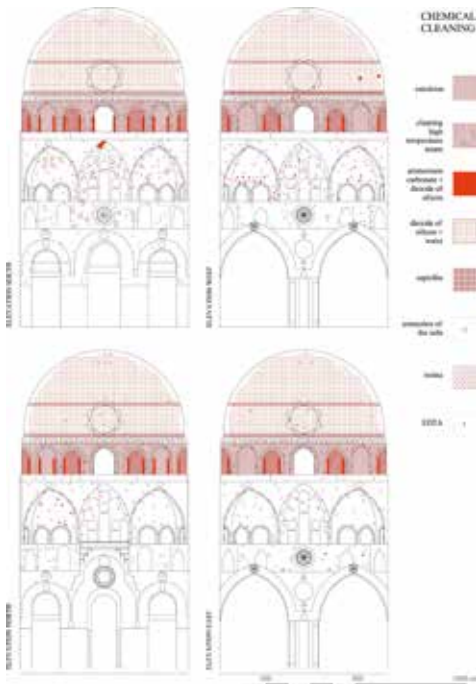
The intervention for the restoration of the main dome required the development of technical methodologies appropriated to the delicate situation.

In several areas, the cohesion of the pictorial layers at the preparatory support made of plaster, which is a hygroscopic nature, was fragile and this implied the lack of resistance even to a mild application of water during the cleaning tests. Moreover, in the areas corresponding to infiltrations by the four windows of the drum, which caused large lacunas, the support and the pictorial surfaces were in a state of almost disintegration and pulverization. It was decided to restore the cohesion of the pictorial film with its substrate, by controlled imbibition of acrylic resin, in-





Main dome. Graphic survey of the mechanical dry cleaning (above) and cleaning with organic solvents (under)



terjected with Japanese paper, in some areas by spraying, in others by padding.

The cleaning phase went through different methods, depending on the situation: use of dry with w-shab sponges, fiberglass pens and scalpels, or a fat emulsion throughout on the deposits of oily substances due to the smokes of the oil lamps.

All the cracks, abrasions and micro-gaps have been recovered with stuccoworks, preceded by a localized consolidation.

Thanks to the removal of the lime layer inside the big niches of the main dome, the whole decorative setting was brought back to light and under them surfaced five-lobed palms on a black background and portions of Quranic inscriptions.



Remark on the methodology for the treatment of the lacunas

The consideration on the methodological approach for the treatment of the lacunas developed from a fundamental observation: the aesthetics of the wall decorations is inseparable from the whole reading of the pictorial apparatus, that is, as it appears to the eye of the beholder.

A modern understanding of the concept of restoration allowed a critical evaluation of the alterations that the different kinds of gaps entailed in the perception of the overall. Therefore, where possible, it was decided to restore the understanding of the unity of the composition according to the principle that “the reintegration must treat each lacuna considering the entirety of the work” and this is particularly important for the mural paintings, which is an integrant part of its surrounding architecture.

After the cleaning and the stuccoing of the lacunas, the operators chose to use a consistent integration methodology, in compliance with the size and localization of the gaps. As per the small abrasions on the chromatic fabric, a light-subdued veiling



Main dome, particular of the vault decoration on the east side (above), particular of the north-west niche decoration (under) and particular of the five-lobed window decoration (right)





was used, while for the small stuccoing, the chromatic continuity was replenished through small hatches. However, the dilemmas arose on the treatment of the large lacunas, which created a disturbing visual clutter compared to the usability of the whole, such as those above the arches of minor domes, where the concrete curbs were inserted. Although filled with a monotone plaster, they determined a clear break in the continuity of the decorative fabric and interrupted both the geometric friezes and the Quranic inscriptions, which, going beyond the mere ornamental appearance, are the revealing elements of the Islamic religious message.

Also not to be underestimated is the fact that strips, friezes, geometries, calligraphies and stylized floral motifs, contribute to the expression of the internal plastic-formal rhythms of the architecture, in which they were conceived.

In the end, the restoration team decided to “reduce this alteration (the lacunas) in order to recuperate the original intention of the decorative apparatus, respecting its authenticity and its essence as a historical document”.

Therefore, a project was established to restore the aesthetic continuity, the religious importance of the Qura-nic inscriptions, and the plastic-spa-tial balance of the architecture.

In accordance with the historical authenticity, the restoration was re-alized through the hatching, a re-touching technique (*rigatino*) that differs from the original painted backgrounds; a touch up re-composi-tion imperceptible from the distance, but identifiable close up. The metho-dology used was to transfer the pre-paratory drawings (studied from the remaining models) on to the plaster with the paper pouncing patterns.

The calligraphic strips having letters or entire words missing required independent research by a Yemeni scholar and expert on calligraphy who, on the basis of existing tracks, was able to rewrite them coherently. For the chromatic coating inside the graphic redrawn scores, high quality watercolor paints were used. In brief, the *rigatino* retouching, based on a system of dashes distinctly colored and placed side by side, according to the principle of the tones division, recreates the sense of gradation.

The method involved to fill in the pla-ster light background was with verti-



Minor dome, particular of a large lacu-na in the south-east coin (above) and overview of the east sector (under)





Minor dome, hatching, retouching and simplification of a floral pattern (above)



cal strokes (in harmony with the original corresponding colors) in order to reach the most unity and continuity of the surrounding decoration.

In order to further distinguish the reconstructions, the details were simplified and, in some parts, not defined. The red and yellow floral patterns, on the white background of the pendentives, and other similar elements, were executed through hatching, however not in a vertical direction, but by setting the colored dashes in concentric expansion, according to the graphic pace of each shape.

The general conditions of the decoration apparatus of the main dome required a different approach.

Therefore, alternative intervention methods on the numerous lacunas were discussed, especially on those underlying the four windows of the drum, on the two in the niches of the northern walls and on the whole wide perimeter band above the *Mihrab*. Finally, it was decided not to restore the lacunas under the windows of the drum, in regard to both their location and size and because a uniform reading of the pictures was still possible, as they prevail on the lacunas themselves.

These were, therefore, compensated with a slightly pigmented plaster just to get the same shade as the original plaster which is visible in the surrounding areas, where fragments of the pictorial film have been lost.

Two measures were adopted: the first was the rebuilding of the missing stucco frames of the arched windows, and the second involved the painting of the octagonal architrave, which marks the string-course and supports the drum above, with rhomboidal motifs to give the impression of illusory jagged reliefs.

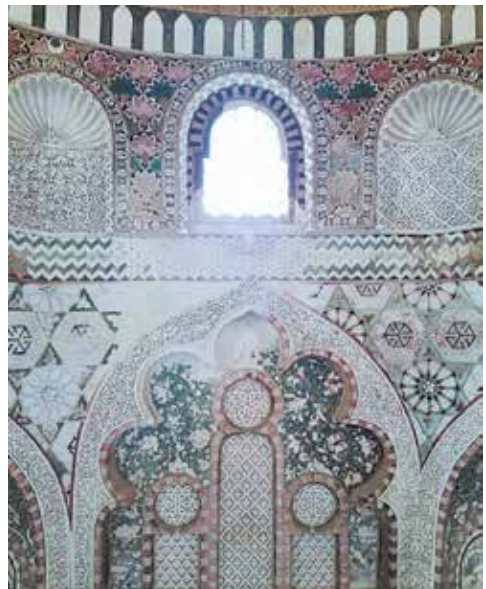
In this case, only the preparatory drawing, with the diamond-shapes was considered, in order to restore the perimeter continuity of the decoration, sanctioning deliberately a differentiation from the original.

The same principle was adopted for the two medium-size lacunas located on the large niches in the corner of the northern wall, inside of which the profile of the floral patterns were traced to define the idea of the preparatory drawing.

The great decorative band which is a meter high and runs all around the perimeter at the height of the *Mihrab*



The main dome, view of south eastern elevations (above) and particular of the architrave and of the five-lobed window (under)





The main dome, north-west niche, reconstruction of the preparatory drawing (above); particular of the strip surrounding the Mihrab before and after the integration (under)



was in a particular situation. The removal of the lime layers during the cleaning phase, highlighted barely visible signs of a long Quranic inscription in *Thuluth* calligraphy, with red-purple outlines that follows carved stucco windows, included in the band itself.

The remaining surfaces a thick coating of five-lobed palmettes, diagonally inserted in half-circles on a black-gray background. This strip is considered an “interspersed register” since it joins the white wall surfaces of the Prayer Hall underlying the richly adorned surfaces of the niches plan above.

The loss of decoration created a break in the aesthetic continuity between the two registers. In addition, as already noted, the Quranic inscriptions on the Mosque walls needed to be highlighted as they announced the Truth of the faith.

Hence, it was decided to recuperate both, the reading of the verses and the harmonious balance between the two registers, reinstating on the surface the outlines of the Quranic inscriptions and redesigning the palmettes with watercolors, so as to maintain a muffled tone, distinct from the original.

An important historical discovery

The discovery of a carved dedication with the decorator signature and the date of realization, hidden under a pierced gypsum hemisphere that was temporarily removed during the work, is of great importance.

This is a significant finding because normally, the Islamic Artist-craftsman remains anonymous.

The inscription reads as follow:

*In the name of Allah
the most Gracious
the most Merciful
There is no other God but Allah
and Muhammad is the Prophet
of Allah
The inscription for the work
of this Noble Madrasa
asks for the benevolence
of Allah for the manufacturers.
Umar Ben
Ali Ben
Abdul Aziz
Give us long life
802*

*The main dome, carved dedication
with date and signature*





The funeral pavilions: *Mashrabiyas* and cenotaphs

The prayer hall leads from the south to an inner open courtyard, closed within high walls, which acts as a gateway to the surrounding environments. On the East and West sides are located the access to the classrooms, where the lessons once took place, while on the southern side, a door opens onto a hallway that leads to the basement. Another door, still on the southern side, allows transit to the ambulatory surrounding the central body of the architectural complex. In the quadrangular space of the court, there are three funerary chapels: the first two, built against the wall of the prayer hall, were probably erected by al-Ashraf II for himself and his descendants, and were only later joined by a third, close to the eastern wall.

The tombs of al-Ashraf II and his son occupy about half of the court and they share facing each other, separated only by a narrow corridor. The exterior façades are made of ornamented wooden panels, called *Mashrabiyas*, and are inserted between vertical wall supports and are topped by five-lobed large arches which are





pierced with geometrical stucco patterns, called *qamariyyas*. The room is covered by a small dome, punctuated by a series of radial ribs which narrow gradually, converging around the rosette of the summit.

Elegant marble cenotaphs are located in the middle of each pavilion, bearing calligraphic inscriptions decorated in polychrome pigments and gold. The walls are adorned with stucco, framed by floral motifs and gold writing in relief on a painted background.

The Cenotaph of al-Ashraf II after the intervention and the wooden panels of Mashrabiyyas (left); he Cenotaph of Al Nasir Ahmad (under)



The *Mashrabiyas* of the sepulchral monuments

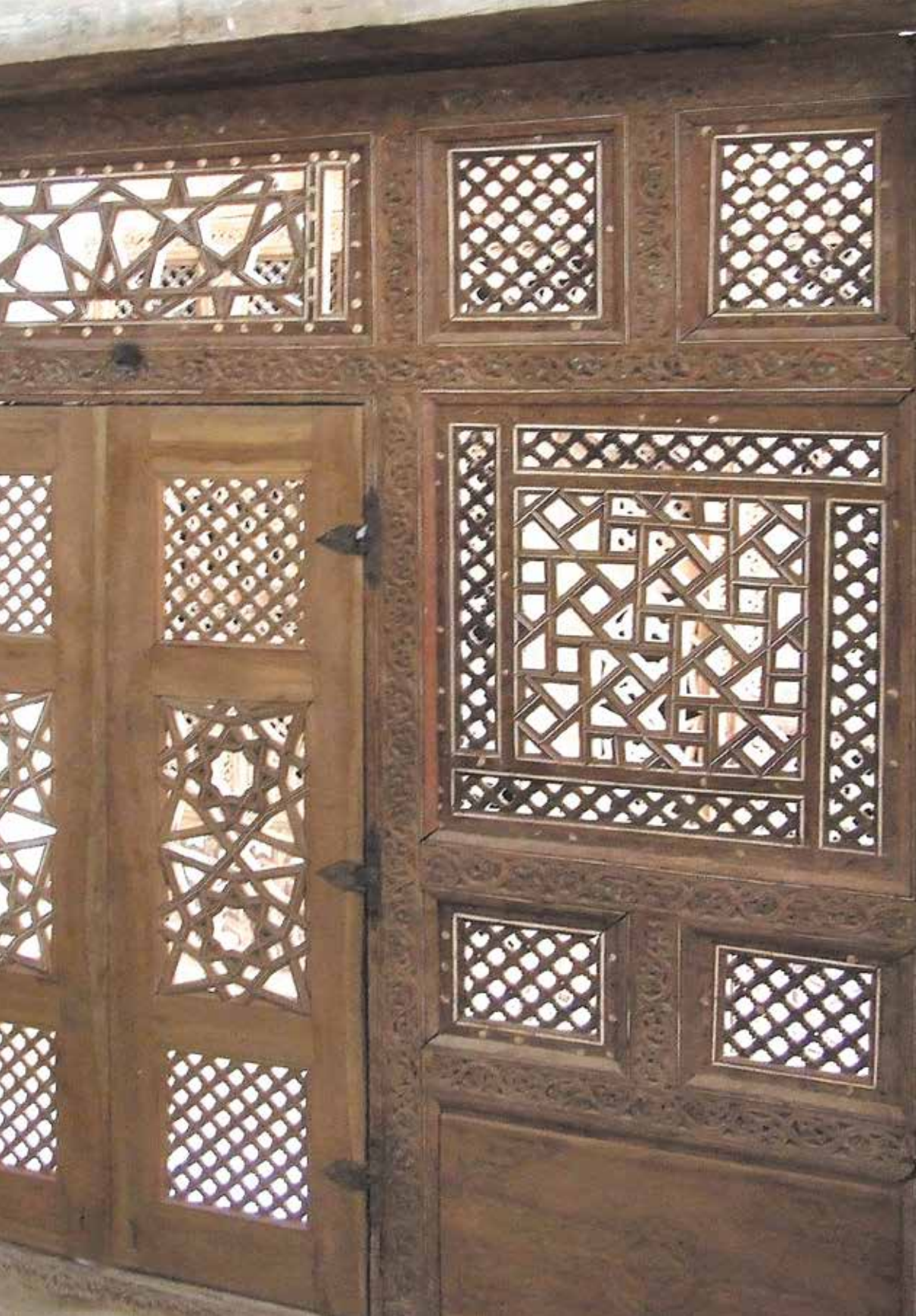
The *Mashrabiyas* of the Mosque are complex wooden works of high quality, carved and inlaid, which surround the tombs of al-Ashraf II and al-Nasir Ahmad. These panels consist of different types of wood, such as *Tonub* (brown-beige), *Homor* (red), ebony (black) and are combined in a rich composition of molded boxes with phytomorphic friezes containing windows adorned by reeled grills (or by intertwined geometrical strips). Each composition is surrounded by carved frames painted with valuable pigments in order to create the illusion of precious stones.

The base panels are covered with ivory inlays, engraved with star-like pentagonal motifs.

The access doors, in the middle of the *Mashrabiyas*, are also richly elaborated.

Mashrabiya panel after the intervention, view from the inside





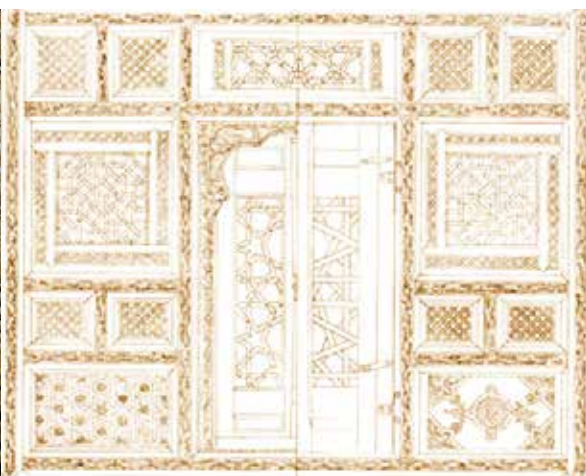
The conservation conditions of the *Mashrabiyas*

In the fifties of the twentieth century some of the Mosque's rooms were converted into workshops for dyeing cloth, but during the seventies the authorities promoted a restoration project and it is highly possible that during these restoration processes most of the wooden artifacts, the *Mashrabiyas* and the precious marble cenotaphs had been covered with an oily green dye.

Surely, during past interventions that we are not able to date, some wooden elements had been fixed or even replaced.

However, upon the start of the comprehensive Restoration Project, the *Mashrabiyas* were in a poor state of conservation: the crowning lintels as well as other structural parts of the support were damaged by termites, causing for some of them, a danger of collapse; many elements were missed or uprooted; in some windows there were none of the turned reels that form the grids; several valuable ivory inlays had been lost or broken; of the four entrance doors to the two main tombs there were only two leafs, which, however, lacked

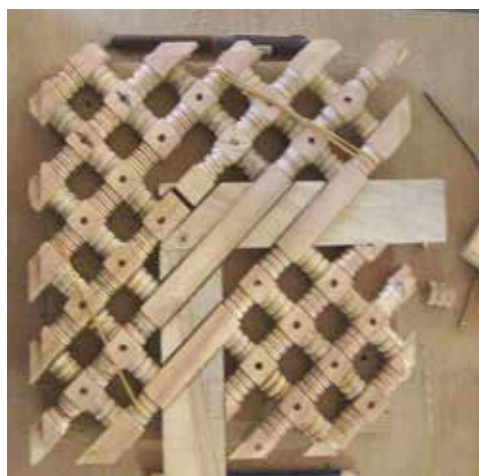




the entire pierced decoration of the windows and several layers of green paint covered the remaining original colors. Meticulous laboratory tests confirmed that the colors found on the wooden surfaces are contemporary with the *Mashrabiya*s themselves and they include some noble pigments such as the lapis lazuli, the cinnabar, the litharge (a yellow tone derived from the lead oxide) and the azurite.



The two layers of the green paint, probably applied between the mid-nineteenth century and the seventies of the twentieth century, had unfortunately penetrated and have contaminated the original colors, which were undoubtedly incomplete and not well preserved at the time of these treatments.



The restoration of the *Mashrabiyyas*

The restoration of the *Mashrabiyyas* started with surveys of limited parts of their ornamentation, which were representative of the issues to be taken into consideration, then, on the basis of scientific evidence, the cleaning tests to remove the heavy green tint began, which altered the quality of the artifact. The applied parameters were selective since it was necessary that the paint removal didn't damage the wooden surface for the conservation of the original polychrome residues.

The use of different methodologies, gave satisfactory results. The large panel partitions, where the wooden surface needed to be exposed and its natural coat had to be preserved, were treated with the scalpel and a softening mixture applied with cotton and brush.

The carved and painted frames were treated by interposing a veil of Japanese paper in order to totally preserve the ancient original pigments.

After the conclusion of the cleaning phase, the superfetation was removed, and some of the lateral impostes were consolidated along with the lo-





Mashrabiya panel after the intervention, view from the courtyard (above); cleaning tiles (left)

ad-bearing beams that had stability problems due to the erosion caused by the termites and the wood-boring insects.

The problem was solved with a woodworm treatment and injections of a blend suitable to fill and consolidate the internal fibers.

The process of reinstatement of the lacunas was a delicate point that needed to be dealt with from onset of drafting the project. Specifically, the lack of panel frames or of the grid windows and the absence of the molded mullions, as well as the pierced doors, required a coherent philologi-



cal choice. All parties agreed to rebuild in order to provide a uniform reading of the whole.

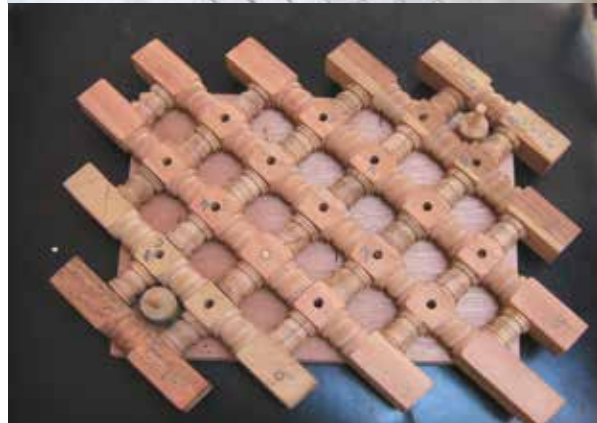
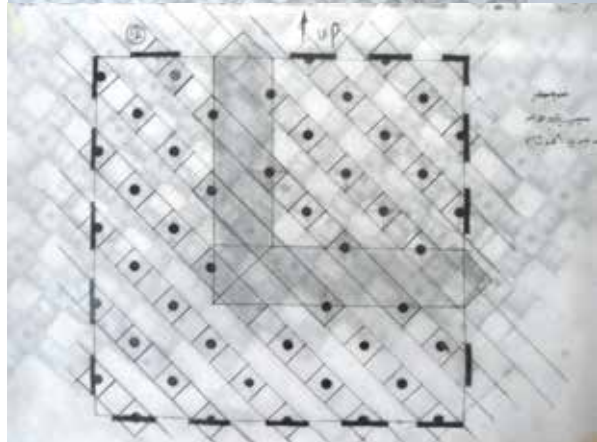
This resolution did not concern only renovation of the aesthetic unity, but also the recreation of those particular conditions, for which the sun filtering through the grates and grids, produces a graceful play of light and shadow, which softly fills the interior space and returns the sacred aura of the tomb.

In accordance with these decisions, all the missing parts were reconstructed with wood kinds, materials and technical procedure having the same characteristics as the originals, but always distinguishable.

The issue of the lacunas in the compositions of the base in the tombs of the two kings was also extremely important because of the preciousness of the panels themselves.

In fact, these have inlays of different kinds of wood that surround ivory carved ornamentation.

So, it was decided to restore the missing frames with the same type of wood in order to strengthen their structure, to remake the ivory decorations in a simplified way without recreating the carving and to reinstate a chromatic balance to the whole.









The cenotaphs within the two funeral pavilions in the northern sector of the courtyard

The cenotaphs of al-Ashraf II and his son, Ahmad, are preserved in the two funeral pavilions leaning against the northern wall. The remains of a monarch, even if he died far away from his domains, were buried in the capital of the kingdom, unlike the members of his family, who were buried where they had died.

These two sepulchral monuments are made of marble and are decorated with fine polychrome pigments and gilts, while others sarcophagus, located in separated sectors of the mosque, are in marble without any polychrome decoration or are in *qadad*.

The Cenotaph of al-Ashraf II before the intervention



The state of conservation

The cenotaph of al-Ashraf II, who died in 1400/803 HJ, consists of a rectangular parallel-piped carved marble that are divided into two main orders: the lower, the podium, has a series of bas-reliefs representing the Rasulid coat of arms, the second has an inscription in middle-relief. On the four sides an engraved Quranic inscription runs along the upper edge. The marble plates are anchored to an inner supporting structure, made of bricks that have been whitewashed with *qadad*, and reinforced by iron bands to which they are attached. The top of the cenotaph is covered by white plates, of a semi-hexagonal shape, with carved inscriptions, that unfortunately are much eroded. On both sides of the top there are polychrome ornaments, while the side elevations are decorated with an inscription in relief, originally gilded on a blue background.

During the seventies of the twentieth century the cenotaph had been painted with an oily green varnish that hid the precious decorations and the top plates had been ruined along with the crowning frame. It was evident that several pieces were disas-





sembled and reassembled badly; some parts of the parallel-piped and the edges had stability problems: the internal decay caused the delamination of the mortar between the bricks and the swelling of the reinforcement bars.

The restoration

The first phase was the structural consolidation through the dismantling of the marble plates that were not in the right position or that had been set incorrectly during the past sabotages. All the crumbled mortars and the incoherent materials were removed, the reinforcement iron bars were cleaned and a new texture of bricks, lime and sand strengthens the ashlar. The cleaning of the marble surfaces, from the very beginning proved to be very delicate and complex since the original decoration in gold leaf, lying on a red-orange bole preparation, was hidden by the tenacious green paintworks, which in turn, covered a previous black tar scale.

The cleaning phase was articulated in two different steps. First, inch by inch, a solution of volatile solvent mixed with a surfactant was used

until the two green layers were totally removed. This operation required painstaking care in the hollows of the gilded bas-reliefs because exposure of the background of red and blue pigments was problematic due to the pigment's extreme sensitivity to chemical solution.

At the end of the first step, the removal of the more adhesive black layer still remained. Elimination of the adhesive layer required a different system which would not damage the gold leaf underneath. At the end of the first step, the removal of the more adhesive black layer still remained. Elimination of the adhesive layer required a different system which would not damage the gold leaf underneath.

This step was very difficult and long and was carried out using a chelate solution with a neutral pH. The result was very satisfactory as cleaning both the bare marble and the gilded arabesques proved to be delicate. Then the interventions involving the integration of the missing elements were initiated.

Starting from the upper edge and between the joints of the different marbles, fillings were realized by trying to get a neutral shade that





could complement the tone of the lighter marble, while around the gray and golden parts, it was opted to use a lower hue through glazing the color.

The final work involved the grazed and incomplete surfaces with the gold leaf, on which the retouching was carried out in order to rebalance the level of the orange color scheme used in the preparation of gold leaf.

The conservative recovery of the cenotaph allows a deeper understanding of its original magnificence that lies in the effect of the white and grey marble, embellished by golden elements.







Are you looking for paradise?

The restoration of the monumental complex of the al-Ashrafiyya Mosque and *Madrasa* is at its end and on June 26, 2014, the Prayer Hall was opened to the believers during an official opening ceremony, in the presence of the authorities of the Governorate of Ta'izz.

In conclusion we would like to quote the appreciation of Dr. Paolo Lembo, the UNDP (United Nations Development Program) representative in Yemen:

*Are you looking for paradise?
Don't go any further, you find it
in this mosque*





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