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Restoration of Al-Abbas Mosque

Asnaf, Yemen



Conservator

French Centre for Yemeni Studies

Marylène Barret

Abdullah Hadrami

Client

General Organization of Antiquities, Museum and Manuscripts

Design

1987

Completed

1996

Restoration of Al-Abbas Mosque

Asnaf, Yemen

2004 Report: Reha Günay

I. Introduction

Al-Abbas Mosque is situated 40 kilometres south-east of Sana'a and 2 kilometres from the village of Asnaf. Dating back to the twelfth century, the mosque is cubic in form, and measures only 100 square metres in area.

Besides its value as an ancient monument, the mosque has particular historical significance since we know its exact date of construction, its founder and its builder. In addition, it stands out among Yemen's cubic-shaped mosques because of its exceptional ceiling, which has survived intact more than eight hundred years.

Of particular interest is that fact that the roots of this type of cubic mosque go back to pre-Islamic temples in the Arabian Peninsula, such as the Ka'bah (in Mecca). In Al-Abbas Mosque the presence of some ancient relics from other sites, including an inscription from a pre-Islamic building, would seem to confirm this link.

The project to restore the mosque began in 1986. The roof was in a state of deterioration and other structural repairs were needed. The first priority was to preserve the ceiling, which was temporarily removed to the National Museum at Sana'a for conservation work (it was replaced in 1996). The repairs to the mosque structure were carried out in 1995 and 1996. The restoration project has allowed this important monument of cultural history to be preserved for future generations.

II. Contextual Information

A. Brief historical background

The mosque dates to the last days of the Sulayhid Dynasty. The Sulayhids were in conflict with the Al-Hadramids, and were eventually forced to leave Sana'a district and go to Jibla. The mosque was evidently built during this period of turmoil.

An inscription in the interior bears the date of construction and the founder's name. This states the date of the building as Zhulhyja 519. In the Gregorian calendar this equates to the month between 29 December 1125 and 26 January 1126. The date is written on a frieze on the east wall, just beneath the name of the founder: Sultan Musa bin Muhammed al-Fitti (or, perhaps, al-Qutbi or al-Fizzi). Another inscription concerns the builder or architect, and can be found on the *mihrab* (niche) inside two medallions; his name is Muhammed ibn Abu l-Fath ibn Arhab.

The name of the mosque is slightly puzzling as it is not derived from the founder, but from a

man called 'Abbas'. No records have been found about this person, but many legends and stories surround him. Abbas is regarded as a holy man, and thought to be buried in the mosque. His supposed tomb is visited particularly by women, who give him votive offerings.

B. Local architectural character

Around the site there are seven villages, although the mosque stands at some distance from them. Asnaf, the largest and closest of these villages, comprises houses built on a stone base with mud-brick upper storeys. The local building character is very similar to that of the mosque. In Asnaf there is even a mosque with the same cubic shape, but here the ceiling is completely plain.

C. Climatic conditions

The mosque is in the highlands, where a continental climate is dominant. Temperatures between October and February range from a minimum of -2 to -5°C to a maximum of 24 to 26°C. Between March and September, the minimum is -1 to 10°C, and the maximum 28 to 35°C. Annual rainfall varies between 200 and 500 millimetres. There are two rainy seasons: between March and April and between July and September. Relative humidity averages between 30 per cent and 50 per cent during the day, reaching 60 per cent at night.

D. Site and topography

The mosque stands on the western side of a 2,350-metre-high hill, in a volcanic region. From the top of the hill one can enjoy a panoramic view of the mosque, the plain, the valley (also called Al-Abbas), several villages and the surrounding mountains. An ancient road leading to the old town of Mareb passes in front of the mosque. An ablution tank, or cistern, is situated just to the west of the building. To the south can be found ruins of another mosque, about the same size and shape as Al-Abbas, with remains of stone columns inside and also with an ablution tank to the south. Further building remains can be found near the mosque. None of these remains has been investigated or surveyed. At some distance from the mosque is situated the guard's house.

III. Programme

The idea of restoration began with the wish to preserve the ceiling, which is of great historical significance but had suffered from rot and warping. In order for this to take place, the ceiling was removed to the National Museum at Sana'a. At this stage it was decided to undertake repairs to the fabric of the building itself. There were various problems: the roof had a hole in it; the brick piers in the attic, holding up the roof, had disintegrated; and the roof beams had become warped and weakened. Other problems included incorrect repair of fallen bricks from the upper parts of the walls; a convex bulge on the south wall; deterioration of the merlons that had formed the crenellation on the roof; the blocking up of one door opening and of all window openings; and the attachment of two alien walls from other buildings to the mosque walls. In addition, some of the mortar in the stone walls had disintegrated, and interior plaster had fallen off.

The numbers of worshippers had fallen off in recent years, perhaps because of these defects, although women continued to visit the tomb of Al-Abbas.

IV. Description

A. Building data

Apart from some wall repairs, the mosque has had only one building phase. Unless otherwise stated the following description relates to the original state of the building.

The mosque has an almost square plan with external dimensions of 10.4 to 10.6 metres by 9.35 metres, and a height of 6 metres. The roof is flat, making the building cubic in shape. The *qibla* wall is 90 centimetres thick, and the other walls are about 70 centimetres thick. Stone walls rise up to the door lintels, which are level with the base of the windows; above this the walls are of brick. The lower walls are constructed in cut-stone masonry of irregular size, while the bricks measure 18 x 18 x 5 centimetres. At the very top, in the restored building, bricks have been laid to form a crenellation pattern. Before the restoration, six merlons were recorded at various points on the roof. The mosque has two entrances: one on the south and the other on the west side. The eastern and western elevations each have four windows, and the southern one has three. The windows are very small and, according to documentation by archaeologist Barbara Finster, two of them originally had window panes formed by ornate sheets of alabaster.

On the exterior face of the *qibla* wall an inscription – actually an antiquity from southern Arabia, dating to the second century AD – is set at eye level. The inscription tells of the foundation of a meeting room at the time of a king of Saba and Dhu Raydan. A stone bench, around 30–40 centimetres in height, surrounds the mosque. A sunken water jar just outside the west door is used by worshippers to wash their feet before entry.

Inside are six stone columns. Four of the columns are pre-Islamic antiquities and three of them have antique capitals, all different from each other. Three more capitals have been found, a cylindrical one at the corner of the roof and two others on the tomb (see below). Since the original columns were of different heights, additions were made to bring them to the same level. The remaining two columns are of brick. All columns rest on simple stone bases.

The *mihrab* is formed by a double recess in the thick wall, which is not visible from the outside. At its corners are four brick pilasters. On top of these, two pointed arches, one inside the other, crown the *mihrab*. Around the arches is inscribed the name of the architect. An inscribed frieze delineates the rectangular frame of the *mihrab*.

At the south-eastern corner of the mosque is situated a tomb, separated from the main part of the mosque by low walls. Believed to have belonged to Al-Abbas, it measures 2 by 2.5 metres. It formerly contained wooden elements (perhaps a fence or a sarcophagus), but these were burnt down in around 1950 on the orders of the then imam, who opposed the reverence of holy men. On the exterior of the mosque, at the eastern side of the tomb, can be found an

opening measuring 62 by 110 centimetres, surmounted with a stone lintel and filled with stones. This aperture might originally have been a window or a door, opening into the tomb. It is interesting to note that the ruined mosque that stands next to Al-Abbas has a similar opening in the same corner, as well as a similar dividing wall. This suggests the existence of a tomb in this building also.

A triple-band frieze runs around the top of the inside walls, directly below the ceiling beams. The lowest band is made of gypsum, the same material as that used around the windows. At the outer edge of the band are floral ornaments, while the inner edge has inscriptions (faded in places). Next to this gypsum band are two parallel wooden bands bearing Kufic inscriptions in two different styles. Together the bands measure 90 centimetres in width. Since they share the same colours and style as the ceiling, the overall effect is to make the ceiling look much larger.

The ceiling is Al-Abbas Mosque's most important architectural feature. The elaborate interior decoration contrasts with the modest exterior appearance of the building. Since the ceiling has the same decorative programme as the *mihrab*, it is very likely that the building and the ceiling are contemporary. The ceiling has survived so well that only a very small proportion (0.5 per cent) had to be completely replaced as part of the restoration process. The ceiling of the Al-Abbas Mosque thus provides an excellent illustration of the artistic style that flourished in Yemen in the early twelfth century.

The ceiling beams run parallel to the *qibla* wall and rest on column capitals, 4 metres above the floor. The whole ceiling is divided into four sections running parallel to the *mihrab*. The section in front of the *mihrab* is larger than the others. Starting at the *mihrab*, the first section has three square bays or caissons; the second nave has four large and four small square caissons, the third has five square caissons, and the last one has four square and two rectangular caissons. Each caisson is separated from the others by beams, and rises in several steps like a pyramid; in other words it is a coffered ceiling.

Beginning from the entrance, the caissons keep rising as they approach the *mihrab*; the caisson in front of the *mihrab* is the highest and has seven steps, pointing to the *mihrab*. According to Islamic symbolism, this succession can be interpreted as the seven layers of heaven.

The beams that support the ceiling are actually round logs, but are enclosed by wooden boards that give them the appearance of long boxes. These boards are fixed to each other with nails, mortise and tenon joints, notched joints and dowels. The beams' horizontal covering-boards are carved, painted and gilded; the vertical ones are only painted. Chemical analysis has shown the paint to be tempera. The motifs used are both geometric and floral. The twenty caissons that make up the ceiling present eleven different compositions, and on a given surface of 100 square metres, eighty different motifs are used. In total, around one thousand separate pieces of wood have been used in the ceiling's construction. According to art historians, the motifs and calligraphic styles used in the decoration are traditional to the area, but also have Sassanid, Fatimid and Ghaznavid influences. The architecture, too, has some similarities with Mesopotamian and Mediterranean building styles. The ceiling, with its definite date, provides an important reference for art historians.

There is a space of 120 centimetres between the ceiling and the roof. This attic would have been necessary for the construction of the coffered ceiling, because the upper elements of the coffers can only be fixed from above. In addition this space has served to facilitate ventilation, thus helping to prolong the building's life.

The beams of the flat roof rest on six brick piers, which are placed above the column capitals. These piers are 120 centimetres high, and at the base are 90 centimetres wide and 45 centimetres deep. The main beams of the ceiling are locked under these piers. The ceiling comprises a layer of thin tree branches covering the roof beams, then a 20-centimetre layer of earth, covered with small stones mixed into a traditional type of mortar or plaster called *qadad*. The roof is also levelled with this material. A small door above the east wall provides an entrance into the attic.

B. Evolution of restoration concepts

The principal goal was to restore the building with a minimum of intervention. To achieve this, traditional materials and techniques were used. Before the archaeologist and conservator Marylène Barret became project manager, there had been inappropriate proposals such as constructing a reinforced-concrete roof. Fortunately none of these proposals was implemented.

Marylène Barret chose to be guided mainly by the findings of on-site research and the techniques she knows well. The Yemeni architect Abdullah Al-Hadrami, who worked with her on the project, also preferred traditional materials and techniques and invited the best local craftsmen to work at the site. The restored building does not deviate from its original appearance, apart from the addition of three waterspouts on the roof (discussed below).

The restoration of the ceiling consisted of cleaning, consolidation and replacing any damaged pieces of wood. The most important tasks here were to reassemble a thousand or so individual pieces, and to support the aged and weakened boards by putting a new carrying structural case inside the old one – a rather ingenious invention.

The primary aim of the project was the restoration of the mosque (especially the ceiling), rather than excavating or restoring the surrounding ruins; indeed, there was neither the time nor the money for such excavation. The only exception was the ablution tank, which had a functional link to the mosque. During restoration a new stone pavement was made, which also helped transfer rainwater in as clean as possible a state to the tank.

C. Structure, materials, technology

The aim of all interventions was to eliminate the damage to the ceiling and the overall structure. In 1986 the coffers on the ceiling were dismantled and transported to the museum in Sana'a. Before putting the restored pieces in place, it was evident that major repairs would have to be made to the roof. At that point the restoration of the building came to life.

Incorrect brick repairs that had earlier been made to the walls were pulled down, and the walls

bonded with new bricks prepared in the same size as the originals. Warped beams were made safe, the stone-filled door and windows were opened up, door panels that were not original were renewed in the traditional manner, and joint mortar was pointed. On the west wall a window frieze inside the door arch was revealed during the cleaning work. The motifs on the frieze seem to be pre-Islamic. Inside the mosque, on the *mihrab* wall, only a small amount of plaster was replaced; the rest was conserved or repaired. On the other walls most of the plaster had to be renewed. Interior walls were covered with mud plaster, prepared with earth and water, and dried grasses when available. Mud was applied to the wall surface by hand and levelled with a wooden trowel. As a last coat, gypsum was applied (to a thickness of 1–1.5 centimetres), and after this coat had dried mustard oil was rubbed over the surface. This process gives a patina to the plaster. The floor was covered with *qadad* and repaired in the same manner.

Renewal of the roof was possible only after the ceiling's old beams had been supported with new ones. Over the column capitals, brick piers were rebuilt in the original size to hold the beams of the new roof. The roof was constructed in the same way as the original one. Earth was laid on the roof and given five months to settle down before the application of *qadad*. The only thing that is different from the old is the plastering inside the attic. This plaster coat preserves the wood of the roof and prevents dust from falling onto the ceiling.

After the completion of the roof, the pieces of ceiling were painstakingly assembled in the museum like a puzzle and then numbered. (The task was all the more difficult since, in the rush of removing the original pieces, no attention had been paid to numbering them.) They were then transported to the mosque, one row at a time. At first the U-shaped supporting boards, then the decorated beam enclosure boards, and finally the caissons were put in place. The supporting system that was used is a very sophisticated one. By inserting U-shaped boards into the old weak boards, an invisible support was provided.

On the old roof there had been only one rainwater outlet, via a channel on the west wall. This was considered insufficient because of the risks that water penetration poses in preservation. So shallow walls were built to divide the roof into four sections, and a waterspout attached to each of three sections. For the fourth section, the old water channel on the wall was re-utilized. These stone waterspouts are the only new elements in the restored building. Also restored were the merlons that form the crenellation on the roof. From the six merlons that survived in different parts of the roof it was possible to tell the exact shape and location of the originals, so that the missing ones could be placed correctly. All new merlons were built out of bricks, as previously.

D. Origin of technology, materials, labour force and professionals

Traditional local techniques were applied throughout the restoration process and traditional materials were used. In Yemen these same techniques are still in use today, so it was not difficult to find the materials and skilled craftsmen. New bricks were easily made like the old ones. Earth, gypsum and the so-called *qadad* mortars are also in use today. The only concern was whether the local labour could achieve the right aesthetic standards, but this was closely monitored by the project team.

Modern techniques and materials, of course, were used for cleaning and repairing the ceiling. Cracked pieces of wood were either reinforced with another layer added to the back or with thin, short strips of wood placed at right angles at the back of the crack, so that the board would become stronger but not too rigid. The ceiling boards, however, had disintegrated over the centuries and were thus too fragile to fix with nails, and so stainless steel screws were used. Some boards did not need any reinforcement and so were left alone. New oak for the vertical support of the beams was imported from France, and spruce for the horizontal elements came from Sweden. All new timber that is not seen from the outside is treated against fungi and insects.

For the repair of the decorated panels, old timber was used wherever possible. Different methods were applied to clean away dust and soot. A mixture of solvents was applied with a cotton swab. Where the paint was powdery and flaky, it needed to be softened with a solvent before being fixed with a diluted resin. The cleaning process was slow and required much patience. The museum provided a suitable place for this work. If the original paint had been washed off, it was left as it was. If a new board was used, it was either left without any ornamentation or decorated only on the two ends with watercolour, leaving the middle part unpainted. Some parts of the decoration were left untouched so that the difference between 'before' and 'after' could be seen. One board with a very well-preserved original decoration was left in the museum as a safety precaution against fire. The new watercolour decorations, either on the *mihrab* or on wood, were made waterproof chemically. If a new board was used to replace a carved, painted and gilded horizontal element, it was not carved but painted to create a three-dimensional *trompe l'oeil* effect. Xylophene was used as insecticide and Xylamon as an insecticide and a reinforcing medium. Sader R 41 was the wood glue; Paraloid B72 mixed three per cent to ten per cent in perchloroethylene, or sometimes in acetone, was the fixing material available in Sana'a. A mixture of ethyl alcohol with various quantities of dimethyl formamide was used to clean the paint. To fix some surfaces perchloroethylene and acetone were used.

In Yemen a type of plaster or mortar called *qadad* has been in use for centuries, since pre-Islamic times, in order to protect wall surfaces from water. Composed of one part lime to three parts volcanic aggregate, it is mixed and beaten hard for some time, then applied to the surface (wall, floor or roof) and compressed with a piece of stone. Smoothing of the mortar continues for several days and during breaks it is covered with a wet cloth or plastic sheeting. When the mortar is almost dry, it is polished with a smooth stone. The finishing is completed by daubing it with warm animal fat. *Qadad* is similar to pozzolanic cement, a kind of hydraulic lime.

V. Construction Schedule and Costs

A. History of the project

In 1981 and 1982 some drawings of the mosque and its ceiling were made. In 1985 the Yemeni Government's General Organisation for Antiquities, Museums and Manuscripts asked the Centre Français d'Études Yéménites (French Centre for Yemeni Studies) in Sana'a to help preserve the ceiling. A preliminary programme was then begun to take charge of

documentation, epigraphic studies and restoration. In 1986 an article about the mosque was published in the journal *Archäologische Berichte aus dem Yemen*, written by Barbara Finster. The same year UNESCO provided a fund for a tin roof and the transport of the upper parts of the caissons to Sana'a Museum for conservation purposes. In 1987 the archaeologist and conservator Marylène Barret was asked to preserve the ceiling. A workshop was established at the museum. Cleaning, consolidation and restoration of the ceiling took three years. In 1988 some ideas were proposed for the restoration of the structure, such as building a reinforced-concrete roof slab over the steel piers.

In 1990 the Gulf War broke out and all restoration work ceased. In 1992 Marylène Barret was offered the role of project-managing all the restoration work at Al-Abbas and she accepted. In 1994 a budget was drawn up, but civil war broke out in Yemen. Only in 1995 could the restoration of the mosque begin.

The first thing to do was to take out the temporary metal roofing and to build a higher roof on separate columns. Only then could the roof be taken apart and the rest of the ceiling be carried to the museum. Wall exteriors were restored, a new roof was built, the ceiling was reassembled, and exactly 870 years after the construction of the mosque, the very last piece of the ceiling was put in place. On 25 May 1996 the rest of the work was completed and the mosque was opened to the public.

B. Total costs and main sources of financing

The first piece of finance came from UNESCO, for a temporary metal roof to protect the building before restoration, and later during the period when the wooden ceiling of the mosque was dismantled. Later contributions came from the French Centre for Yemeni Studies. The total cost of the restoration amounted to around USD 400,000. The Yemeni Government paid only five per cent of these costs.

C. Comparative costs and qualitative analysis

The unique nature of the project does not permit any meaningful comparison of the costs with other projects.

D. Maintenance and ongoing costs

No budget has been allocated for the structural upkeep of the mosque and so regular maintenance is out of question. As the mosque is situated in a remote region, which cannot be visited without written permission from the Yemeni authorities, it is all the more difficult to provide any regular inspection. Between 1996 and 2004 there was only one application of insecticide on the ceiling. It is up to the guard, a local man living there with his family, to take care of the cleaning and protection of the mosque – but even he has no salary. The replastering of the ablution tank and the roof, and the pointing of the new brick bonds, are issues for a future programme. There is now electricity in the building.

VI. Technical Assessment

Because it used local materials and traditional techniques, the restoration of the mosque was relatively straightforward and could be done accurately by local skilled craftsmen, without disturbing the integrity of the building. Apart from the three new waterspouts, no additions were made. No speculative elements were inserted: all new elements can be traced back to original examples, in terms of both their form and their location. New materials and techniques were used only for cleaning purposes and the conservation of the ceiling, and they are not detectable from outside. The importance of preserving the documentary value of the building was respected through every stage of the restoration. The fact that undamaged parts of the plasterwork – and even the graffiti on the interior wall surfaces – have been kept, bears witness to this fundamental attitude, as does the choice of materials and techniques. After eight years of use the building still shows no defects, which is surely proof of a successful restoration.

A. *Functional assessment*

The building is still in use as a mosque: there is no change in its function. However, before the restoration the beauty of the building could not be perceived because of heavy soot from oil lamps. Since the restoration the building's original elegance and decoration has come alive, increasing the interest of the local people. There is not yet a rush of visitors coming from faraway places, as there is no free travel to this area at the moment.

B. *Climatic performance*

During restoration nothing was changed that would upset the microclimate. So long as the mosque is open for visitors air circulation can take place, which is very useful for the wood. The opening-up of the filled-in door and windows has also brought more light into the interior. Since electricity has been installed, three traditional alabaster lamps (of a type traditionally used for burning oil) have been hung from the ceiling with electric bulbs in them. During repair work on the floor, broken pieces of such alabaster lamps had been found.

The wooden elements were chemically treated against fungi and insects. Roof insulation and interior ventilation help control humidity so that fungi growth and insect infestation are held in check. No intervention whatsoever was undertaken to change the acoustic quality of the mosque.

C. *Response to treatment of water and rainfall*

As described above, before restoration there was only one water channel on the roof to drain the rainwater. This was considered inadequate, so the roof was divided into four sections and three new waterspouts were added. The roofing material is water-resistant *qadad*, prepared in the traditional manner. Rainwater coming off the roof runs down to the flagstone floor, and flows into the cistern. The pavement slope is towards the cistern.

D. Choice of materials and level of technology

The choice of traditional materials and techniques was well suited to the craftsmen involved in the project, since they are still using them. Craftsmen such as these would have been responsible for the original building, so little has changed through time. These materials and techniques have been in use for centuries, and so can be regarded as the correct ones also for the restoration.

E. Response to and planning for emergency situations

Thanks to the slope of the building site any floodwater would be directed into the cistern without harming the building. As a result of the improvements to the structural system, the building's resistance to earthquakes is even better than that expected of a building that has survived over eight hundred years. There are no precautionary measures against fire, however: neither running water nor a fire extinguisher is available.

F. Ageing and maintenance problems

The dry weather – there is little rainfall in the area – has kept the building healthy for centuries. Nevertheless, it is to be recommended that a thorough check-up take place from time to time, focusing on the wooden elements. Unfortunately there is no budget for this. The protection of the building is left entirely in the hands of the local guard, so that only his emergency call would lead to an intervention.

G. Design features

The building was not modified during the restoration. As the surrounding ruins have not been explored, its relationship to them remains unknown.

VII. Users

The villagers living in the area pray in the mosque when they visit the building. The mosque also functions as a meeting place where problems between tribes can be resolved. As there is no human settlement in the immediate vicinity, it is thought that it might have been a sacred place even in pre-Islamic times, or maybe the headquarters of a religious leader. Perhaps the legendary Abbas was such a holy personage. The mosque's location high on the hillside, and the overwhelming view it commands, certainly evokes the feel of it having been a place of worship from very ancient times. Women visitors still offer candles, basil leaves and even chickens. Local people are proud of the restoration of 'their' mosque, and are especially happy to have their beautiful ceiling back home again. Pictures of the mosque are shown on television occasionally.

VIII. Persons Involved

The task of restoring the ceiling was given to the French Centre for Yemeni Studies by the

General Organisation for Antiquities, Manuscripts and Museums of the Yemeni Government. After the completion of the ceiling, Marylène Barret undertook the whole restoration project and at this stage she called in the Yemeni architect Abdullah Al-Hadrami to join in the work. The assembling of the ceiling and the restoration of the building were completed by these two experts, working in cooperation.

While assembling the ceiling, two Frenchmen, François de Bazelaire and his assistant Benoit Cruypennick, who are cabinet-makers and restorers by profession, struck upon the idea of supporting the decorated ceiling boards with an inner case. Gilbert Delcroix, former scientific director of the Institut Français des Restaurations des Oeuvres d'Art (French Institute of Art Restoration), also came as an adviser to help with the restoration work of the ceiling. The General Organisation for Antiquities, Manuscripts and Museums assigned a team of seven Yemeni civil servants (Abeer Radwan, Khalida Hassan, Camilia An'am, Adel Said, Rashad al Kubati, Mohamed al Noman, all archaeologists, and Samia Noman, archivist) for the purposes of on-site training, and to help with the conservation of the wooden elements and the *mihrab*.

Along with the conservation team, there were seven other teams of craftsmen with different types of expertise. They worked on specific parts of the building, as follows:

- The construction team worked on stone and brick masonry as well as the delicate dismantling and construction of the timberwork of the ceiling and the roof.
Team members: Mohamed Satar, master builder; Ali al Zabidi, labourer; Ahmed Satar, labourer; Ali al Shadhabi, assistant; Huseyin al Shadhabi, assistant.
- The *qadad* team members: Ahmed al Arasi, master craftsman; Ali Mujamil, Ahmed al Hemi, Ali Miqdam, Taieb al Arasi, labourers.
- The gypsum team that worked on the window frieze, *mihrab* and capitals: Ahmet el Tairi, master; Ali al Tairi, assistant.
- The gypsum team that worked on the walls, ceiling, piers and corners: Mohamed al Namrani, master; Ali al Namrani, assistant.
- The team that paved the stones of the platform and laid the three gutters: Ali al Imad, master.
- The team of carpenters that made the doors and the windows: Mohammed al Siry, master.
- The team of electricians that installed the power supply: Badr al Dubai, master; and an assistant.

Special mention should also be made of the guard of Al-Abbas Mosque, Ahmed al Shadhabi, who worked on virtually every stage of the project, especially the rebuilding of the ceiling.

Several officials from both Yemen and France helped at various stages of the project and facilitated the whole process. Notable on the Yemeni side are the former and present directors of the General Organisation for Antiquities, Manuscripts and Museums, Qadi Ismail al-Akwa and Yusuf Abdullah; the former and present regional administrators of the General Organisation for Antiquities, Manuscripts and Museums, Ali al Hababi and Mohammed al Sayani; the general director of the National Museum, Abdel Aziz al Gindari, who provided laboratory space for conservation work. Mohammed al-Sudumi, wekil of the General Organisation for Antiquities, Manuscripts and Museums; and Ismael al-Kibsi, manager of

Hodeidah, provided assistance with measurements and helped with the restoration of the decoration. On the French side, contributions were made by two former directors of the French Centre for Yemeni Studies, Rémy Audoin and Franck Mermier; and by Jean-Claude Jacq, director of the Division of Social Sciences and Archaeology at the French Ministry of Foreign Affairs.

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Al-Abbas Mosque

Asnaf, Yemen

2001 Report: Ayşıl Yavuz

I. Introduction

Al-Abbas Mosque is situated near Asnaf village, 38 kilometres south-east of Sana'a, capital of Yemen. It is dated to AD 1125–26. It is a small mosque with stone masonry walls, stone columns and a timber-coffered ceiling. The coffered ceiling is covered with painted and gilded floral and geometric patterns, as well as bands of writing, and therefore belongs to a small group of Yemeni mosques with decorated coffered ceilings. This example, however, is the earliest and the most intact. Scholars from the French Institute of Yemeni Studies began studying the building in the early 1980s. Part of the coffered ceiling was transported to the museum in Sana'a, leaving an empty space that was covered with sheet metal. It remained in the Sana'a museum for years, where it was restored over a period of time. The conservation of the ceiling was completed in 1992 and the pieces were replaced when the mosque itself was being restored. The exceptional ceiling was returned to the whole to which it belonged.

II. Contextual Information

a. Historical background

The *kufic* inscription bands underneath the ceiling give the date of construction as 1125–26 AD, and the name of the donor as Sultan Musa bin Mohammad al-Fitti

[Extensive research on the Al-Abbas Mosque is attached at the end of this report as Appendix A.]

b. Local architectural character

Of the surrounding villages, Asnaf is the nearest settlement and has historical connections with the mosque. The town is woven around a small hill, with the exterior walls of the houses almost forming a town wall. The basic building materials are stone and mud brick, with timber used for the horizontal elements. The walls are of roughly cut or rubble stone at the base, extending to varying heights, then continuing with mud brick. The houses are between two and four storeys high, with flat roofs terminating in low parapet walls. The exterior walls are covered with a thick coat of mud plaster mixed with straw for plasticity. The edges of the roofs, as well as the window and door openings, are treated with *qudad*, a mortar and plaster made from lime and crushed volcanic stone cured for a long time, also used for repairing walls. Water is drained through shallow vertical channels, treated with *qudad*, in the walls. The remains of buildings at the site of Al-Abbas Mosque also display these characteristics.

c. Climate

The region is part of the highlands of Yemen. It has a temperate climate which is very dry.

There is a marked contrast between daytime and night-time temperatures, which can vary by as much as 20°C. Temperatures between October and February range between a minimum of -2 to -5°C to a maximum of 24 to 26°C. Between March and September, the minimum is -1 to 10°C, and the maximum 28 to 35°C.

Annual rainfall varies between 200 and 500 millimetres. There are two seasons of rainfall: in the spring, between March and April, and in the summer, between July and September. Relative humidity averages between 30 and 50 per cent during the day, reaching 60 per cent at night.

d. *Site and topography*

Both Asnaf, 1.5 kilometres to the south, and the mosque itself, along with the remains of the few nearby buildings, lie within the territory of the tribe al-Yamani-al-Sufila, which is a faction of the Hawlan-al-Tiyal. The Hawlan tribe is part of the tribal confederation of Bakil. Hawlan is a *mudiryah* (regional directorate) in the Sana'a district, with a population of 160,000. Asnaf has approximately 4,000 inhabitants.

From Sana'a, Asnaf can be reached by a main road, one of the oldest in the highlands, which connects Sana'a to Ma'rib via Gilhana. At present it is paved with asphalt as far as Asnaf, beyond which it becomes a narrow earth road. From Asnaf, the mosque is accessible by two earth tracks. The upper one leads along the slope of the mountain and is used more frequently during the rainy season; the lower track goes through Wadi Al-Abbas and is shared by the seven villages in the vicinity of the mosque. The group of buildings commands a panoramic view of Al-Abbas valley with the villages in the distance.

The mosque is part of a cluster of buildings located on the west side of a volcanic hill named Hadida, which rises 2,350 metres above sea level. The hill is of solid andesite. To the north, west and south, the terrain slopes away; to the east is the mountain. The buildings are situated half way up Hadida, the highest building being the mosque, located on a narrow platform, extending north-south. There are two sets of ruins to its south which merge into each other. The most easterly is a small building, roughly square in plan, at almost the same orientation as the mosque, but about 2 metres lower. It is constructed with rubble stone, covered with mud plaster and *qudad*. Inside there are three small, square, monolithic stone pillars pointing to the existence at one time of two horizontal rows of three columns (if the existing pillars are accepted as being *in-situ*). The building has been identified as an earlier mosque, as excavations in 1993 discovered a *mihrab* (niche) on the north wall, as well as timber remains thought to have come from a timber ceiling or roof.

Adjoining this mosque on its west side are remains of a dwelling built on three levels, where the guard of Al-Abbas Mosque used to live. Because of the slope of the ground, there are basement spaces underneath some of the rooms and remnants of a first floor. The walls of this building are of roughly coursed stone masonry ending very irregularly at different heights. They were completed with mud brick at a later date, but the mud plaster which should have covered the exterior surfaces is absent. The relationship of the north wall with the *birka* (cistern in the form of an open basin) and the steps leading up to the west entrance of Al-Abbas Mosque shows that there is a contemporary and integral connection between the

mosque and the two ruined buildings.

There are two *birkas*, one for each mosque. The *birka* of the second mosque is to the south of it. At present, the upper parts of the walls have crumbled away and part of the staircase inside is missing. The *birka* belonging to Al-Abbas Mosque is to the west of the platform. It is at a lower level, to the north of a flight of steps located between the wall of the platform and the north exterior wall of the dwelling to the south. There are two small basins on the north side of the *birka*, connected to each other north to south, where the dirt and mud would settle before the water entered the cistern. From the location of the basins, the direction of the water flow can be deduced.

To the south of the southern *birka* and at a lower level there is a simple, one-storey building that is used as a stable by the mosque guard, who now lives in a new house built about 50 metres north-east of the mosque.

The platform on which the mosque is situated is not level, but descends towards the west at the corners of the building. The east edge is carved from the slope of the mountain and separated from it by a retaining wall. There are only about three metres between the east wall of the mosque and the retaining wall. In front of both these walls there is a bench-like low wall, encircling the mosque on the east, north and west sides. On the west side, the platform is supported by a retaining wall which rises a little above the level of the stone pavement. On the south side it is delineated by the wall of the second mosque, and on the north it extends into the terrain without any defined boundaries.

III. Programme

a. What conditions gave rise to the formulation of the programme?

Research carried out on the building before 1994 damaged the cultural property and left it in a perilous state. At this time, the Hawlan tribal people started to voice their concern, and objected to the removal of the ceiling, which was taken to Sana'a to be displayed in the museum. They wanted 'their' ceiling back. Because of this protest, the subsequent transportation of the rest of the coffers to the museum laboratory in Sana'a as part of the restoration became a very difficult issue.

A budget was allotted for the completion of the conservation of the coffered ceiling and the restoration of the building itself so that the ceiling could be reinstalled in its original location. The project did not involve any excavation of or intervention with the other buildings at the site.

The state of Al-Abbas Mosque in 1994 was very bad. The removal of the coffers had damaged the roof beams, and the sheet-metal roof cover was harming the remaining coffers because of its effect on the thermal conditions. Worst of all, its static balance, created over hundreds of years, was disturbed. The voids created induced sagging and collapse at various points, which were haphazardly supported by timber posts. At the last phase of the construction of the guard's former house, its walls were built leaning onto the west and south

walls of the mosque. The entrances in the south wall and to the space between the ceiling and the roof on the upper part of the east wall were blocked, as were many of the windows.

b. *General objectives*

Tribal insistence that the ceiling should be returned was a major factor shaping the programme objectives. The building was to regain its function as a mosque and a sanctuary serving the tribes that have used it for centuries. (It should be noted that the mosque was cared for predominantly by women, who cleaned it and filled it with bouquets of basil. Every stone joint and crevice in the masonry was filled with small pieces of paper as tokens of their prayers. It is said that the cenotaph was burned in order to stop the women from coming to the building.) The main objective, shaped under these basic conditions, was to provide a safe haven for the precious ceiling by consolidating the building.

c. *Functional requirements*

Given that the project aim was to restore not only the ceiling but also the functionality of the building as a mosque, the programme had to ensure that it provided everything required for people to congregate – the purpose for which the site was intended even in Saebean times, as the inscription testifies. This naturally included the presence of water for ablution, which meant making the *birka* usable again.

IV. Description

a. *Building data*

Al-Abbas Mosque is a small rectangle in plan, with its longer side running in the direction of the *qibla* (direction of prayer) to the north. Measuring 9.35–9.40 metres by 10.34–10.6 metres, it is constructed of cut stone, to a height that varies between 1.3 metres and 2.6 metres, owing to the slope of the terrain. Above this level the walls are built of brick and finished in a cornice composed of diagonal and seesaw coursing with crenellations on top. The stone parts of the walls taper as they rise, as can be seen in early photographs. Remains of *qudad* can be seen on the north side of the entrance on the west wall. This shows that the building was given a regular coat of mud plaster, in accordance with usual Yemeni practice as observed on the north wall of the other mosque, with *qudad* on top. *Qudad* was used when the plaster started to peel off to fill the joints between the stones and bricks in order to avoid water penetration. This practice is still today regularly used for maintenance and repair. Some of the crenellations atop of the cornice were constructed after the diagonal and the seesaw frieze had disappeared. Moreover, at the corners of the south wall there were ‘dwarf columns’, not crenellations.

Al-Abbas Mosque has two entrances, one at the centre of the south elevation, on the *mihrab* axis, and the other on the west elevation. The latter entrance is off-centre to the south, corresponding to the third columnar bay from the north. The interior is lit by a band of high, small, vertically rectangular windows, all at the same level. The longer east and west

elevations have four equally spaced windows. The shorter, south side accommodates three similar windows. On the west and south elevations one of these windows is located within the lunette of the arch of the entrance. The window openings are filled with sheet alabaster. Barbara Finster, who made a survey of these two mosques, notes that the original alabaster windows of the mosque were decorated with designs and writing, and she assumes that they have been taken from the second mosque, which she believes to be earlier. On the south wall, there is a water-drain to the east of the entrance, extending down to a small basin at ground level. The north elevation is a solid wall because the *mihrab* niche does not project on the exterior façade.

The interior of the mosque is divided into four horizontal bays by three rows of columns, two in each row. The *mihrab* bay is wider than the others. The beams, running east to west, support a coffered ceiling of timber divided into mainly square but some rectangular coffers, most of which recede in several steps, some in diminishing square geometry. The one in front of the *mihrab* is the most accentuated, almost resembling a cupola. The coffered ceiling is carved and decorated with floral and geometric patterns as well as bands of writing. The decoration is richly coloured and gilded. The two *kufic* bands on top of the walls just below the ceiling give the date of construction and the name of the donor. Beneath the coffer at the south-east corner are the remains of walls outlining the area used to house the timber cenotaph was burnt in the 1950s.

The *mihrab* niche is rectangular in elevation and semi-circular in plan with columns attached at the corners. It is covered with a half-dome that has a pointed profile. There is a smaller niche inside the outer one, which is an exact replica. An inscription band surrounds the frame of the niche, as well as the arch of the half dome. There are two discs with writing at the spandrels of the outer arch. The inscriptions on these discs identify the master of the mosque as 'amal Muhammad ibn Ali ibn Arhab'. This means that the master was a local man, as Arhab is a town to the north of Sana'a.

The area underneath the coffer at the southeast corner has remains of walls defining this area, which would have housed the timber cenotaph which was burnt around 1950's. The cenotaph is said to belong to al-Abbas after whom the mosque is named.

All the interior walls are covered with *juss* (gypsum plaster), and the floor with *qudad*. The roof beams do not support the ceiling: the building has two sets of beams, the lower one bearing the coffers, and the one above the roof, with a space of about 1.2 metres in between them. The difference in height was achieved by building short, square brick pillars on top of the columns after the ceiling beams were put in position, locking the ends of the beams as well. On top of these beams a second set of thinner branches was laid, which were in turn covered with twigs and small stones, all fixed with a layer of *qudad*. The roof sloped in the direction of the water-drain, which ran down the surface of the south wall.

Barbara Finster includes Al-Abbas Mosque in a small group of mosques with ornate timber ceilings. This group of mosques has retained characteristics that predate the advent of Islam and Christianity in the mountains and the uplands of Yemen. They are all built to an approximately square plan and have humble exteriors that contrast with their very ornate ceilings. Because of its size and the splendour of its ceiling, she believes that Al-Abbas could

be a memorial mosque. Of the twelve mosques that belong to this group, Al-Abbas is one of the earliest, as well as being the most intact and elaborate.

Solange Ory's book, which covers every aspect of the mosque, mostly dwells on the decoration and the writings. She has traced influences from Iran and Ghazna in the writing of the inscriptions, as well as in the *mihrab*, which she concludes to be a result of the close relationship between the Zaydis of Yemen and those of Iran. As for the decoration, she thinks that only few elements can be attributed to a pre-Arabic heritage. These are the rose forms and the medallions, which are related to the cult of sun worship and are symbols of divinity; the merlons and rings, which can signify the power of a god as well as a ruler, are associated with the great dynasties of Mesopotamia – the Sumerians, Babylonians and Assyrians. These were taken over by the rulers of the Persians, the Parths, the Achemenians, and the Sassanians. Many of the mosque's decorations are related to symbols that are Mesopotamian in origin. The sculptured decoration and the floral interlacing are more similar to their Fatimid counterparts. Ory believes that both the inscriptions and the decoration of Al-Abbas Mosque faithfully reflect the history of Yemen at that period, when close political and commercial relationship between the Sulayhis and the Fatimids led to social and cultural interaction. During this time, artisans travelled from one country to another practising their crafts. The Indo-Iranian influence in the style of the writing reflects the ideas brought to Yemen by the Zaydis, Ismaili missionaries and Indian merchants. From all these different cultural influences, the master of Al-Abbas Mosque created something unique.

Leaving aside for a moment the mosque's spectacular decoration, the site itself has been a sacred place for the congregation of worshippers for twenty centuries. This makes the Al-Abbas buildings, symbolized by the mosque with its stupendous ceiling, even more unique and important.

b. *Evolution of design concepts*

In its approach to the restoration of Al-Abbas Mosque, the team always adhered to the principle of minimum intervention. In the conservation of the timber, the cracked and warped pieces were retained as often as possible, and only the completely crumbled or missing pieces were replaced. The original decoration was simply cleaned, and some of the missing areas restored, using watercolour so that they can be removed if necessary. No attempt was made to replicate the carved decoration on the new timber, but the effect of carving was created through *trompe l'oeil* painting. Some parts of the decoration were left untouched, so that the difference between 'before' and 'after' can be seen. Elsewhere, only those elements that were still in existence or were known from traces and photographs were restored, such as the crenellations. The doors and the windows were renewed in the style of other mosques, but without any decoration.

During the work, the status of the mosque as an archaeological site was always respected. The platform on which it sits was paved without touching anything underneath, and the stones were laid so that they could be removed for excavation purposes at a later date. There is one exception to this approach, however. To guarantee that water on the roof was drained as quickly as possible in order to avoid any possible damage to the ceiling, the drain to the south

was not considered adequate. Three new stone gutters were therefore added to the east elevation and the roof surface was divided into three compartments.

The *qudad* pointing which did not cover all the joints of the stones, was applied to cover all of the stones. The whitewash applied to the *qudad* produced a striking contrast, but this will mellow with time when the pointing acquires a patina.

The area around the buildings was devoid of trees, as can be observed from earlier photographs. During the restoration the seed of a *talh* tree embedded itself at the north-west corner of the platform. The plant was protected and earth retained around it to ensure its growth. Today, it is a young tree providing shade to the platform, and people like to gather around it, making it a focal point.

c. *Structure, materials, technology*

Photographs of the mosque before the interventions reveal no structural problems. A small hole on the roof is all that can be observed before 1986. The removal of some of the coffers altered the static balance of the building. If this had not taken place, the conservation of the ceiling could have been carried out *in-situ* and the most important decorated ceiling of the eleventh century could have been preserved intact. But the worst aspect of the previous intervention was that no plan or chart was made to show from where each timber had been taken, and the timbers ended up lying on the corridor floors of the museum like pieces of a huge jigsaw puzzle. Marylène Barret and the conservation team had to solve this puzzle when the rest of the ceiling was brought to the museum.

The superstructure of the mosque – the dismembered roof and the ceiling – was the only major structural problem of the project. When the whole of the superstructure was taken down, the walls and especially the columns needed horizontal support, which was provided by shoring (described below). The brick pillars above the columns were taken down and rebuilt, and plastered as well. Plaster was also applied to the roof beams as a protection from insects. The complete process of dismantling and re-erection required very careful workmanship. This very delicate phase of the restoration was completed without any damage being incurred, owing to the skill of the craftsmen, and the careful direction of the architect and project manager.

All the materials used in the restoration, from the construction to the finishes, were, as far as possible, the materials used in the original building, except those used in chemical treatment. The independent zinc shelter erected to protect the building during restoration, was the only item for which new material was needed.

The most important utility for this building is water. The west *birka* is now restored and functioning. The pavement of the platform around the building has been given a slight slope so that all the water draining from the roof as well as from the mountainside is collected at the *birka*. There is some water in the *birka* and it is used by the congregation for ablutions. Because the project involved only restoration of the mosque, no WC could be accommodated; at present, the WC in the guard's house can be used.

d. *Origin of technology, materials, labour and professionals*

The technologies used were chosen according to conditions in Yemen as well as the location of the monument. For the conservation of the ceiling some of the materials, such as oak and fir for the beams, were imported, but priority was given to materials available locally. It is because of these conditions, however, that unfortunately no analysis of paints could be carried out because this would have necessitated sending samples to the conservation centres abroad. For the restoration of the building, traditional technologies and materials that are still used were implemented.

Two different approaches to technology were combined and used with the appropriate materials. From the beginning the main concern was the protection of the decorated timber ceiling. Years before the restoration of the building became an issue, interventions to the ceiling and the decoration had begun. Fortunately, the use of unsuitable materials, such as the cleaning of the painted decoration with alcohol and perchloride, as well as the heraldite used by the Egyptian technician, was stopped by Marylène Barret. The timber coffers and decorations were conserved using modern methods, whereas work on the rest of the building was carried out with the original materials and technology, almost as if the building was undergoing major maintenance. This approach retained the microclimate that had ensured the preservation of the timber ceiling for so many centuries.

Different woods were originally used in various parts of the building. Talh, a type of acacia, was used for the decorated pieces, and *elb* (jujube), for the back of the decorated pieces and the beams. The encased beams of the ceiling were replaced with French oak and the verticals with Swedish spruce. Acajou was used for the roof beams, *elb* for the secondary beams and acacia branches to support the roof cover. All the old and the new timber was impregnated with insecticides - xylophane and xylamon - together with reinforcing resin. Where the softwood members had been attacked or eaten by insects, the damaged parts were reinforced using wood from the good parts of the roof or new oak. Tenons and mortises were also consolidated or remade in oak. The new wood was embedded into the good parts of the old wood. Cracked pieces of wood were either reinforced with another layer at the back or with very thin, short strips of wood at the back of the crack, placed at right-angles to it, so that it would become stronger but not too rigid. The perpendicular pieces of wood were fixed with stainless-steel screws instead of the original iron nails because nailing would have broken the fragile original wood.

Two different techniques were used for the decoration. The horizontal timbers were carved and gilded whereas the vertical ones were only painted. Preliminary fixing was carried out with 3–5 per cent metacrylate resin Paraloid B72 diluted in perchloroethane or acetone. In case of powdering and scaling, the wood was first treated with solvent. Cleaning techniques depended upon the cause of damage (dust, smoke, insects), as well as the state of preservation. A fixing-drying-cleaning procedure was repeated until the original layer of decoration was reached. The painted decoration was very carefully and slowly cleaned with a cotton-stick soaked in a mixture of solvent, ethyl alcohol and a little dimethyl formamide, in various proportions as necessary. At this stage the cleaning technique was more important than the choice of chemicals used. The lacunae in the decoration were filled only when necessary, using watercolour. Yellow was used for the gold. A *trompe l'oeil* technique was

used on the horizontal elements to give the effect of carved decoration. The final fixing was done with resin, Paraloid B72, in various concentrations, depending on the condition of absorption in each case.

For the building structure, all the materials used were traditional. New bricks exactly the same size as the existing ones were specially ordered. The traditional materials – *qudad* and *juss* – have been produced and used for centuries, which meant that the proportions of the materials used, as well as the methods of production and application, could be determined by the masons and the teams of craftsmen, under the direction of Abdullah Hadrami. This resulted in some innovations in the use of *qudad*. Before restoration, *qudad* had not been applied to all the joints of the building, only to those that needed waterproofing. The team created bossed *qudad* joints over the entire stone wall, as is done in contemporary building, again demonstrating that the attitude of the craftsmen to the restoration was one of maintenance, as though there was no interruption in the life of the mosque.

Except for the three French experts, and the project manager, Marylène Barret, all the masters, workers and the architect of the project, working as a consultant, are Yemeni and from the region.

V. Construction Schedule and Costs

a. *Project history*

As described above, restoration could not follow a regular procedure because of the damage inflicted by earlier work.

The first documentation of the building, published in 1986, was made by Barbara Finster from the German Institute. The study of Al-Abbas Mosque was entrusted by the Yemeni government to the French Centre for Yemeni Studies, a team composed of Solange Ory (art historian), Marie-Christian Danchotte (Arabist) and Bernard Maury (architect). In 1986, Qadi Ismail al-Akwa, who was then the General Director of Antiquities and Manuscripts in Sana'a, asked the French team to restore the ceiling, through a bilateral agreement between the two groups. The decorated timber at the central parts of the coffers was removed and transported to the museum in Sana'a. The timber was removed through the roof, not only damaging it but also leaving it open. The roof was temporarily covered with a metal sheet that rested on the walls of the building.

In 1987 the team asked Marylène Barret (archaeologist and conservationist) to come and see the pieces of decorated timber, which they had started to clean using unsuitable methods. Marylène Barret stopped this work. In 1988 Qadi Ismail al-Akwa obtained permission for her to conserve the timber and the decoration, which she did for several years, without being part of the mosque project team. Some restoration decisions appear to have been taken that included the replacement of the brick pillars with iron beams, to which Marylène Barret objected because it would alter the microclimate of the building and damage the decorated timber. In 1991 an Egyptian technician was brought in and started to restore the timber with

heraldite. Again Marylène Barret objected and contacted the French Centre for Conservation in France for expert consultation. The method of conservation was consequently changed, but the project came to a halt with the Gulf War.

In 1992 Marylène Barret was asked to take over the project. She invited François Bazelaire to work as a consultant, especially on the problems of the timber, and started to implement the techniques he recommended. In 1993 Gilbert Delcroix, the former scientific director of IFROA (Institut Français de Restauration des Oeuvres d'Art) was invited to approve the techniques and the implementation. In 1994, the budget was augmented to include the restoration of the building itself, in addition to the ceiling.

Because the restoration was a foreign (French) undertaking, Marylène Barret was very discreet about the history of the project and it was difficult even to learn the basic facts about the building; it is obvious that there were many other and serious problems and conflicts with the former team, who never returned, and left no documents, nor passed any information onto the team that took over. Therefore, until a monograph on Al-Abbas was published in 1999, after the restoration was completed, no part of the previous documentation and research could be used for the restoration of the building. The major part of the information presented above is mostly taken from the published sources, and not from the team that was responsible for the restoration. However, this splendid book, with more than six hundred pages, does not give very accurate information on the architecture of the mosque. The dimensions are incorrect by 10-20 centimetres, and the drawing of the wall section (Fig. 7) shows mud brick in the interior of the wall, although Marylène Barret has confirmed that all the bricks are baked. The sizes of the bricks are wrong, and in time more inaccuracies will surely come to light.

This project did not have sufficient funds to finance a measured survey, but a restoration project based on inaccurate information would not have been sound. Marylène Barret's drawings give very detailed information, with accurate measurements. She kept a logbook for the whole process, which began in November 1994 and was completed in June 1996. [Detailed excerpts from the logbook are appended at the end of this report as Appendix B.]

b. Costs and financing

The total sum that the French contributed for the last phase of the project (1992–96) was USD 400,000. This includes the materials ordered for the conservation of the ceiling, such as professional machines for cutting wood, various electrical tools and large quantities of materials and chemicals. The missions to Yemen, plane tickets, insurance, building materials and salaries are all included in this sum. The Yemenis contributed 5 per cent, through the payment of its employees. UNESCO paid for the zinc shelter that protected the building during the restoration; the cost is not specified.

c. Comparative costs and qualitative analysis

The unique nature of the project does not allow a comparison of the cost of the conservation of the timber and the decoration, nor of the total restoration.

d. *Maintenance and ongoing costs*

Due to problems in the region, the project team was not permitted to visit Al-Abbas Mosque for several years. They were given permission only once, in 1998, so that they could treat the back of the ceiling with insecticide.

The guard takes care of the building and cleans it, but a small budget is necessary for its maintenance. The quantity of water collected in the *birka* has not proved sufficient for the number of people who now come to pray at the mosque.

There was no electricity when the building was restored, although an electrical system was installed. In April 2001 electric poles were erected near the building which will soon bring electricity to the mosque. There was never any provision for heating. No mechanical or electrical ventilation is planned, but over the door at the east opening to the space between the ceiling and the roof, an invisible vent remains in the form of a wooden grate above the door, to ensure that there is some ventilation for this critical area.

Four years after the restoration, no visible part of the building displays any need for maintenance.

VI. Technical Assessment

The techniques used in the restoration of the mosque were sustainable and could all be implemented with the material and human resources available. They are all reversible if necessary.

a. *Functional assessment*

The restored mosque has regained its function, serving both ritual and spiritual needs for the villages around it. Women have started to return at *qat* time to clean the mosque and bring bunches of basil. The platform and the mosque interior are also used as a meeting place to resolve disputes among the tribal community.

b. *Climatic performance*

The amount of light that penetrates the small alabaster windows is no less than that of the traditional architecture of Yemen. It is a gentle light and, together with the daylight entering both doors, there is sufficient illumination to allow enjoyment of the space inside, as well as the decorated features, the *mihrab* and the ceiling. The few hanging fixtures, which were probably used for oil lamps, now hold electric light bulbs.

The thick masonry walls and small openings are all that protects the building from cold and heat. Heating has never been a feature of mosques, nor are the houses of the region heated.

Water is very precious, and is collected in cisterns, similar to the two *birkas* in this group of

buildings. The water is directed to the west *birka* through the slight slope of the pavement. The rainwater from the gutters drains down to the pavement and follows the same course. As mentioned above, the rainwater from the drain on the south wall probably originally fed the south *birka*, not the west one. The west one was fed by the water from the slope coming from the north-west. The drains running down the surface of the walls ably accommodate the sudden and abundant downfalls of water during infrequent but violent storms. The three newly added gutters do not seem to be very suitable because the water falls on a stone bench, rather than on bare earth, and the *qudad* joints will suffer from the splashing water.

c. *Choice of materials and level of technology*

The materials and technology selected for the restoration were ideally suited to the project.

The mosque can be approached by car only from the north-west, where there is relatively flat terrain, which is an extension of the platform. Cars can park lower along the road, but four-wheel-drive vehicles can reach the level of the platform. (Most vehicles used here are four-wheel-drives.)

In case of flooding, the platform around the mosque will direct the water to the west *birka*, but the remains of the second mosque and dwelling are likely to suffer due to water penetration of the ground and the basement spaces.

d. *Ageing and maintenance problems*

The materials and construction techniques have been used in Yemen for thousands of years. This particular mosque would have been in very good condition if the roof had not been vandalized. With the exception of the ceiling, the job of restoration strongly resembles major but regular maintenance work. One problem peculiar to Yemen is that people enjoy shooting, especially on joyful occasions such as marriages, when guns are fired into the air. Apparently Al-Abbas Mosque has been the site of such incidents lately because several scars are visible on exterior stones where bullet shots have hit the walls.

e. *Design features*

Nothing was altered during the restoration work, and the group of buildings is very harmoniously integrated into the site.

The mosque does not have a regular congregation because it is not in a settlement, and it was not built as a congregational mosque. The people in the valley stop by for prayer, and there are certainly more people on Fridays. It remains a place for regular prayer, visit and meeting.

The Mosque is now in a sound state of repair which should last for a long time. This cannot be said, however, for the buildings around it, which need proper excavation and restoration so that the unity between the various elements of the integrated group of buildings can be restored.

The only furnishing in the mosque is a wall-to-wall machine-made carpet of a subtle brown colour, which was added by the guard on his own initiative. The lamp holders which were already hanging from the ceiling now hold electric light bulbs.

VII. Users

The direct beneficiaries of the project are the Hawlan tribes. The seat associated with the legendary Al-Abbas can be visited again, as in the past, although the cenotaph is missing. Tribal tradition and *hijra* have been restored to them. The restoration of the mosque also re-establishes the tradition that started with the erection of the two congregational halls in the second century.

During a recent visit, about fifteen to twenty people came by, prayed, had a few words with those present and moved on. A simple meal brought to the platform by the guard was shared by all present – visitors, soldiers, male members of the guard's family and foreign visitors. Everybody seemed to be very happy with the restoration. As is the case with many shrines in the country, on the special days or weeks of *hijra*, the mosque will be full of people coming from near and far. However, the special conditions that prevail in the region do not allow anybody to come without first obtaining permission. Therefore the building is not currently accessible for tourism.

The professionals, the employees of the Ministry of Culture and members of the foreign missions are very enthusiastic about the project. The completed restoration is regarded as the achievement of a near-impossibility, given what had happened to the ceiling.

VIII. Project Personnel

The project started with a bilateral agreement between the French and Yemeni governments, which entrusted the study of Al-Abbas Mosque, and in the last stage, its restoration, to the French Centre for Yemeni Studies. The French Centre was in direct communication with the General Organization for Antiquity, Museums and Manuscripts. Marylène Barret, from the French Centre, was the project manager and also the specialist responsible for the conservation of the timber. The Government Organisation for Antiquities and Manuscripts assigned a team of seven of its employees (Abeer Radwan, Khalida Hassan, Samia Noman, Camilla An'am, Adel Said, Rashad al Kubati and Mohamed al Noman) for on-the-job training, and to work on the conservation of the timber as well as the decoration of the *mihrab*. Abdullah Hadrami, a local architect with experience in architectural restoration, was employed as a consultant for the restoration as well as being in charge of the coordination between the French Centre and the Government Organisation for Antiquities and Manuscripts.

Marylène Barret and Abdullah Hadrami are the two people who saw the project through. Mr Hadrami was also instrumental in the provision and direction of the various teams of local craftsmen who worked on the project. It seems that the job was done without being entrusted to a contractor, through groups of craftsmen who were accustomed to work for Mr Hadrami

on his projects.

Along with the conservation team, there were seven other teams of craftsmen with different areas of expertise, who worked on specific parts of the building:

- The construction team, which worked on stone and brick masonry as well as the delicate dismantling and construction of the timberwork of the ceiling and the roof: Mohamed Satar, the master builder; Ali al Zabidi, labourer; Ali al Shadhabi, assistant; and Huseyin al Shadhabi, assistant.
- The *qudad* team: Ahmed al Arasi, master; and Ali Mojamil, Ahmed al Hemi, Ali Miqdam, Taieb al Arasi, labourers.
- The *juss* team that worked on the window frieze, *mihrab* and capitals: Ahmet el Tairi, master; Ali al Tairi, assistant.
- The *juss* team that worked on the walls, ceiling, piers and corners: Mohamed al Namrani, master; Ali al Namrani, assistant.
- The team that paved the stones of the platform and laid the gutters: Ali al Imad, master.
- The team of carpenters that made the doors and the windows: Mohammed al Siry, master.
- The team of electricians that installed the power supply: Badr al Dubai, master and an assistant.

Besides these teams, there were three French experts. François de Bazelaire and his assistant Benoit Cruypennick, who are cabinet-makers and restorers, came to identify the correct method of wood conservation, and backed the old wood with new wood. Gilbert Delcroix, former director of the Institut Français des Restauration des Oeuvres d'Art, came to assess the work.

There were several officials from both parties who helped at various stages of the project and facilitated the whole process. Notable on the Yemeni side are the former and present directors of the Government Organisation for Antiquities and Manuscripts, Qadi Ismail al-Akwa and Abdullah Yusuf; the former and present regional administrators of the Government Organisation for Antiquities and Manuscripts, Ali al Hababi and Mohammed al Sayani; and the general director of the National Museum, Abdel Aziz al Gindari, who provided laboratory space for conservation work. On the French side, two former directors of the French Centre for Yemeni Studies, Rémy Audoin and Franck Mermier; and Jean-Claude Jacq, Directeur de la Division des Sciences Sociales et de l'Archéologie, Ministère des Affaires Etrangères, have contributed to the project.

Last but not least is the guard of Al-Abbas Mosque, Ahmed al Shadhabi, who worked on virtually every stage of the project, especially the rebuilding of the ceiling.

The sources used for the report are:

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Barbara Finster, 'Cubical Yemeni Mosques', *Proceedings of the Seminar for Arabian Studies*, vol 21, 1991, p.49.

Solange Ory (sous le direction) and Bernard Maury, Christian Robin, Marie-Christine Danchotte (collaboration), *De l'Or du Sultan à la Lumière d'Allah. La Mosquée Al-Abbas à Asnaf (Yemen)*, Institut d'Études Arabes de Damas, Centre d'Études Yéménites de Sanaa, Damas, 1999.

Appendix A: Historical Background

Archaeological surveys and excavations carried out in Yemen reveal that Palaeolithic industries date back some 200,000 to 400,000 years. Evidence of settlements from all the main Stone-Age periods has been found. Furthermore, rock drawings point to the existence of hunter-gatherers and herders between the fifth and the second millennia. The Saebeans were immigrants from the north, as were the Minaeans, Qatabanians and Hadramites, although they spoke a different language. Probably from the north-eastern Arabian region on the Arabian-Persian Gulf, the Saebeans brought with them the rudiments of what was to become the highly developed civilization of Southern Arabia.

The earliest known kingdom in southern Arabia is that of Saba (Sheba), with its capital in Ma'rib. Kingdoms contemporary with Saba were Ma'in, Qataban, and Hadramawt. The Roman invasion, via Egypt, in 25–24 BC destroyed the Minaean towns, leaving the Himyars as the emerging power in the first century AD. By AD 250 southern Arabia was ruled by only two empires: the Saebean-Himyaric Empire based in Himyar in the west, and the Kingdom of Hadramawt, extending from the former Qatabanian territory to Dhofar. At the end of the sixth century AD, southern Arabia became a province of the Sasanid Empire under a Persian *satrap*. In 628 the Persian governor, Badhan, converted to Islam and Yemen followed suit.

There are three important religious groups in Yemen: the Sunni Shafi'is in lower Yemen, Tihama and the Red Sea coastal plain; the Zaydis, who represent the moderate wing of the Shi'ah in the north of the area; and the Ismailis, followers of Isma'il, who is recognized as the seventh *imam* by the Shi'ahs.

The early Islamic governors of Yemen were the Ziyadis, followed by the Yu'furis, the Najahis, the Sulayhis, the Zuray'is, the Hamdani sultans, the Mahdis, the Ayyubis, the Rasulis, and finally the Tahiris, who ruled until the first Ottoman invasion in 1538. The Zaydis, with Yahya bin al-Husayn, who became the first Zaydi *imam* in 897, were a major force in south-western Arabia until 1962. As the various districts were so interlinked, a separate political entity was not formalised before the Ayyubi conquest of 1173.

The Portuguese interest in the ports surrounding India, Yemen, and the Red Sea, as well as Mecca and Medina, was hindered first by the Mamluks and later by the Ottomans. The partial Ottoman occupation of Yemen, prompted by Portuguese naval expansion, took place in 1538 and lasted until the nineteenth century. It ended with their total withdrawal in 1918, leaving the country in the hands of the Zaydi Imam Yahya. The British occupation of Aden in 1839 reinforced the division between the north and the south. The revolution in 1962 led to the proclamation of the Yemen Arab Republic in the north, and the Peoples' Republic of Yemen was founded in 1967 in the south. The two Yemens were united in 1990 under the name of the Yemen Arab Republic.

The many unknowns surrounding the history of Al-Abbas Mosque must be considered within the framework of this historical background. The *kufic* inscription bands underneath the ceiling give the date of construction as 1125–26 AD, and the name of the donor as Sultan Musa bin Mohammad al-Fitti. The only document that mentions the mosque is a *waqf* document dated 1737–38. It gives the name of the mosque as 'Hadida', the name of the

neighbouring mountain. In the legend of Abbas, 'Hadida' is also the name of his Indian wife.

The sultan Musa, mentioned in only one source contemporary with the construction of the mosque, seems to be a local ruler. This manuscript, written by Musallam al-Lahgi, who died in 1150, contains the collected biographies of the Zaydi scholars and their seats, which are called *hijra*. For example, Musallam mentions the creation of one of the principal *hijras* of the Muttarifites in Waqas, 25 kilometres south-west of Sana'a. (The Muttarifityya is a religious movement that developed within Yemeni Zeydism, and Musallam al-Lahgi himself was an eminent Muttarifite.) In the section devoted to the biography of 'The Two Sons of Abd al-Hamid', he mentions the name of a Sultan Musa al-Wasil in relation to Asnaf. Researchers investigating the history of the mosque think that the date of the book and the part relating the death of al-Husayn, one of the sons of Abd al-Hamid, provide sufficient evidence to support the notion that the local sultan of Asnaf, Musa al-Waqas, is the same person as the founder of the mosque. This manuscript also identifies Asnaf as a prominent figure in the Muttarifityya movement.

At the time of the construction of the mosque, Yemen was in a state of political confusion owing to the weakening of the Abbasid caliphate. From the ninth century on, the country had been split and governed by different powers. Tihama was ruled by the Ziyadis, the highlands and the area around Sana'a by the Yu'firis, and the north by Alid Zaydis (until 1962).

The Ismaili movement was introduced to Yemen in 881 by Abu al-Azim al-Hasan, who settled in the west of Sana'a, and Abu al-Huseyn Ali ibn al-Fadl al-Hanfari al-Gaysani, who settled in the south-west. The movement was revitalized in the eleventh century by the Sulayhis, when the capital was transferred from Sana'a to Jibla. At this time the control of Sana'a seems to have passed to the Ismaili movement. In the ninth century, parallel to the rise of the Ismailis, the main group of the Alid Zaydis established themselves in Sa'da. At the time when Sultan Musa constructed his mosque, the Zaydi community had lost its power and had split into two groups: the Husayniyya and the Muttarifityya. The Muttarifityya gained many followers and many *hijra*, to which pilgrimage was made.

From 519 to 1125, the region surrounding Asnaf was apparently subject to a certain amount of anarchy: Sana'a was controlled by a Hamdani sultan, while the Suleyhis, who previously ruled the region, still had a certain influence, and the Zaydis remained a huge presence. They had *hijras* in Waqas, Sina, Sawhat and al-Gabgab, as well as in Asnaf. In this historical context, Al-Abbas Mosque could have been an Ismaili seat (a theory supported by legend, because Al-Abbas was married to an Indian woman who could have been an Ismaili) or it could have been constructed by al-Musa for the Muttarifites, with the little hamlet of Al-Abbas as a *hijra*. In any case, its location, some distance from Asnaf and the other surrounding villages, indicates that it is not a normal mosque for a congregation – it is too small in size to be a Friday mosque for all the settlements around it, and it is too ornate for a small mosque. This seems to suggest that it was intended for a tutor or holy man (*wali*); the unusually decorated ceiling indicates the importance of this person.

The architectural remains as well as the reused inscriptions on the north wall of the mosque indicate Saebean presence. The three pieces of inscription are not in the right order on the wall and there are some missing sections in between. The words refer to a reception hall for

the god Attar, and mention two buildings near each other. Judging from the writing, it dates to AD 150–60. The four monolithic columns and their capitals inside the mosque as well as the two free capitals on the floor are all reused Saebean materials. The lower parts of the walls are constructed in regular cut-stone masonry of unequal sizes and course heights, and the stones on the horizontal courses have an outward inclination instead of being vertical, which is very unusual. Most significantly, the size and form of the mosque plan is said to be very similar to Saebean temples. Together with the so-called 'earlier' mosque to the south-east, these may be the remains of the two buildings that are mentioned in the inscription. This would mean that the reused columns and capitals were not brought from another site but had belonged to the buildings that had previously stood there, and the unusual masonry of the lower walls is formed of *in-situ* remains, not reused stones. The sacred nature of the site was maintained with the construction of Al-Abbas Mosque.

The last issue that needs to be raised concerns the name of the mosque. As already mentioned, the only known reference to the mosque calls it 'Hadida'. This name did not endure, and the name of the donor is not reflected in its present name. There was a timber cenotaph in the mosque, located at the south-east unit, which was burnt on the orders of Imam Ahmed around 1950. The local legend of Al-Abbas is very well known and the cenotaph is acknowledged as his, along with the mosque. It is obvious that Al-Abbas was a *wali* whose remains were placed inside the mosque some time between the twelfth and the nineteenth centuries. It is accepted that the cenotaph was not part of the original building because the inscription names the building a *masjid* (mosque); if it were a funerary mosque it would have been called a *mashhad* (or a *qubba* if it had had a dome).

Appendix B: Marylène Barret's logbook of the restoration process.

November–December 1994

The remaining free upper parts of the ceiling were removed, mapped and numbered *in-situ* (the numbers are still visible on the inner faces of the timber).

December 1994

Abdullah Hadrami joined the project, replacing another architect sent by the Government Organisation for Antiquities and Manuscripts.

January 1995

First week:

The ceiling was shored and the columns braced in all directions. The flat roof was removed.

Second week:

The brick pillars over the columns were documented and removed, the upper part of the wall on the north-west side was removed, the ceiling was removed up to the epigraphic frieze underneath, and the nine very fragile main beams were removed. All of these were sent to Sana'a for treatment. At the same time timber was prepared for the new ceiling structure.

Third week:

Juss covering the *qudad* decoration on the west wall was removed, the fills that blocked the windows and the door on the east were removed, and the dead *qudad* on the stones was removed.

Fourth week:

The building was documented, and the new wood structure of the ceiling was arranged.

February 1995

First two weeks:

The epigraphic frieze underneath the ceiling was protected, and the new timber structure of the ceiling was constructed.

Second two weeks:

A model of the brick pillar was built to test measurements, and six brick pillars were built on the new wood structure as before. The upper parts of all the walls, as well as the north-west, south-west and north-east corners, were restored.

March 1995

The roof was rebuilt, the roof beams and the joists were laid, and the crenellations were completed.

April 1995

The roof surface was divided into four drainage areas by walls supported by the main beams running in the east–west direction. Branches were laid and covered with mud mortar. The roof was left to stabilize for five months. The area around the mosque was cleaned.

May 1995

The benches in front of the walls were repaired, the retaining wall on the west side was repaired, the steps were restored, and the platform was paved with stone. At this stage, a few of the original paving stones were located, but because no excavation was permitted around

the mosque, it was decided to keep them under the new stone pavement of the platform. The pavement was given a slope to drain the rainwater into the west *birka*.

June 1995

The mud plaster on the inner wall surfaces was restored and the *juss* on these walls was restored.

July–September 1995

Work at the mosque stopped. Conservation of the timber and the decoration continued.

September 1995

Laboratory treatment of the timbers continued, the roof was covered with a layer of mud mortar and crushed stones were placed on top of it to hold the *qudad*. A work space for the preparation of the *qudad* was opened in the ruins, near the south *birka*.

October 1995

The *qudad* around the windows was applied, the *juss* frieze in the interior was restored, and the application of *qudad* to the roof was started.

November 1995

Application of *qudad* to the roof continued, joints were pointed with *qudad*, and the west *birka* was restored and equipped with a pump.

December 1995

Application of *qudad* to the roof was completed, *qudad* was applied to the interior floor, the brick pillars were covered with *juss* plaster, the original *juss* on the interior walls was cleaned, and the *juss*-covered parts of the *mihrab* were restored.

January 1996

Juss plaster was applied inside the roof and on the borders at the corners of the exterior walls. All the *qudad* surfaces were treated with *zebu* (cow fat) as a final finish.

February 1996

Doors and windows were made at the job site, alabaster was fitted in the windows, electricity was installed, *juss* on the capitals was restored, and a final mustard oil patina was applied on the *juss* of the interior walls. By this stage the major part of the restoration on the building was finished. In the laboratory, the reassembly and adjustment of the timber pieces were being practised.

March 1996

The six hundred pieces of timber were returned to the mosque to be reinstalled. The *in-situ* decoration was cleaned and fixed, and any unfinished decoration was completed.

April 1996

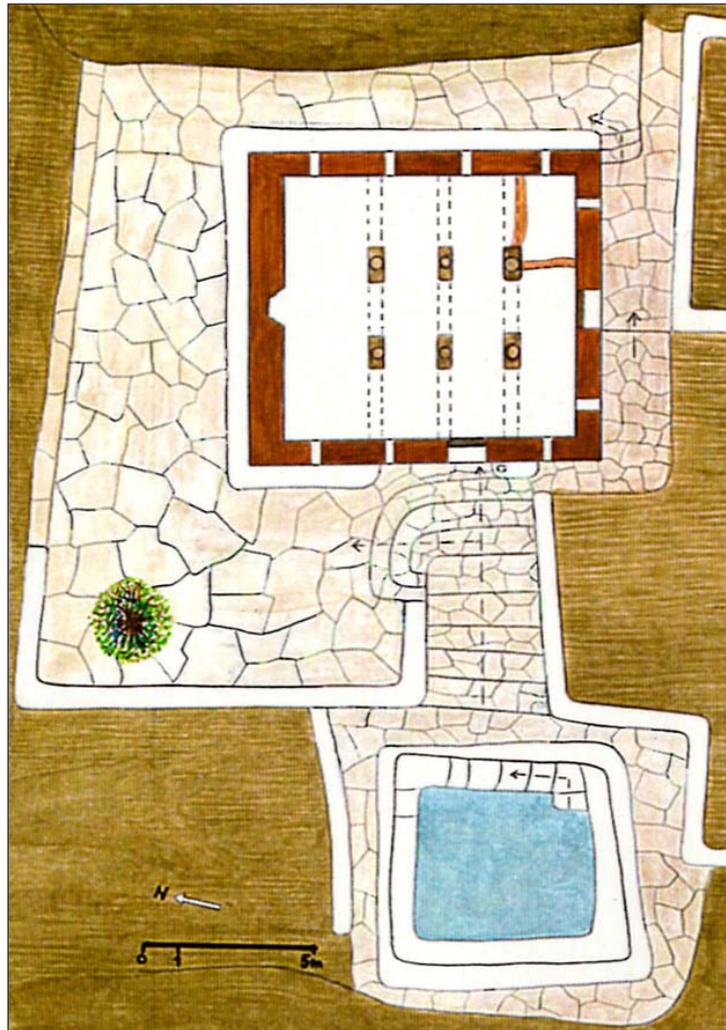
The ceiling was re-installed step by step.

May 1996

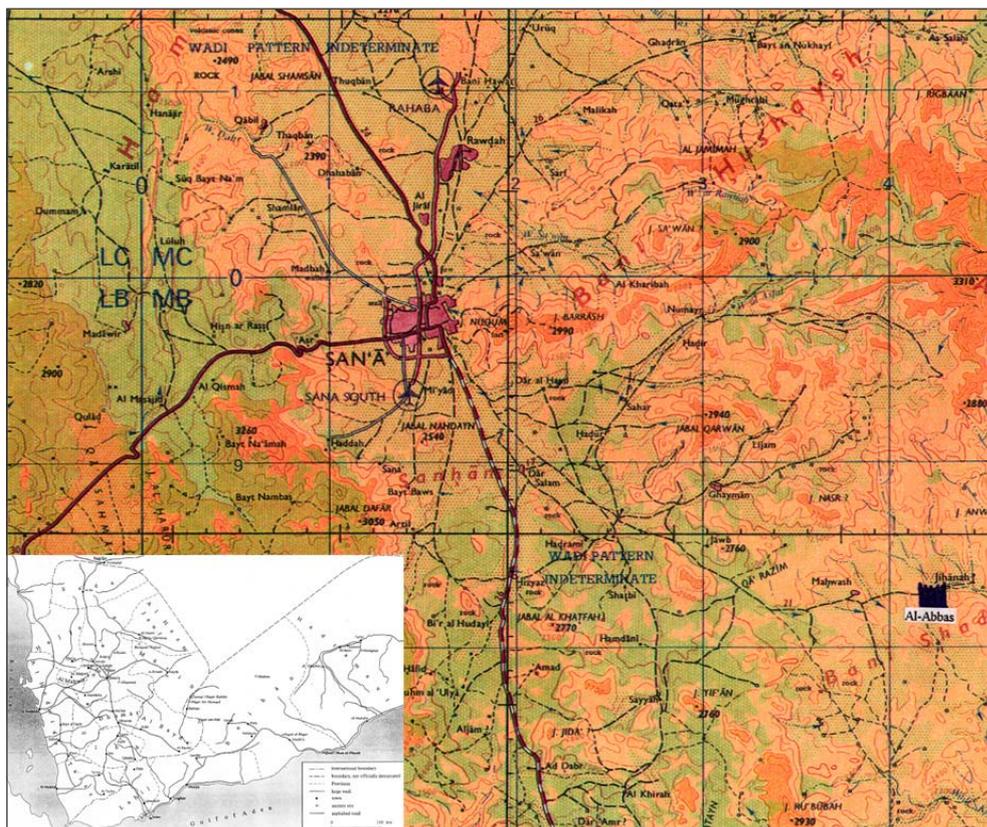
The cursive inscription on the *juss* frieze was retouched and some parts were filled in. The official opening of the mosque took place on 25 May.

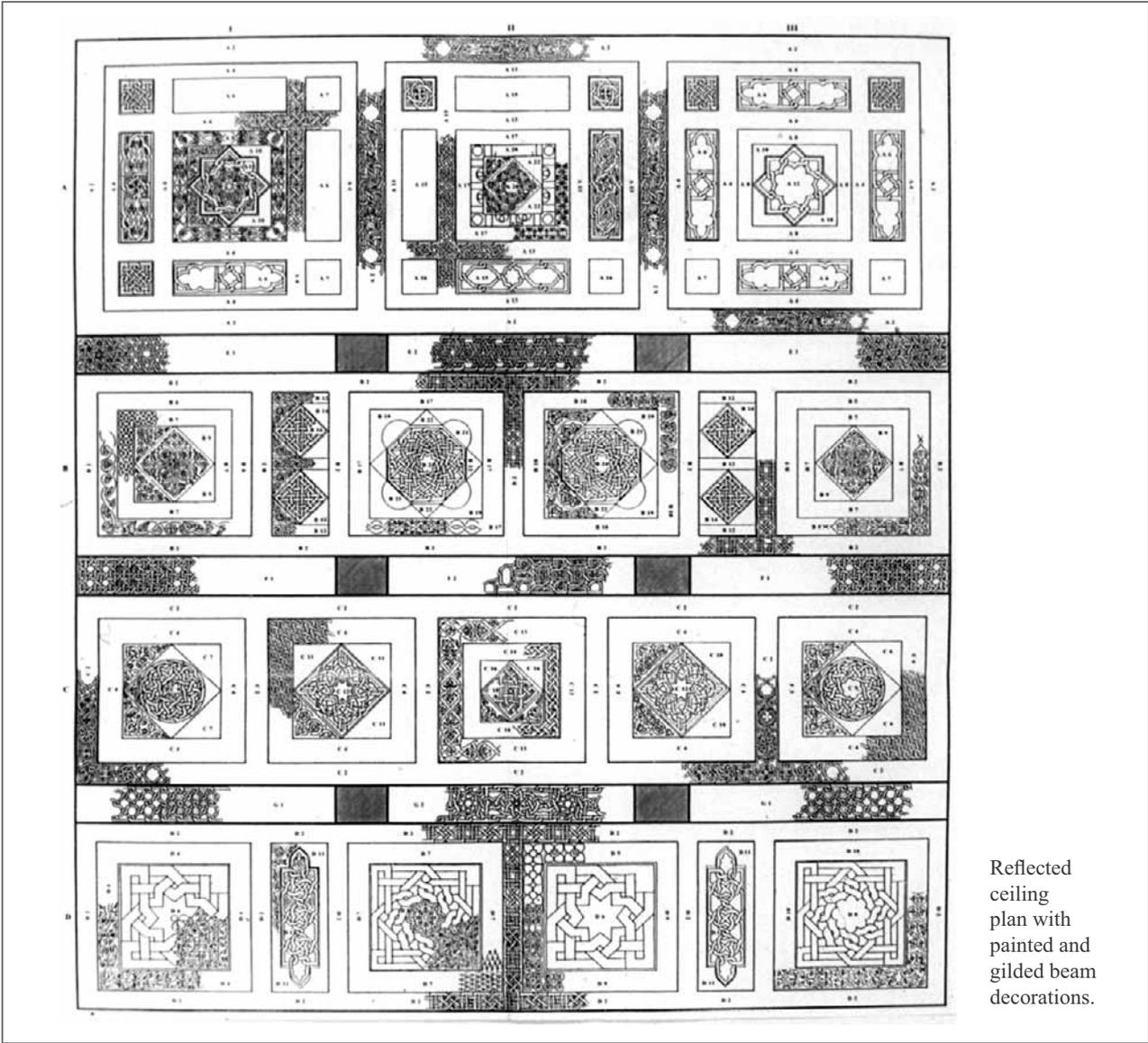
June 1996

The final finishes were carried out at the mosque. At this time the traces of the decoration in the inner part of the *mihrab* were discovered and conserved.

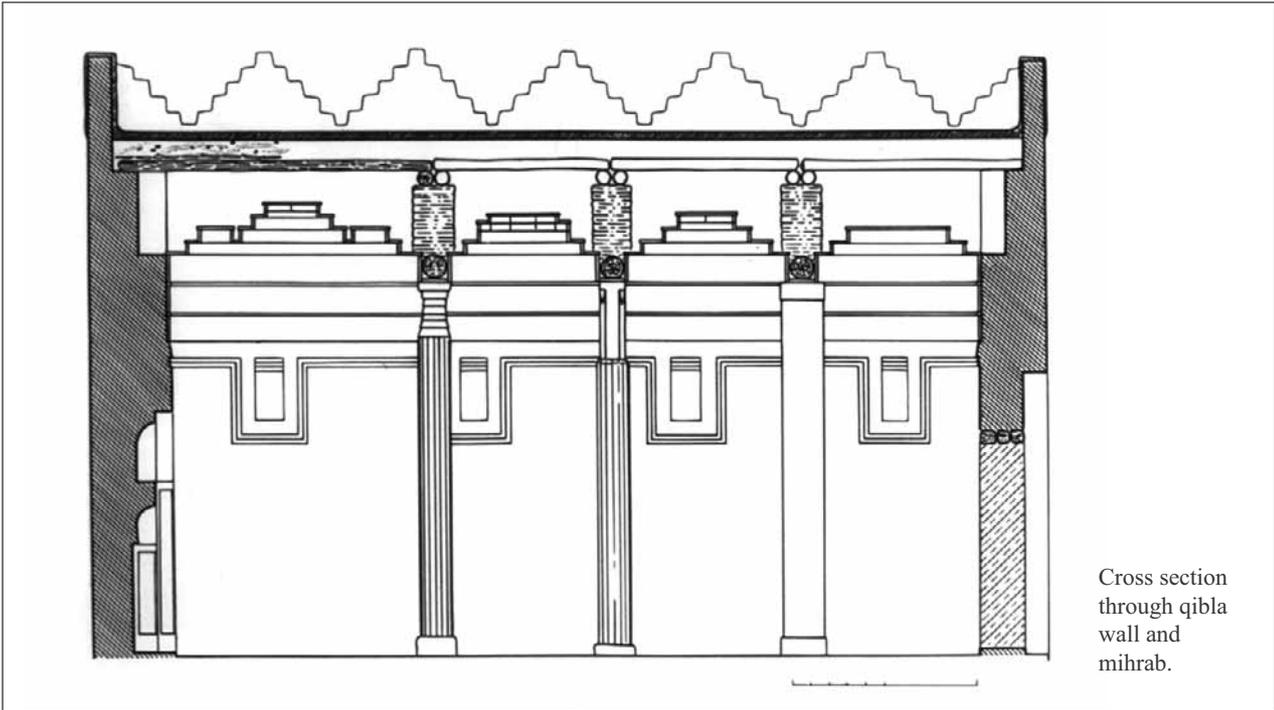


Plan





Reflected ceiling plan with painted and gilded beam decorations.



Cross section through qibla wall and mihrab.



(After restoration) Al-Abbas Mosque is located 38km southwest of Sana'a near the village of Asnaf. The ruins of an earlier mosque and a stable can be seen at the left of the mosque.

The north (qibla) wall after restoration. The outer façade of the qibla wall features an engraving in Arabic; the epigraph dates to the 2nd century.





Prayer hall interior, rising to a height of four metres. (After restoration.)



View of the prayer hall to the mihrab. (After restoration.)



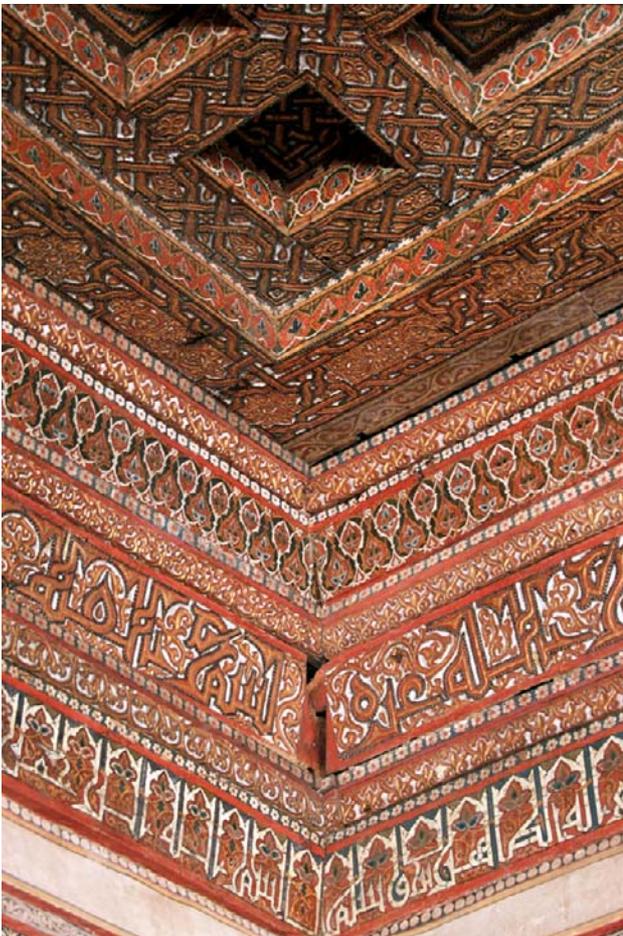
View of the coffered ceiling after restoration.



During restoration, the ceiling was entirely dismantled and removed to the National Museum in Sana'a for cleaning and repair.



View of the central caissons of the ceiling, after restoration.



Corner detail showing the triple-band frieze at the top of the wall with floral ornaments and Kufic inscriptions, after restoration.



Detail of the carved plaster ornamentation, painted and gilded, after restoration.



Cleaning and repair of the dismantled ceiling took place in the National Museum in Sana'a, training Yemenis in modern restoration techniques.



View of the roof after restoration. The exterior was finished with “quadad” plaster; some of the crenellated merlons that were missing were reconstructed.



After restoration. View of one of the two entrances to the mosque, this one on the west façade. The cistern or ablutions tank can be seen in the foreground.