TRAINING COURSE IN MOSAIC CONSERVATION

2006 - 2007

Khirbat al-Mukkayat – JORDAN Hama – SYRIA Jericho – PALESTINE

Osama Hamdan Carla Benelli

2008

BILAD AL-SHAM – TRAINING COURSE IN MOSAIC CONSERVATION – 2006/07
Khirbat al-Mukkayat – JORDAN – Hama – SYRIA – Jericho – PALESTINE

Participating Partners:

JORDAN / Department of Antiquities – Jordanian Ministry of Tourism and Antiquities

PALESTINE / Mosaic Centre Jericho – Committee for the Promotion of Tourism in the Governorate of Jericho in cooperation
with the Palestinian Ministry of Tourism and Antiquities

SYRIA / General Department of Antiquities and Museum – Syrian Ministry of Culture

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Studium Biblicum Franciscanum - Jerusalem

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Map and drawings: Arch. Osama Hamdan, Arch. Nur Khudari, Conservator Franco Sciorilli, Conservator Raed Khalil

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Cover picture: Detail of St. Andrew mosaic floor - Jericho, Palestine

In Memory of Yusuf Abu Fardah

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This new publication of Bilad al Sham training course project illustrates the results of the most recent of the training course, which was held in Jordan, Syria and Palestine during 2007, and is an opportunity to analyze the outcome of the long process of regional cooperation and joint efforts which is going on every year since 2000.

The Department of Antiquities of Jordan is proud to present the results of the training course, carried out in cooperation with the Mosaic Centre – Jericho, the Syrian Department of Antiquities and under the scientific supervision of Prof. Michele Piccirillo, which every year enlarges its impact and involves more partners.

In Jordan, the training course involved a group of young people coming from Jordan, Syria, Palestine, Lebanon, and Italy, giving them the opportunity to improve their skill and capacity to manage the difficult task of preserving and enhancing the immense cultural heritage in ancient mosaic of our region.

The training process is not the only success of the project, which involved various institutions in a friendly and fruitful common achievement. The activity started in 2000 thanks to the essential support of the Department of Antiquities/ Madaba Mosaic School and reinforced the performance that at present, after many years of experience, succeeded in upgrading the school's status of high school into the Madaba Institute for Mosaic Art and Restoration, a world centre for education and training in mosaic art and stone restoration.

This event is a regional achievement and we hope that the Institute will continue to animate and broaden the experience of the Bilad al Sham training course project, in the conviction that the interchange of experience and knowledge will contribute to the long-term goal of preserving our cultural heritage at regional level.

Dr. Fawwaz Al-Kraysheh
The Director of The Jordanian Department of Antiquities

The 6th edition of Bilad as-Sham Training course ended with a sudden and sour grief. Yusuf Abu Fardah, one of the young graduated of the Madaba Mosaic School, who actively attended the training courses gaining a good conservation skill and experience, died tragically in a road accident. He was going home after the participation to a program in the Jordan television dedicated to mosaic production techniques. He was thirty years old!

From such events, maybe more than others, emerges the spirit that moves the training and working experience that we are going through and carrying on, year after year, since 2000: young men and women coming from different countries, places and faiths, joined in the professional daily commitment and members of the same family, who mourn and remember a brother.

What remains become memories. The days spent together in Shahba/Philippopolis in Syria, hosted by the Department of Antiquities in Suwayda, at the beginning of the conservation activity on the mosaic with the personifications of Time, Ocean and Earth, rescued by the Syrian police after being badly lifted and stolen from a tomb outside the walls of Aphamea. Now the work is finally ended and the mosaic is exposed in the local archaeological museum.

From the basaltic plateau to the heat of the depression of the Jericho oasis, in Palestine, where we were busy conserving the Byzantine mosaic of the Coptic church of St. Andrew, helped and pampered by the fatherly humanity of Abuna Mina, the monk who is responsible for the site.

Then again in Syria, in Hama, to help Franco fixing the superb, in many ways exceptional, mosaic of the Church of the Holy Martyrs in Tayibat al-Imam, a masterpiece dated back to the first half of the 5th century, which is difficult to forget.

And then the long days spent together among friends in Madaba and Mount Nebo, over the transjordan plateau in view of Jericho and Jerusalem, to preserve other masterpieces: the mosaic floor of the Church of the Holy Apostles, the Paradise in the Madaba Archaeological Museum and, near the Memorial of Moses, the mosaics of the chapel of Priest John and of the church of Saints Lot and Procopius.

Yusuf went with these memories in his eyes and in his soul, after a last greeting to Franco, his friend and master, the only person who could be at his bedside in hospital and could talk to him. In our name, with our memories.

Michele Piccirillo
Studium Biblicum Franciscanum

This is the third publication in the series of publications on «Bilad Ash-Sham.» This term «Bilad Ash-Sham» denotes in Arabic the great Syrian landmass which includes Syria, Lebanon, Jordan and Palestine. The publication records the work done by young and by their qualified trainers and instructors. The work done by these people is in the field of mosaics and rehabilitation of historic sites with mosaic content. The work these people have been doing within the framework of the third phase of the Bilad Ash-Sham project included the conservation of the following places and sites. In Syria, conservation work was done on Afamia (Apamea), in Tayyibat Al-Imam, and in the mosaics in the museum of Hama. In Jordan work was done on the mosaics in the <Jabal Al Mukhayyat> namely the Church of the Saints Lot and Procupius. In Palestine the group worked on the conservation of the floor mosaics of the Coptic Church of Zacchaeus in Jericho. I have witnessed their work in Jericho and followed its progress since I was there the Governor of Jericho and AL-Aghwar (the Jordan River Rift Valley). On their work in Jericho I have two observations:

1- The team did an excellent job at the church. They contributed to the efforts being made to make this church a destination of tourism and for tourists in the Jericho area.

2- The team was composed only of Palestinian and European workers and volunteers. There were no other participants from the other three Arab countries participating in the project. This has been the case in other projects too where Arab countries are involved.

I would like to take this opportunity to ask our Arab brothers who are members in such projects to take the extra step to come to Palestine to visit and work. I hope they can make it one day. That is a dream.

In this regard it is worth noting that this project and the courses done within its framework are important for two main

reasons. The first is that they enable the participants to enhance their technical and artistic capabilities in the art and science of conservating mosaics. This highlights the artistic beauty of the mosaics. It contributes to knowing better the history of ancient peoples, their view of the world, and in many cases, their view of cultural, artistic, religious, social and economic heritage existing at the time. The other reason which is no less important than the first is that these courses contribute to bringing the participants closer directly and consciously to the dialogue of civilization, make them conscious of the importance of the work they are doing, make them open minded to the other. The other here does not refer to the ancient peoples alone. It actually refers to these workers, trainees and volunteers who work together and come from various and different cultures and environments. These courses establish among them relations of friendship, love, knowledge and cooperation which might exist for years to come. Hence it is necessary to continue these projects in the interest of peoples and their understanding of one another, especially that they are all offspring of a culture that shares many common characteristics and which forms the basis of the Ancient World civilization: with the Indian and Chinese, ours is the cradle of civilization.

Finally, I would like to thank the Jordanian Department of Antiquities, the Syrian Department of Antiquities and Museums, the Palestinian Department of Antiquities and the donor countries and organizations that made this project a possibility. My thanks go also to the Mosaic Center of Jericho which has coordinated this work in Palestine.

Dr. Sami Musallam - Chairman
Committee for the Promotion of Tourism in the
Governorate of Jericho

Bilad Al Sham
Training Course in ancient mosaics conservation

The training course in ancient mosaic conservation Bilad al Sham has been performed also this year, as forecast meeting of trainees and conservators coming from the countries of Bilad Al Sham (Syria, Palestine, Jordan and Lebanon), enriched with the experience that Italy can offer in this field.

Since 2000 the Mosaic Centre Jericho and the Madaba Mosaic School of the Jordan Department of Antiquities have carried out, during the summer, joint training courses in mosaic conser-

During the final event at st.Andrew church in Jericho Dr. Sami Musallam Governor of Tubas and Father Mina give the certificate to trainees

During the final event in Jericho

During break

vation. The experience has been very successful and since 2002 Syrian and Lebanese participants joined the Palestinian and Jordanian trainees, implementing the training in Jordan and Syria.

The last training course, carried out in 2006-7, was attended by twenty one trainees coming from Jordan, Lebanon, Palestine, Syria, and the news this year was the participation also of European trainees, coming from Italy and Spain. The aim of their presence was to share information regarding the cultural heritage and situation of the region, and to create opportunities for young participants coming from the southern and northern shores of the Mediterranean to exchange experience of life and knowledge.

Different phases of a three-month training course were held in Hama (Syria), Madaba (Jordan) and Jericho (Palestine).

The working team during an excursion in Jericho

Prepared and managed by the Mosaic Centre Jericho – Committee for the Promotion of Tourism in the Governorate of Jericho and by the Madaba Mosaic School in cooperation with the Jordanian, Syrian and Palestinian Departments of Antiquities, the European NGOs CISS (Italy) and ACPP (Spain), and the Studium Biblicum Franciscanum, the project has been funded by the Network of Networks Anna Lindh Euro-Mediterranean Foundation for the Dialogue between Cultures.

Objectives

1.To train and update local specialised staff in preservation and maintenance of local cultural resources.

2.To preserve important archaeological remains and safe them from abandon and neglect, thanks to the practical experiences of conservation during the training process.

3.To enhance the huge cultural heritage in mosaics of Roman,

Final event in Madaba, hosted by the Jordanian Department of Antiquities

The team during a visit to Mount Nebo

The team visits the Church of Saints Lot and Procopius at the end of the intervention

The team during the final event in Madaba, hosted by the Jordanian Department of Antiquities

Byzantine and Early Islamic period of the area, focusing on its variety and diversity.

4.To spread awareness among local population and in Europe about the importance of local cultural heritage and its preservation.

5.To exchange cultural experiences and knowledge between Northern and Southern shores of the Mediterranean Sea.

Activities

The project developed four main activities:

1.On job conservation work. It was an integral part of the training program. Special attention was dedicated to this part of the project due to the lack of specialists in this field in the southern countries of the Mediterranean and to the need to train local staff able to safeguard local cultural heritage. The staff and

the trainees attending the course projected, carried out and documented all the activities of conservation, which was conducted in three sites:

In Hama, Syria we handled the lifted mosaics from Aphamea on which we had worked also in the past. The objectives of the training course was to complete the intervention of conservation, giving the opportunities to trainees to experiment the various stages of the work.

In Jericho, Palestine, we worked in the Church of St. Andrew, a site that belongs to the Coptic Orthodox Patriarchate. During the training course we completed the conservation work which was started in previous years.

During the final event in the Church of Saint Andrew in Jericho

Team and visitors in the Church of Saint Andrew in Jericho during the conservation work

Preparing the intervention in the Church of Saint Andrew

Final event in Jericho

In Khirbat al Mukhayyat – Madaba, Jordan, we intervened in the Church of Saints Lot and Procopius. The Church was suffering from various problems and we were obliged to lift and re-laid the mosaic.

It should be noted that the interventions have been intense and comprehensive. Trainees carried out practical experience of work over various mosaics, which were suffering from different problems. The solutions applied have been chosen according to the needs of each site giving the trainees an opportunity to observe, perform and gain broader experience of work.

2. Theory lessons, organized in Jordan and Palestine, were conducted by local experts in cultural heritage. Trainees could learn fundamental issues related to mosaics and heritage conservation and reinforce their technical, artistic and historical knowledge. Lectures were open also to local communities.

3. Excursions and educational trips in archaeological sites, cultural places and conservation yards were also organized in the countries where the training course was held. The objective of the excursions was to broaden the information of trainees regarding the cultural heritage and to enjoy the beauty and richness of the region.

4. The forth activity has been carried out in Europe. It concerned the organization of poster exhibitions in Italy and Spain. Thanks to the preparation and exhibition of posters we could illustrate the results achieved by the project and describe the activities carried out in its different phases. The exhibitions have been organized in Italy by the Italian Ngo CISS and in Spain by the Spanish Ngo ACPP. The main objective of the exhibitions was to increase the awareness of local European communities concerning cultural heritage of the Southern countries of the Mediterranean and to approach different cultures.

Staff and Trainees

The Jordanian Department of Antiquities, directed by Dr. Fawwaz Al-Kraysheh, participated in the project thanks to Ms. Riham Haddad director of the Madaba Mosaic School. The Syrian Department of Antiquities participated thanks to Dr. Ghias Klesly, Mr. Majd Ahjazi, and Ms. Loda Mahfudh.

On behalf of the Mosaic Centre Jericho, Arch. Osama Hamdan directed the project and Ms. Carla Benelli coordinated it under the scientific supervision of Prof. Michele Piccirillo of the Studium Biblicum Franciscanum. The mosaic experts, Mr. Franco Sciorilli and Mr. Antonio Vaccalluzzo, monitored the training and conservation activities.

The trainees were: Ms Loreen Al-Khouri, Mr. Ziyad Aziz Othman, Mr. Mohammad Frej, Mr. Yusef Abu Fardah, and Mr. Nimer Zoubi from Jordan; Ms. Badr Jabbour-Gedeon and Ms. Ghada Salem from Lebanon; Mr. Mohammad Al-Subaih, Mr. Nader Ladah and Mr. Munzer Aliessa from Syria; Mr. Rasmi Al Shaer, Ms. Kholoud Ateeli, Mr. Imad Doudin, Mr. Nidal Khatib, Mr. Mosab Audeh and Ms. Na'ama Shawa from Palestine, Mr. Fernando Prieto Coronel and Ms. Maria Gaston Betran from Spain, and Francesca Sonzogni, Silvia Angeletti e Federica Bertinato from Italy.

Conservation activities in the Church of Saints Lot and Procopius in Jordan

Conservation activities in the Church of Saints Lot and Procopius in Jordan

Mosaics of the Church of St. Andrew (Mar Zaqqa) Jericho – Palestine

Historical background

The ruins of the Byzantine church of St. Andrew are located in the southern entrance of the oasis of Jericho, near the Herodian remains, along the old road to Jerusalem.

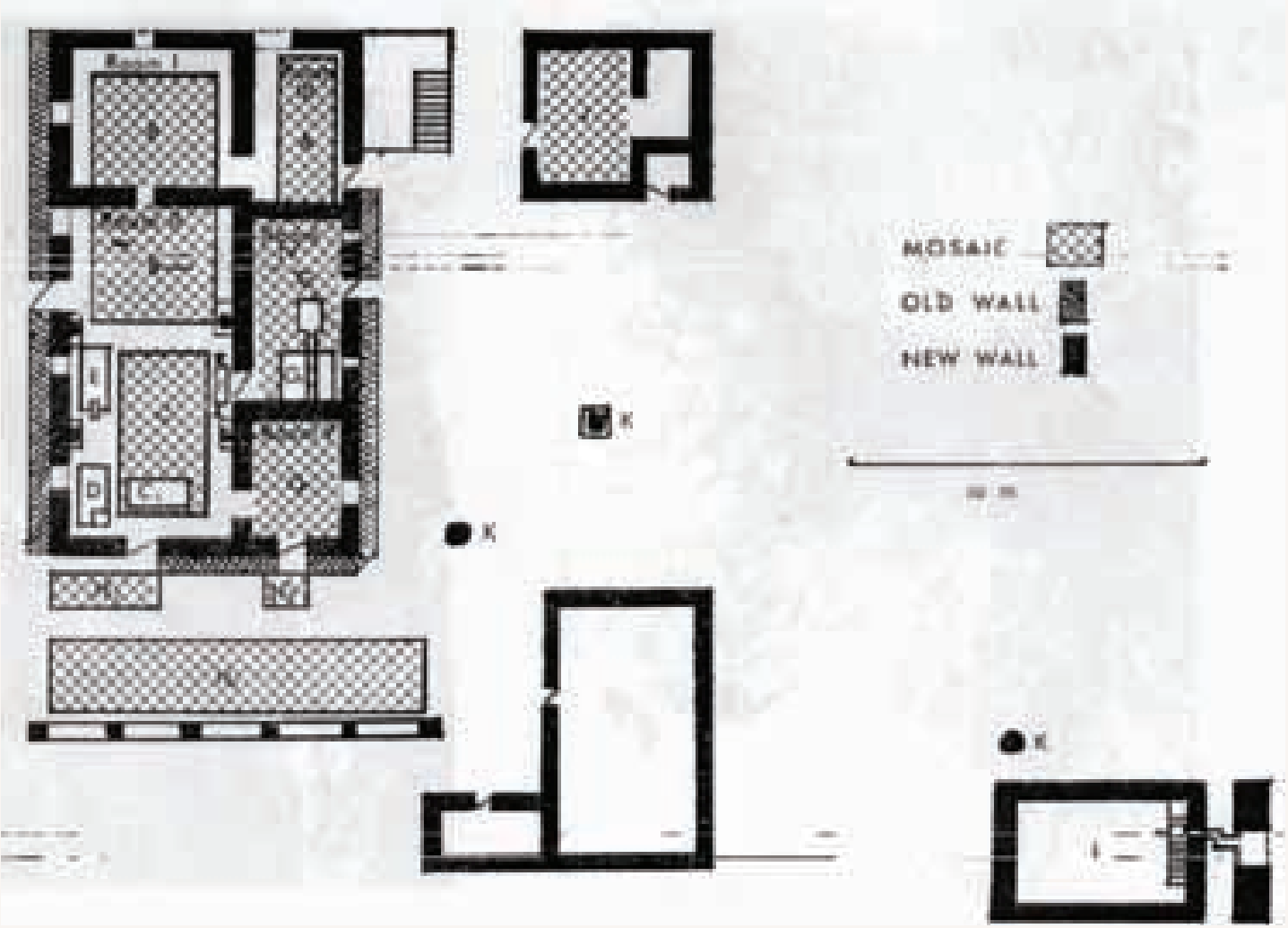
In 1935 the Coptic Orthodox Church purchased in Jericho the ruins of the church, believing that they had acquired the remains of the house of Zaccheus, the small of stature tax collector, where, following the Gospel, Christ rested during his travel to Jerusalem.

The church of St. Andrew was built over a necropolis and inside there are three accesses to holy tombs, venerated as relics, one of which regarded as the tomb of Zaccheus.[1]

A new building was built from 1937 to 1939 over the Byzantine remains, encompassing the ancient mosaic floor inside the new construction.[2] The building included five rooms, one of which used as chapel. The site was identified and published in 1951 by Father Augustinovic as St. Andrew, on the bases of an ancient dedicatory inscription in the mosaic floor.[3]

In 1966 Otto Meinardus visited and studied the site.[4] The plans that he prepared on the occasion show the five rooms, all paved with mosaics, and the remains of a piece of mosaics outside the

Location of the Church of St. Andrew in Jericho



Map of the buildings in 1966 (from Meinardus)

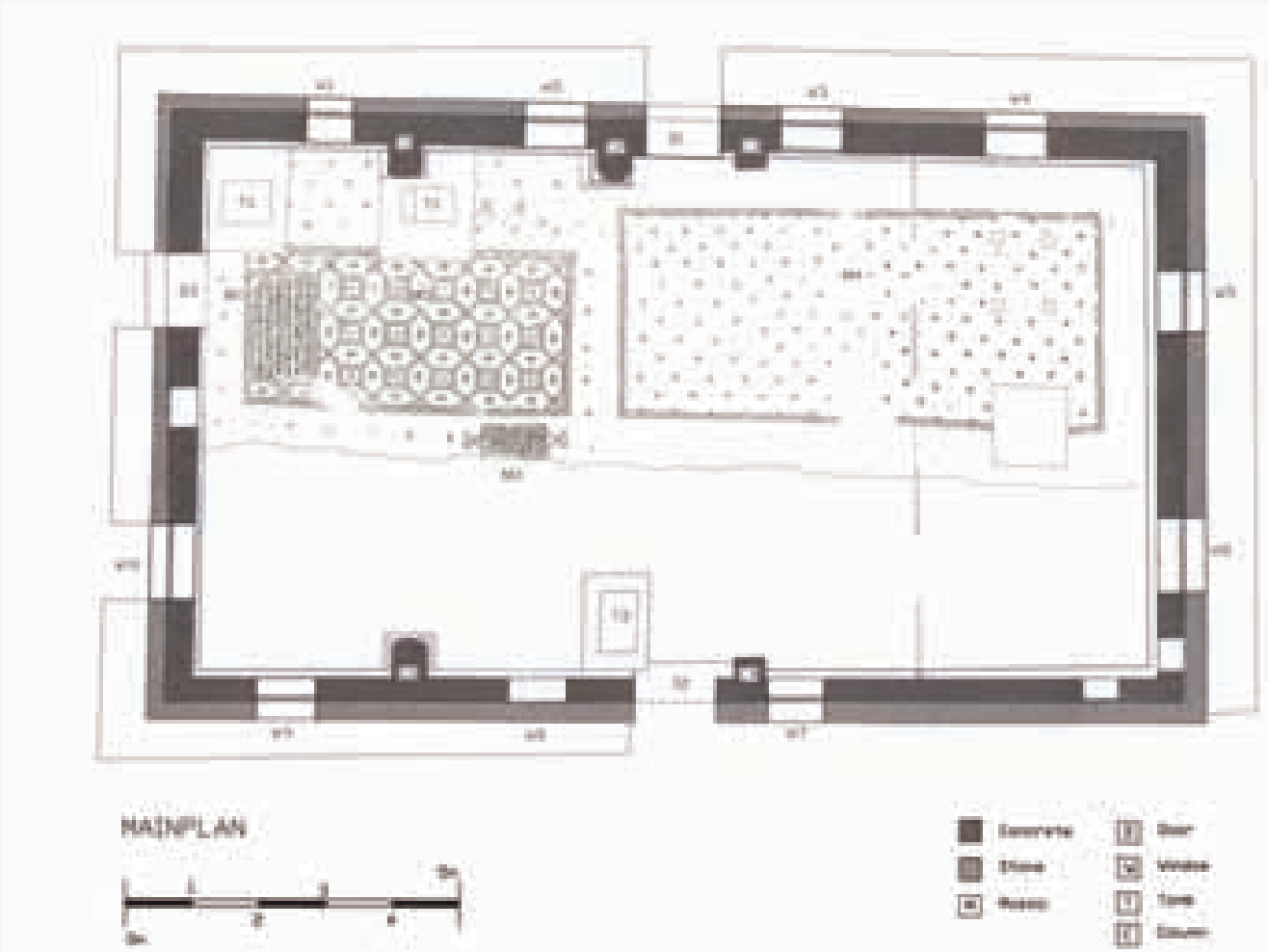
western entrance. At the moment only the northern part of the mosaic pavement remains and the southern part is disappeared.

Some old stones, belonging to the Byzantine church, have been reused in the building of the new church. They were maybe employed to build the four columns of the biggest northern room. During the recent conservation works carried out by the Bilad

al Sham project, we discovered that the four columns rested directly on the mosaic floor, while the foundations of the dividing walls of the five rooms were cut into the mosaics.

During the 1980s, after the construction of a southeast new building, the dividing walls of the main building were destroyed to convert it into a church. The ceilings of the rooms, built in traditional techniques and poor materials as in use locally during the 1930s, were demolished. The roof, leaned on the external and internal walls, should have been built in branches and canes with a casting of ground and mud.

Plan of main building



St. Andrew - the western entrance

The inner side of the building's walls are covered by cement plaster and their lower parts are coated with new stones that hide their characteristics. Through a small test, we checked the walls and discovered that they were built in traditional methods, with stones and lime as binding material. They were composed by an inner and an external wall divided by a casting of small stones, lime and ground.

When the owner decided to enlarge the surface of the church and to remove the internal walls there was no possibility to preserve the ceilings. They were replaced therefore by a concrete domed roof and one of the southern columns in the large room was moved further south. The destiny of the other column of the southern wall of the room is unknown. To carry out the work the original mosaic floor in the southern part of the building was destroyed and repaved with the same old tesserae but in a mediocre technique and assembled by cement. The most beautiful mosaic of the floor, in the northern side, was preserved.

St. Andrew internal view

Description of the mosaic floor

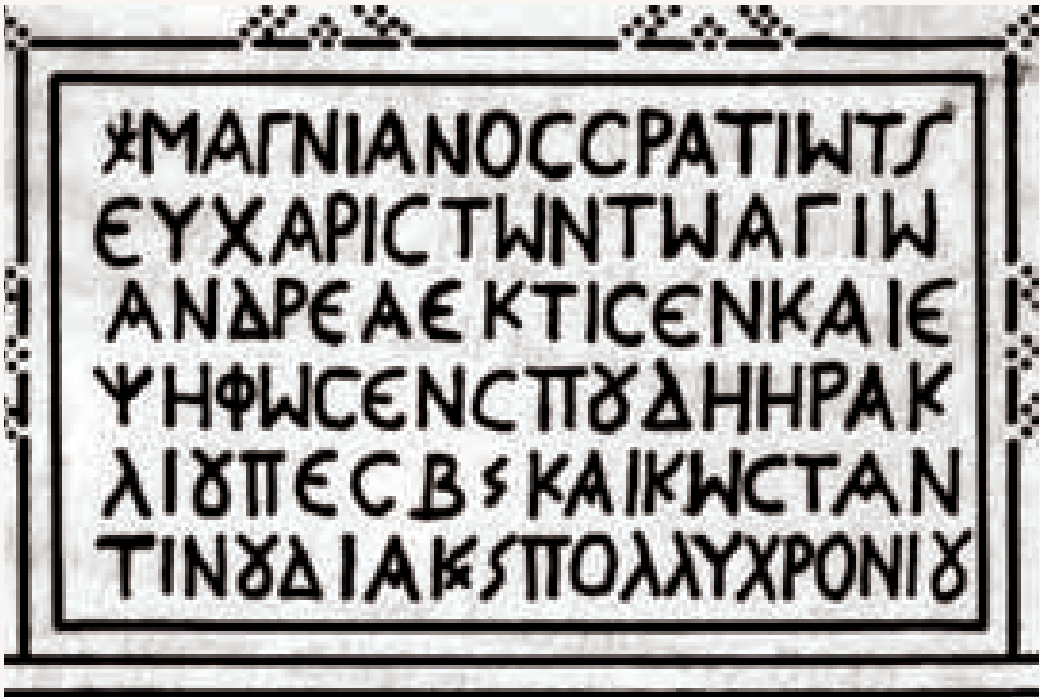
Detail of mosaic floor

Despite the mosaics in the Church of St. Andrew are among the few Byzantine mosaics in Jericho, and most important, among the very few bearing inscriptions dating the mosaic and the building, scholars dealing with Byzantine studies did not give special attention to them. The reason for this limited interest might derive from the fact that the decoration of the mosaic floor is very simple, but could also result from the absence of exhaustive archaeological study in the area.

At the moment only part of the mosaics studied and described by Otto Meinardus survives. The ancient church was probably built in a single nave. The surviving mosaic in the northern side is composed by two carpets, one in the northeast part and the second in the northwest part of the church.

The first carpet (7 x 3,06 m) is at the moment divided by a modern wooden iconostasis. It has a black and white frame and

Drawing of Dedicatory Inscription



an internal decoration of simple semis of nine black tesserae on white background.[5] It shows a density of 36 tesserae per 10 x 10 cm. The second carpet, in the northwest part of the floor, is 2,38 x 4,55 m. It is slightly smaller than the northeast one, so as not to interfere with the tombs. The westernmost part of the mosaic has an inscription of six lines. The carpet is decorated with an outlined orthogonal pattern of irregular octagons.[6] The number of tesserae in 10 x 10 cm. is 36, but in the inscription the black tesserae are smaller. In the southern part of the carpet, outside the frame, there is a ten lines inscription, with a number of tesserae of 72 in 10 x 10 cm. The colours of the tesserae are mostly black and white and there is a limited use of red tesserae in the funerary inscription.

The decorations of the mosaic floor of the Church of St. Andrew are very common in Palestine. In Jericho the same drawing is found in the mosaic floor of the left aisle in the Ain Duk (Na'aran) Synagogue and in the floor of the churches in Khirbet en Nitle and Khan Saliba.[7]

Dedicatory Inscription

Inscriptions of the mosaics

There are two inscriptions in the mosaic floor of the Church of St. Andrew. The first one is located in the western part of the floor, were there was probably the main entrance to the Byzantine church. It is composed by six lines with 10 cm high letters. The dimensions of its external frame are 1.05 x 1.66 m.[8]

The inscription has been translated by Father Augustinovic and reads as follows:

"Magnianos Stratiotes gives thanks to St. Andrew, he built and laid the mosaic under the provision of Heraclios the Presbyter and Constantinos the Deacon (and) Polychronios".[9]

In the inscription four persons are mentioned, three of whom are referred to with their respective profession. Magnianos the soldier, Heraclios, the presbyter and Constantinos the deacon. Polychronios, the fourth person, may be the artist who laid the mosaic.[10] In the area it is not the only case in which the artist left his signature.[11]

The funerary inscription, inserted in a 1.49 m. long decoration, is composed by ten lines, with 8 cm high letters,[12] in a frame of 0.93 x 0.49 m. The inscription reads as follows:

"Here reposeth the blessed Tryphon, Servant of Christ, who fell asleep on the 20th of the month of February, on the fifth day, Indiction Ten".[13]

The date in the inscription has been interpreted by Meinardus, who suggested that the blessed Tryphon died in the year 592 A.D., the only year of the 10th Indiction in the 6th century in which the 20th of February fell on a Tuesday (the fifth day).[14]

Funerary Inscription

Conservation activities in the mosaic floor

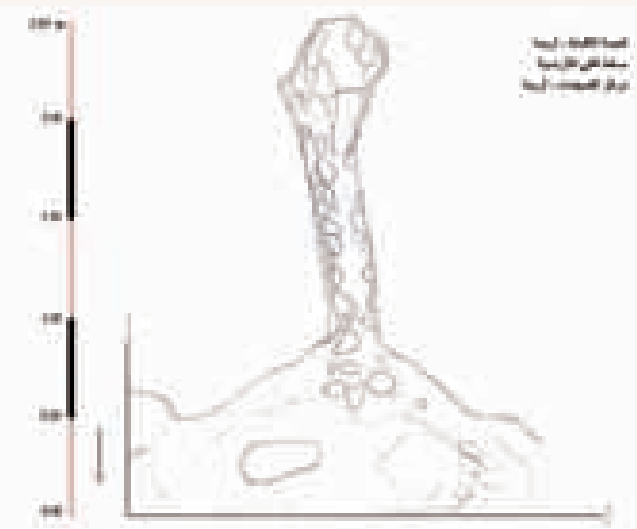
We have carried out conservation activities in the mosaic floor of the Church of St. Andrew already in 2005, during the previous training course of Bilad al Sham.[15] In the occasion of the training course of this year, carried out in cooperation with the Palestinian Ministry of Tourism and Antiquities, we have completed the work and organized the inauguration with the presence of the Vice Minister, Mr. Marwan Al Tubasi and the former Governor of Jericho, Dr. Sami Musallam.

Previous conservation activities

During our previous conservation activities in the church we have had the opportunities to study the mosaic floor, to review the few historical documents existing about the site and to check previous actions carried out in the past over the mosaic. The most important past activity was carried out during the 1980s, when, to create a single large hall, the dividing walls were demolished. The resulting lacunae in the mosaic floor were integrated reusing the tesserae of the floors of the other rooms. The action was carried out in the area west of the iconostasis, with a mediocre technique and incompatible materials. Minor integrations were also carried out, but in smaller areas in the eastern side behind the iconostasis, where the small columns of the altar were positioned.

The mosaic floor has also been grouted with white cement mortar in the past. The action was carried out to fill the empty spaces among tesserae trying to consolidate the floor and the mortar was not cleaned after the use. The floor was as well painted with a layer of transparent varnish with the aim of protecting it and makes it brighter. The action altered the original colour of the tesserae, especially the white ones.

Drawing of lacuna in the mosaic floor



Conservation activities carried out during the monthly Bilad Al Sham training course in 2005 were more carefully conducted by the Mosaic Centre Jericho, Committee for the Promotion of Tourism in the Governorate of Jericho. The activity was based on the documents prepared in 2002 by architect Osama Hamdan, expert in conservation, and by art historian Carla Benelli.

The problems and degradations of the mosaic floor were deeply studied and the staff prepared a series of thematic charts about the condition survey. Some thematic charts documented all the conservation activities carried out during the yard.

Conservation works started in the western part of the pavement, in the panel near the old entrance. We removed the cement from the surface in mechanical way and the varnish was cleaned up through mechanical and chemical methods.

Cleaning test

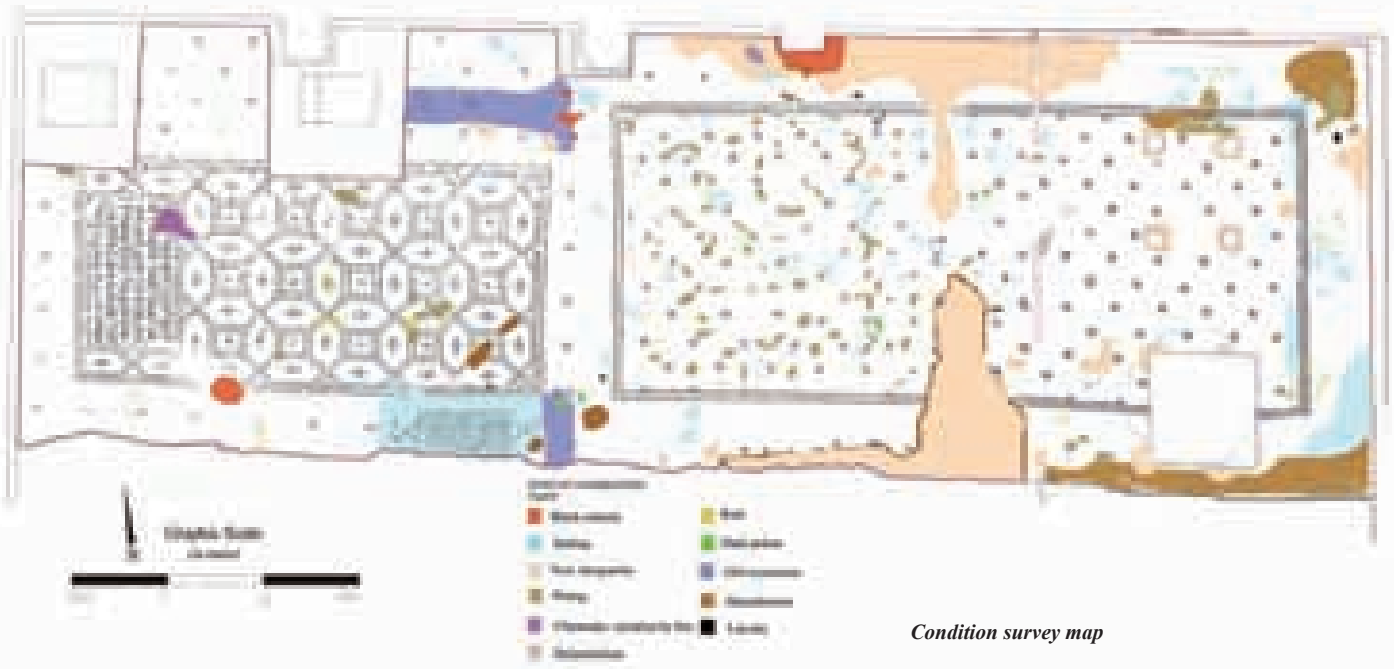
During conservation work in 2005

White cement over the mosaic surface

Conservation survey, problems and degradations in the mosaic floor of the Church of St. Andrew

The mosaic floor is inside the church, covered and protected by the new building from weather condition. Despite the protection, the mosaic floor was suffering from various problems. The majority of the problems were arising from chemical and physical elements, which altered the natural composition of the constituent materials.[16]

Other degradations derived from human activities and from the conservation activities carried out in the 1980s without scientific approach and compatible materials, which had a negative impact over the conservation of the mosaic.



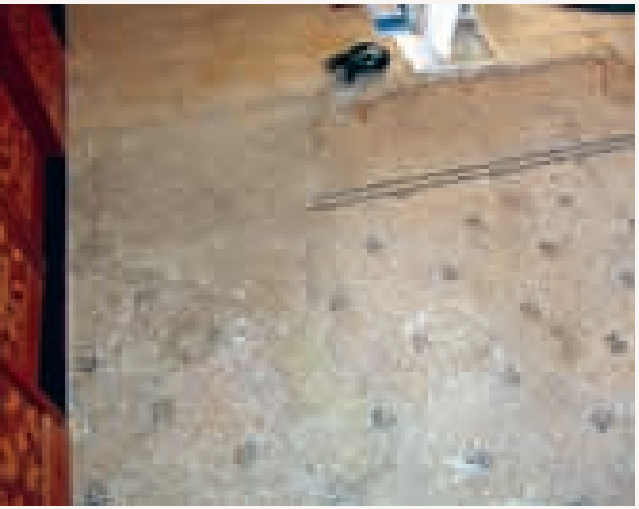
Condition survey map

Among the problems we observed:

- huge quantity of white cement was covering the floor surface. The cement was applied in the past to fill the empty spaces among tesserae and was not cleaned after the use. The layer of white cement was very hard and was one of the most difficult residue to remove;
- the colour of the tesserae was altered by a layer of transparent varnish which was painted over the floor in the past with the aim of protecting it and makes it brighter.
- There were residues of black cement over the tesserae. They derived from the conservation activities carried out in the 1980s to fix some tesserae.
- The cement used to pave the western part of the church

Black cement intervention

Condition survey map



Past intervention with incompatible materials

reached the edge of the original mosaic floor. The cement is a stiff material, and a physical barrier. It does not allow the natural adaptation of the mosaic floor and therefore generates swellings in some parts. There are two types of swellings; the first is a vast hole and the tesserae are completely detached from the bedding, while the second is composed by small cavities shaped as cells into the bedding mortar. This event results from the alteration in volume of the different components of the bedding layers caused by humidity or change in temperature.[17]

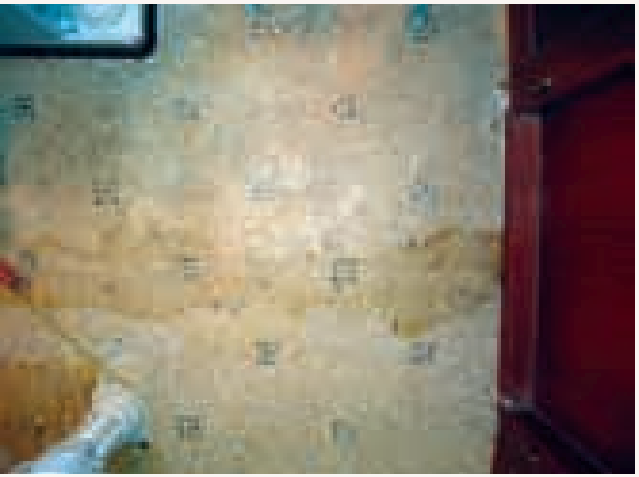
- The lacunae in the area of the foundations of the dividing walls, near the tomb openings, the iconostasis and the columns of the altars were filled in the past with mosaic tesserae using black cement as bidding material. The action was carried out in improper way and had a negative impact on the aesthetic of the floor.

Condition survey map

- There were many loose tesserae, especially in the edges of the mosaic floor.
- Many tesserae were detached from the bedding mortar.
- Some tesserae were fragmented and deteriorated, especially the black ones. The chemical composition of the rock that composes the black tesserae is indeed particularly weak and subject to mechanical alteration caused by temperature change.[18]
- In the area beyond the iconostasis we found glue residues because a carpet was attached over the mosaic floor in the past to

Cement pavement near the mosaic floor

Deteriorated black mosaic tesserae



Glue residues

Salt over the surface

protect it. The glue altered the colour of the tesserae, especially the white ones, which absorbed the chemical elements of the glue and became yellow. The glue generated an insulating layer over the mosaic and caused further problems to tesserae.

- There were rust stains over the mosaic. They were small and difficult to notice without a careful analysis of the surface. The problem was probably caused by a protracted placement over the floor of metallic elements, which rusted when the floor was washed. The humidity caused the oxidation of the metal and the rust stained the mosaic.
- Some areas of the mosaic floor were affected by different forms of depression, due to two factors: the first one was the general weakness of the bedding layers and the second was the result of loading or collapse of heavy objects over the mosaic floor.
- When we removed the carpet inside the area closed by the iconostasis, we found a lot of salt over the floor, especially in the northeast corner. It was probably caused by water infiltrations from the outside through the walls or by lack of adequate ventilation.
- In the same northeast corner, the owner of the site tried in the past to consolidate a 20 cm square area of floor. They put some cotton in a swelling after removing some tesserae. We found the cotton soaked with water.
- The beauty of the floor was altered by lacunae filled and integrated with black cement mortar.
- Some scratches were found over the floor surface. They were probably made by a grinder or other cutting devices used without care over the mosaic.

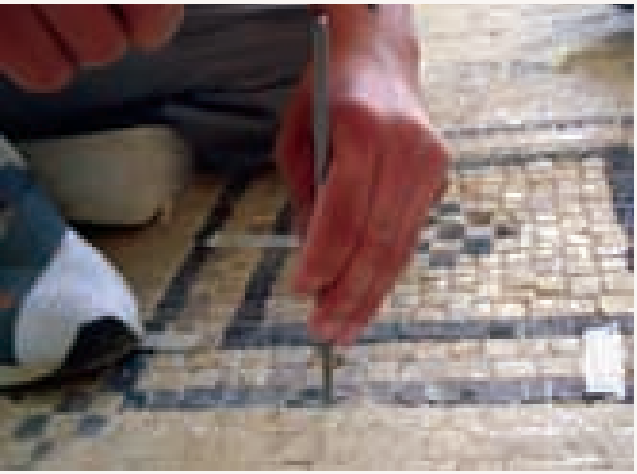
Conservation work

Conservation works during our last phase of the project, as we have already expressed, were intended to complete the previous activity carried out in 2005, which included studies and plans of interventions. During the last phase we finalized the condition survey including the area beyond the iconostasis through photographic documentations, drawings and maps and then we prepared the thematic charts and studied the intervention to carry out.

The following conservation works were carried out:

Manual mechanical cleaning

Intervention map



Manual mechanical cleaning

Cleaning

During this phase we continued to clean the mosaic floor, as in the previous phase. At the beginning we carried out some tests about different ways to clean both the white cement and the varnish using mechanical or chemical methods.[19] This operation is one of the most important actions to preserve and maintain mosaic floors. The intervention aims to remove all the extraneous inappropriate deposits over the surface of the mosaic, which influence its preservation and obscure its characteristic and beauty.[20]

The operation started brushing up the mosaic floor with water to remove the dirt and decrease the hardship of the cement layer. Then we began to remove the white cement from the floor

During conservation work

using the manual mechanical method (hammer and chisel). The intervention was painful because the cement was hard and the tesserae, especially the black ones, were very fragile. The action has to be carried out with special attention, care and patience. We could not use blades as usual, because of the hardship of the cement layer. We were obliged to use a vibrating cutter.

This action was the most time-consuming activity of the work. To remove the varnish we used the mechanical method with the blades and the yellow glue was taken away from the

Mechanical cleaning

Mechanical cleaning

Mechanical cleaning

During conservation work

floor through chemical cleaning with thinner. The cleaned areas were afterwards carefully deterged with brush and water and then dried so that no chemical residues remained over the mosaic surface.

During conservation work

Consolidation

The reason to consolidate the mosaic floor is to improve the mechanical endurance of the degraded materials.[21] This kind of action increases also the chemical resistance of the materials. Some pre-consolidation activities were carried out before the cleaning, in the mosaic areas that were too fragile to afford the use of mechanical devices. Consolidation is used also to correct swellings.[22] We used *Primal* [23] and water at a dilution rate of 7-10 percent water, to consolidate the various layers of bedding by injections. In some areas we prepared a semi-liquid mix composed by hydraulic lime, stone powder and marble powder at 1:1:1, together with water and *Primal* at a dilution rate of 7-10 percent water.

Consolidation of swelled areas

Consolidation by injection

Fixing swelled areas

To repair the small swellings we produced a 3-millimetre diameter hole in the exact centre of it with a drill, then we cleaned the hole with water sprinkled inside with a syringe to remove all the internal filth, and finally we filled the hole with *Primal* and water at a dilution rate of 7 percent water.

To repair the large swellings, able to absorb the semi-liquid mortar, we delimited the edges of the swelling, fixed the entire area of the damaged mosaic with gauze and *Paraloid B72* [24] until it dried completely. To consolidate the area, we removed from four to six mosaic tesserae (numbered to facilitate putting them back in place). After cleaning the hole under the mosaic with a vacuum cleaner and removing the degraded mortar, we injected

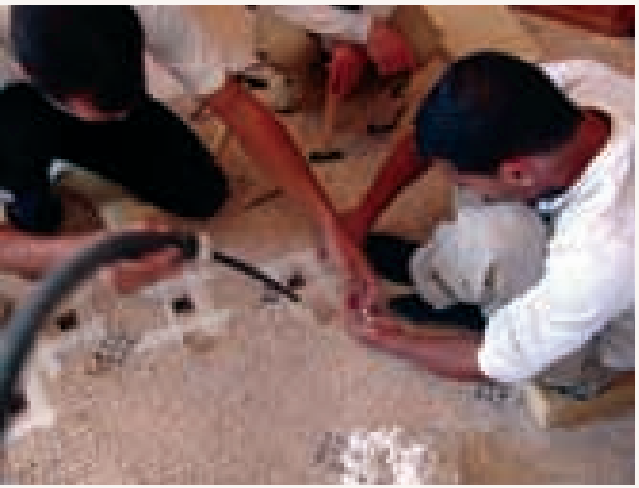
During conservation work

inside some water to moisten the area and then the mortar mix, taking care of moving it inside the hole to be sure that it filled the entire space. The filling is carried out in small stages. Each stage should not exceed 2 cm. of layer to avoid that its thickness does not lower too much when it dries. Then the tesserae are put back in place, the gauze is removed by alcohol and the area is deterged with water and brush.

We consolidated also fractured tesserae by injections of *Primal* and water at a dilution rate of 10 percent water. The operation was carried out after cleaning the mosaic floor first with the vacuum cleaner, soon after with simple water and then with *Primal* and water. Minutes later we washed again the floor to remove all chemical residues.

Consolidation by injection

During conservation work



Fixing swelled areas

To solve the problem of loose tesserae, we carried out two interventions, depending on the degradation's level. In the case of minor degradation, the area was cleaned with water, taking care that the water reached the bedding. Then we consolidate the tesserae with *Primal* and water at a dilution rate of 10 percent water. The spaces around the tesserae were then filled with milk of lime diluted with water and darkened with soil, and in case of bigger gaps, we added quartz powder. The area was then cleaned with water.

In case of major degradation, we numbered and removed the loose tesserae, prepared a new bed and put the tesserae back in the original place with lime mortar.

Fixing area of past integrations

Integration of lacunae

We worked in the lacunae of the mosaic floor that in the past were repaired with black cement or filled with tesserae in improper way. We removed the incompatible materials (cements or tesserae) after having fixed the edges of the lacunae with scotch-tape or gauze and *Paraloid B72*. New tesserae were then placed to fill the lacunae with lime mortar. To point out the new integrations in the ancient mosaic, we placed the tesserae under level.

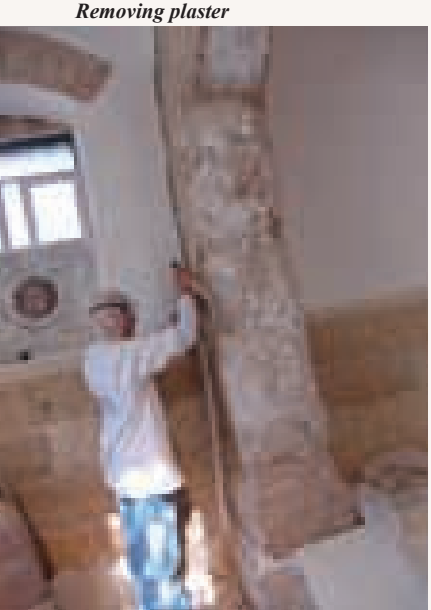
Rusty stains

Rusty stains covered only small areas of the mosaic floor and at superficial level. To remove them it was enough the use of blades.

Integration

Drawing of column after plaster removal

Removing plaster



Uncovering and conservation of columns

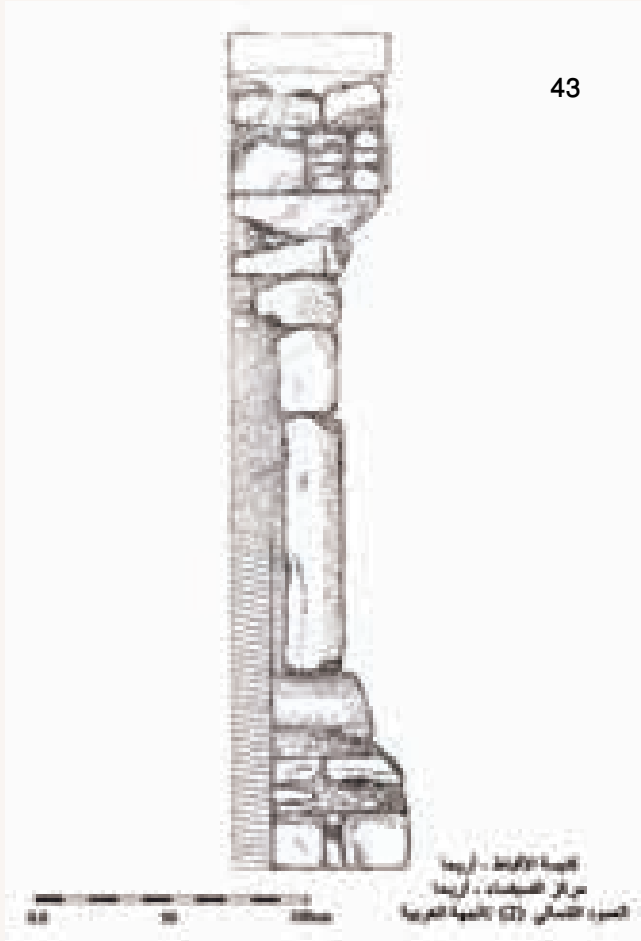
During the project we worked also over the columns inside the church. The action allowed us to better understand the history of the site and to improve its beauty, because the columns were covered and plastered with cement.

Before the intervention we carried out a conservation survey, then we removed the plaster from the stones of the columns in mechanical way. The columns were built with fragile sandstones, and belonged probably to the original Byzantine building. We consolidated their weaker parts and made their joints with lime plaster.

In November 2007, in the same site, a training course for the students of the diploma course in maintenance and conservation of the Al Quds University was held. The training course, supported by the Italian association CISS, was carried out by the Mosaic Centre Jericho, under the supervision of conservators Raed Khalil and Rasmi Al Shaer. During the training, the conservation work of the mosaic floor and the intervention over the columns inside the church were completed.

The course lasted 45 days and was attended by following trainees:

- Iusra Aref
- Fatin Al Ueishe
- Ahmad Khalil
- Hasan Rawashde
- Issa Yusef
- Hamed Maharqa
- Uala' Ghazal
- Basim Abu Sheikh
- Zeinab Taqruri



Drawing of column after plaster removal

Internal view after plaster removal

Preparing joints

The Church of Saints Lot and Procopius at Kh. Al-Mukhayyat - Jordan

Historical background[25]

The little apsed church (16.25 m x 8.65 m) on the acropolis, which was identified in 1913, was built at the time of Bishop John of Madaba, in the middle of the 6th century A.D.

The floor mosaic of the church was discovered when a family built a house on the acropolis of Khirbet al Mukhayyat. In 1935 the Custody of the Holy Land, after the purchase of the area, decided to protect the precious monument and built a house in stone and reinforced concrete over the mosaic.

The mosaic floor has been studied by Franciscans archaeologists S. Saller and B. Bagatti, who published the results in the book "The Town of Nebo" in 1949.

Mosaic description

Two sheep facing a tree decorate the elevated presbyterium, and traces of two birds are still visible at the side of the altar. In the nave, along the step, runs a long dedicatory inscription that gives the title of the church.

The central nave is divided into two separate panels, each enclosed in a double ribbon with bows imitating a carpet. The eastern panel is decorated with hunting, pastoral, and wine-making scenes, all enclosed in twenty volutes of vines arranged in six

Intercolumnar panel with two geese

Presbyterium

Intercolumnar panel with Nilotic motif

rows of four scrolls each. The four vines proceed from the four corners of the field, each from a clump of acanthus leaves.

The western panel is decorated with four fruit-laden trees placed in the four corners and meeting in the center. Pairs of animals facing each other are found among them. Among the animals are two bulls facing an altar. Five intercolumnar panels have nilotic motifs, including a church between a fisherman and a boatman who carries amphorae; two fantastic animals facing a papyrus plant on which a duck is nestling; two geese on either side of a plant; aquatic animals and flowers; and two gazelles facing a tree. The eastern edge of the southern aisle is decorated with a grid filled with leaves; two partridges face a vase.

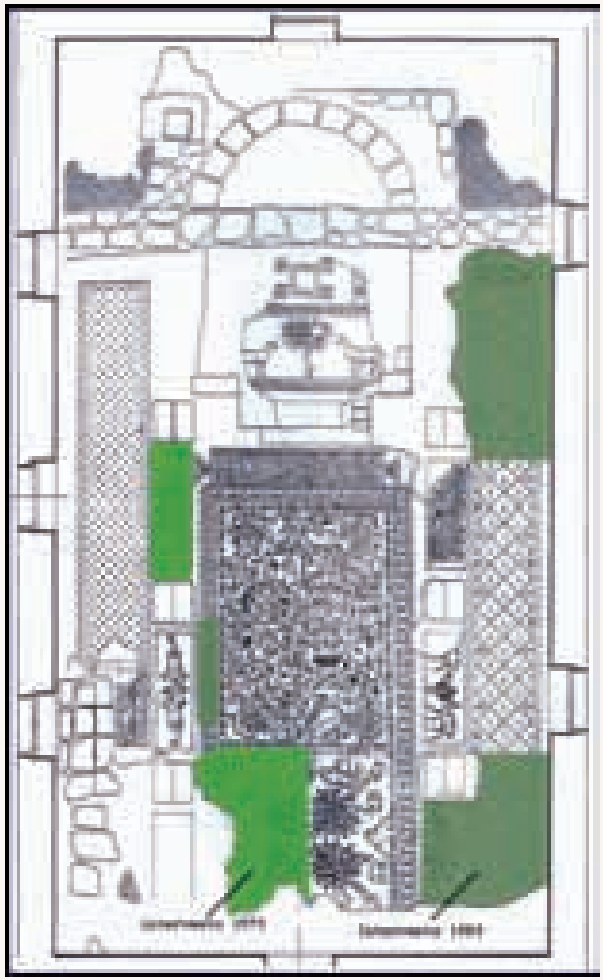
Wine-making scene in the central nave

Past Interventions of Conservation

During the training course carried out in the site of the Church of Saints Lot and Procopius at Kh. Al-Mukhayyat close attention has been paid to the study of previous preservation activities, because it is a crucial stage before the implementation of any action.

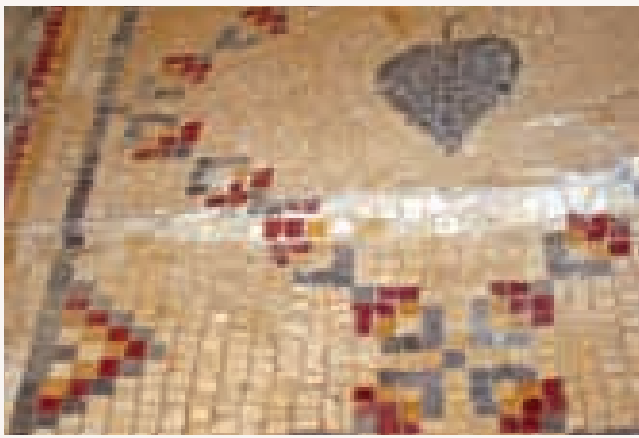
In 1935, immediately after the purchase of the land by the Custody of the Holy Land, a first activity to preserve the mosaic was conducted and the house built over the mosaic floor served as shelter.

It is important to point out that this shelter was the first one to be built in Jordan to preserve a monument.



Map of previous interventions in 1973 and 1983

Swelling in the central nave



Detail of joint between the in situ mosaic and a relaid panel

Putting gauze over swellings

Conservation activities during the 1970s

During the war, the monument was entrusted to the former owners, who used it as house, causing serious damages to the mosaic floor. In 1973 there was a first intervention of conservation, to stop the major swellings under the supervision of Franciscan Fathers Bellarmino Bagatti and Michele Piccirillo.[26]

In that period, the following activities were carried out:

- Photographic and graphic documentation of the mosaic floor
- Cleaning with water
- The most damaged parts (the north intercolumnar of the fisherman and the boater and the two trees in the northern side of the Paradise view) were lifted, re-laid over a new bed and put back *in situ*.
- The surface of the floor was covered by a wax layer.

Cement removal from surface with chisel and scalpel

- The roof of the building was waterproofed and new drainpipes were set, and the windows were rebuilt. The entrance in the northern wall was fixed and a wooden raised pathway, closed by an iron fence, was positioned over the left lateral aisle. A new house for the keeper was built nearby.

According to modern theories of conservation, the lifting of mosaics from the original bedding, which was a common practice in the past, should be avoided because it is an inadequate method to preserve mosaics. There are situations even now however, in which it is the only possible action to safe the heritage from disappearance.

Conservation activities during the 1980s

In 1983, other swelled sections were lifted and re-laid: the eastern side with the inscription in the southern aisle and the intercolumnar with the two geese.[27]

Conservation activities during the 1990s

In 1993 the inexorable swelling of the mosaic affected the two scrolls with the hunter who hits the lion in the western side of the central panel. A first precautionary intervention was carried out under the supervision of conservator Livia Alberti in 1994, putting gauze over the surface.

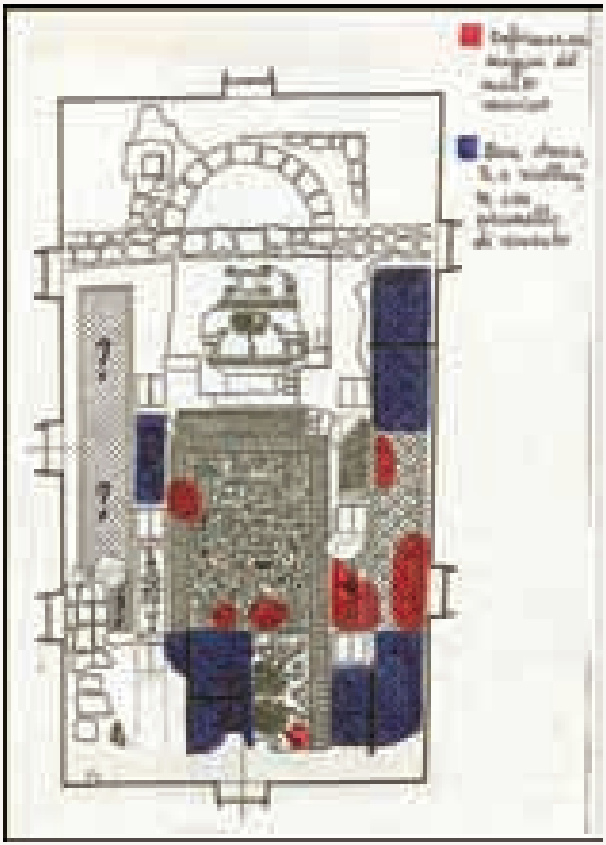
The work carried out at that time is very important because the conservator operated a thorough analysis tying to understand the causes of the swellings. Her studies are documented in a report and were studied by our staff before the intervention.[28] Her suggestions concerning the cause of the damage were:

- The impact of moisture: The presence of damaging moisture

Preparing the mosaic lifting

During mosaic lifting

Preparing the mosaic lifting



Condition survey map prepared in 1994

was evident in the southern wall of the building. There were salts on the surface of the mosaic;

- The temperature inside the building was not significantly high and the windows were closed, and this was unlikely the reason for the expansion of the mosaics. It was also noted that the expansion was not seasonally, but occurred in a long period of time;
- the pressures and effects of the mechanical strength over the mosaic floor was believed to be caused by ground movement or to derive from the lateral walls of the building, because the swellings were longitudinal.

In her report the conservator suggested some interventions to better understand the phenomenon and address the problem. It is interesting to point out that the suggested actions were not directed over the mosaic surface, but were mostly external interventions with direct influence over the mosaic floor. She suggested:

- To carry out isolation work along the southern and western walls to reduce the effect of rainwater.
- To study the condition of the existing wells, one inside the building in the northeast corner and the other outside the building.
- To check the cracks found in the concrete beam of the roof.
- To study carefully the swellings and their depth, and to prepare maps about the lifted and re-laid pieces.
- To remove the cement along the edges and replace them with less rigid material.

In 1997, there was an intervention by the "Opificio delle Pietre Dure of Florence» under the supervision of conservator Giancarlo Raddi, as training for the Madaba Mosaic School.

The session lasted three weeks, and concentrated on the problems resulting from the interventions made between the years

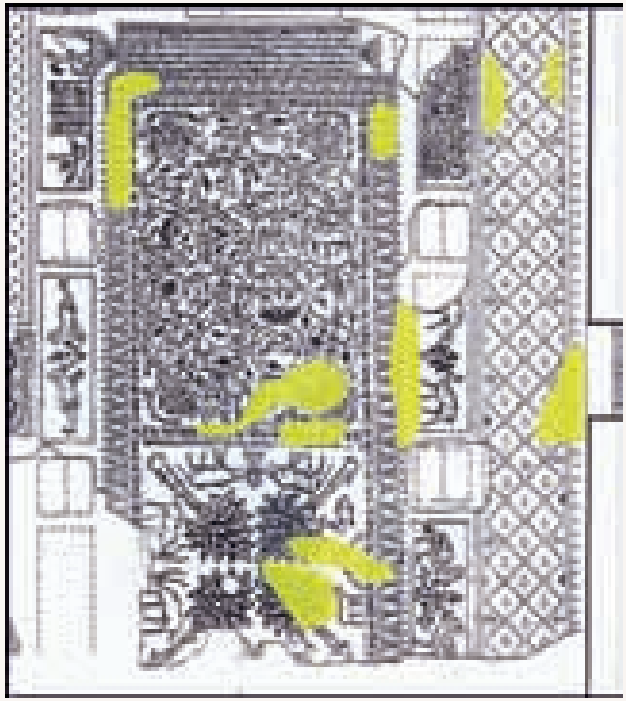
Just after lifting

1973-1983, during which the use of cement had reduced the mosaic floor's motion.[29]

The intervention concerned the relief 1:1 of the mosaic, the removal of the cement put as protection of the mosaic's edges in 1935, the pre-consolidation with water and *Primal*, the fixing of the edges and of the lacunae by lime and sand. The swelling of the hunter and of the geometric drawing near the southern aisle was consolidated with mortar, water and *Primal*.

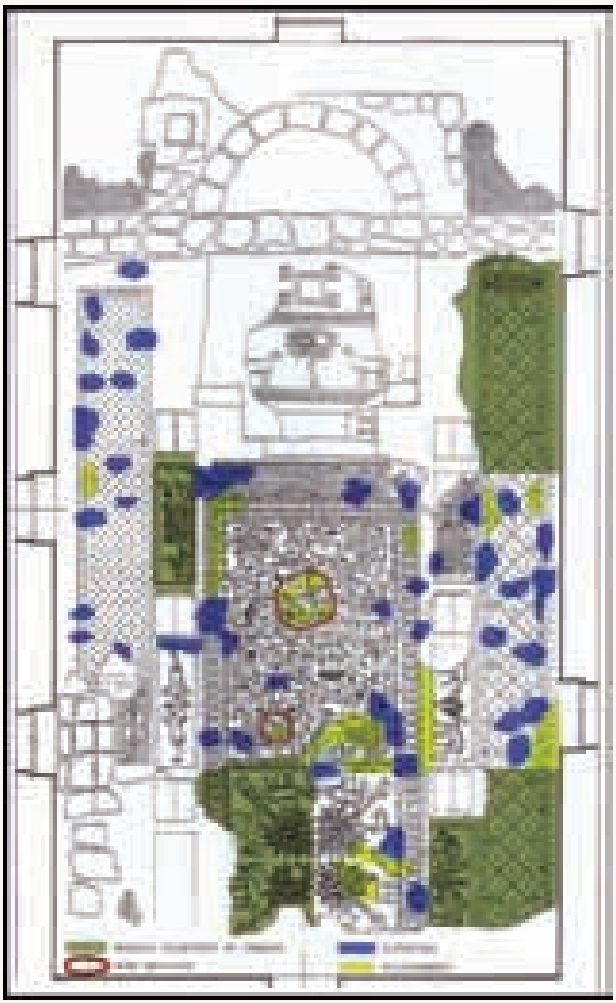
Conservation activities in 2002

Five years after the last intervention, it was evident that the degradation persisted and that the mosaic condition had worsened. In the period 2002-2003, under the auspices of the Bilad al Sham project and supervision of conservator Franco Sciorilli, the team of trainees carried out some maintenance works to tackle the problems of salt and swellings, to remove the cement edges and to prepare a map of the location of swellings over the mosaic floor.[30]



Map of major swellings in 2002

Removing cement from the back of a mosaic panel lifted in the past

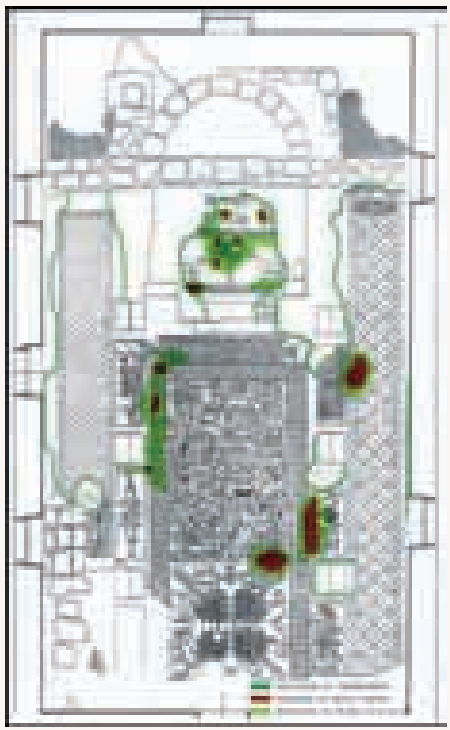


2002 Condition survey map

It could be point out that the problem of swellings continued throughout the years, in spite of several interventions carried out to stop the damage that had no success.

In 2002, during the Bilad al Sham training course, we compared the new swellings' location map with the previous map prepared by conservator Livia Alberti and we noticed that while in the past the swellings had a longitudinal direction along the church's eastern-western walls, in 2002 they were cross-sectional, along the north-south direction. We also noticed that almost all the swellings occurred near the areas that had been lifted and re-laid over cement in the past.

Since 2002-2006 mosaic floor was put under surveillance, and simple interventions to mitigate the damage and stabilize the ground was carried out, but without success



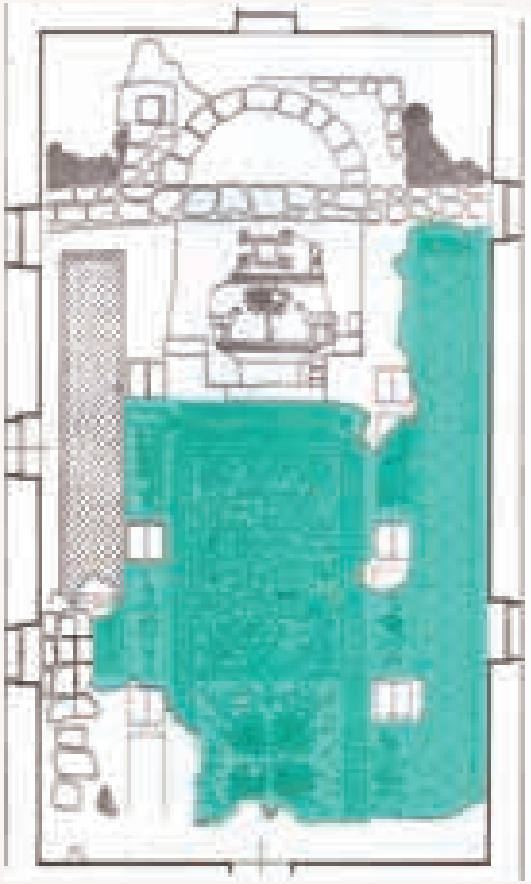
2002 Intervention map

Intervention of Conservation

At the beginning of the Bilad Al Sham training course project we realize that the situation of the mosaic floor was kept on worsening and after a discussion with the scientific supervisor of the project, we decided to include the mosaic floor in the conservation activities of the project.

Condition survey

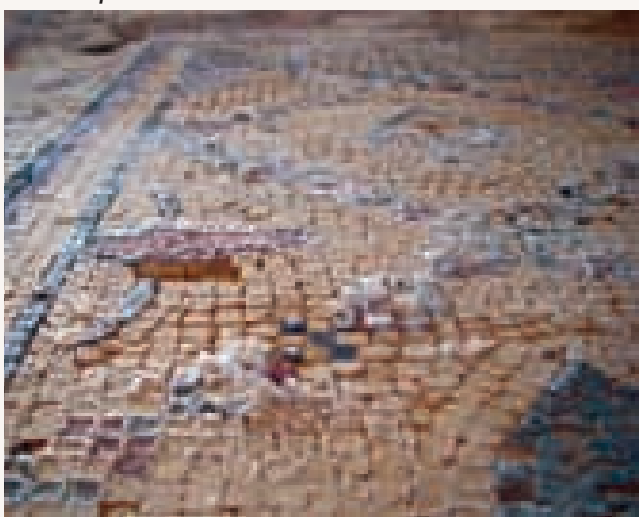
The floor mosaic of the Church of Saints Lot and Procopius was in severe condition of decaying and affected by swellings and depressions, deteriorated and loose tesserae, cement residues over the mosaic and among the tesserae, incrustations and wax over the surface, color alteration by fire damage.



2006 Intervention map

Cleaning the back of lifted mosaic

Presence of salt



Preparing the bedding of the mosaic

Among the various problems of the mosaic there were also the consequences of previous interventions of conservation, which could not stop the degradation, and of the new bedding layer in cement of the central nave, which produced swellings and depressions in the central area. Serious problems were caused by capillary humidity.

The seriousness of the mosaic degradation obliged us to lift the floor from the existing bed and to re-laid it on a new support. A difficult and drastic choice, which seemed to be the only and ultimate option in front of our powerlessness to stop the mosaic decaying in an alternative way.

Cleaning the back of mosaic

Conservation activity

Cleaning

The first action carried out on the mosaic floor has been the cleaning of the entire surface by sponges, small brushes, buckets, scalpels, chisels, cotton, and hammers, using water and paint remover. The operation has been carried out first by water and brush, drying the wet surface with sponges, then cleaning the surface with cotton and chemical cleaning solvent to take out the wax. Chisel has been used, together with water, to remove incrustations. All the activities were documented over the map of the floor mosaic.

Preparing the bedding of the mosaic

Preparing the foundation to relaid the mosaic

Preparing the foundation to relaid the mosaic

Preparing the foundation to relaid the mosaic

Pre-consolidation

A fixative, the *Paraloid*, diluted in thinner at 7,5%, was used to fix the fractured tesserae. The action was carried out cleaning the surface with cotton and solvent, and then brushing tesserae with diluted *Paraloid* until it penetrates and consolidates the mosaic tessarae. The solvent was rubbed twice to clean fully the surface. Deteriorated tesserae were primarily the black and yellow tesserae.

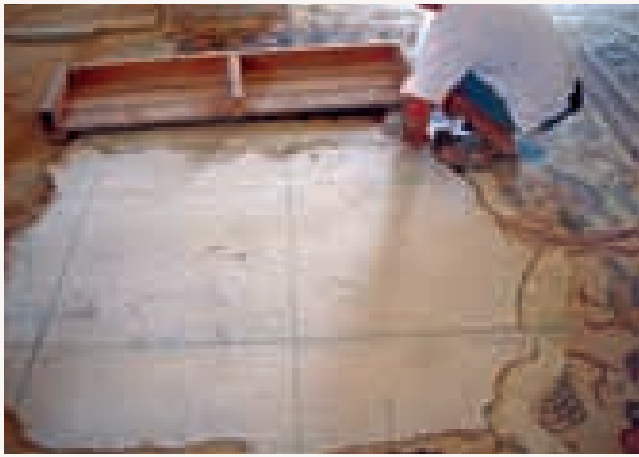
Preparation for the mosaic lifting

After the consolidation of the tesserae, the treated areas were highlighted in the map so to put special attention during the lifting. The entire floor mosaic has been drawn on a scale of 1:1 over a plastic sheet and later divided into pieces, taking into consider-

Relaying the mosaic

ation carefully the drawings and decorations to avoid cutting the motifs in an improper way, but following the external lines of the figures. Afterwards textiles were glued over the various pieces of mosaic spreading by brush animal glue diluted with water at 50%. Two kind of textiles were used, a lighter one directly over the mosaic, and a thicker one over the former. The action was carried out in two days. The first day the light layer was unfolded over the mosaic. The second day, when the light textile layer was dried and perfectly glued over the mosaic, the thicker layer was attached over it. The exceeding textile was accurately cut off. The more fragile areas of the mosaic, which were affected by swellings and degradation of tesserae, had been specially treated. They have been covered first by gauze, which was light enough to let the glue penetrate thoroughly closing all the voids. Before the lifting, all measures and levels were taken, to avoid future problems in the action of *in situ* re-laying.

Relaying the mosaic

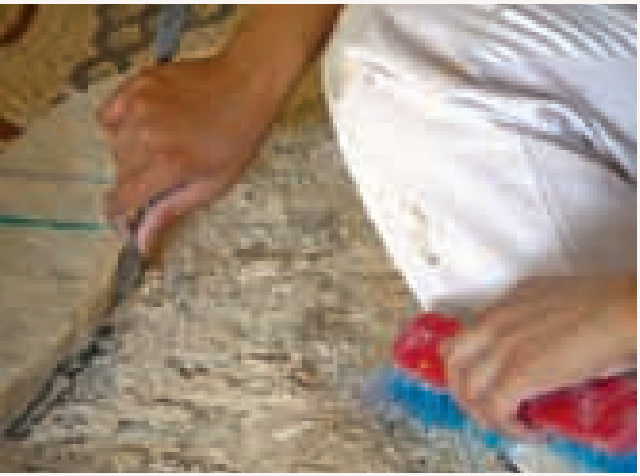


Relaying the mosaic

Relaying the mosaic

Relaying the mosaic

Preparing the foundation to relaid the mosaic



Preparing the foundation to relaid the mosaic

Removing the textile after the relaying of the mosaic

Lifting

The lifting was carried out using big chisels, hammers, metallic pincers and grinders. All the mosaic pieces were numbered and numbers were marked in the mosaic map. The pieces located over cement supports were lifted first, followed by all the other pieces. Mosaic pieces were located upside-down over wooden board after the lifting, in order to facilitate the cleaning of their back, by chisel and hammer. The lifting of the pieces that were re-laid in the past over cement support was quite difficult and complicated by the metal bars inside the support. We carefully removed the metal bars by grinder, without damaging the mosaic.

Fixing the relaid mosaic

Removing the textile after the relaying of the mosaic

Relaying of the mosaic floor

The team cleaned the back of the mosaics that were laid over cement supports in 1973-74. Afterwards they realized a new bedding layer to re-laid the entire floor mosaic with cement and inert materials, covered in the surface by cold liquid asphalt to prevent problems caused by capillary humidity. The relaying of the mosaic was carried out by hydraulic mortar. The textiles over the mosaics, used to lift them, were then removed and the surface has been cleaned carefully through various washes with pure water. Finally the joints among the sections were closed with original tesserae.

We carried out also some actions for the rehabilitation of the area outside the building. Inside, we removed the plaster over the internal walls, cleaned the stones and repaired the joints. We also fixed the crack in the plaster beam of the roof.

Fixing the mosaic floor after relaying

Fixing the mosaic floor after relaying


EWN

Mosaics from a tomb in Aphamea - Syria

Historical background

The mosaics were discovered in a Roman tomb, 500 meters out from the walls of Aphamea, in 1997. The tomb was divided into three rooms: the first room was paved by a 2,15 x 2,47 m. white mosaic with a circle in the middle.

The second room had a 4,00 x 2,40 m. decorated mosaic with three personifications in the middle, each 68 x 85 cm. The first one was bordered by fishes and other sea animals. It represents the Ocean that encircles the earth. The second personification represents a woman crowned by fruits and leaves. Under it, a Greek inscription identifies it as Earth. The third personification is also crowned and it is in front of a circle. A Greek inscription identifies it as Time.

The third room was decorated just on the walls. The mosaics probably date to the 4/5th century AD.

Partly stolen and rescued by the authorities, the mosaics were in a very poor condition. They had been stored in Damascus, in the Department of Antiquities, in less than ideal condition.[31]

Condition survey

The Syrian General Department of Antiquities and Museums, worried for the safeguard of the mosaics after some parts were stolen from the tomb, had in the past proceeded to the lifting from the original ground, gluing a cotton canvas over the mosaics and enrolling them.

The condition of the mosaic before the intervention

The "Three Personifications mosaic" before last intervention

Preparing the assembling of the mosaic

The lifted mosaics were suffering from the following problems:

- Tesserae decay, due to the trauma of the lifting from the original site. Black and yellow tesserae were also affected by decay because of their weaker composition, while the red ones suffered from chromatic alteration
- The surface was covered by a hard concretion
- The surface was covered by a yellow layer, remains of the glue used to lift the mosaics and by the humidity during storage
- There was a black layer of dirt and dust between tesserae
- Many tesserae went lost due to the lifting and bad storage condition.

Cleaning after assembling the mosaic

In view of the previous phases of the training course, carried out during the summers of 2003 and 2005, the mosaics were transferred from Damascus to the Shahba Museum.[32]

For the trainees it was a very good opportunity to work on mosaics in such bad condition. They could experience the work on mosaics lifted from their original site and not re-laid over a solid bedding layer.

Works carried out in the first and second phase

Seting of compatible mortar

Preparing the assembling of the mosaic

Closing joints after assembling

During the first training course the team carried out a complete condition survey. Then mosaics were mechanically and chemically cleaned over the surface and residues of mortar and sand were taken off from the back. Trainees carried out work of consolidation of tesserae, and then cut the mosaics in smaller numbered sections. The mosaic floor of the first room was divided in seven pieces and the second, the one decorated with the "Three Personifications", was divided in eleven pieces. The two stolen and recovered pieces were rejoined to the mosaics. Then trainees re-laid the sections over honeycomb panels fixing them by compatible mortar.[33]

In the second training course the cotton canvas, which was glued on the surface of the mosaic was removed. It was a difficult task because very strong glue had been used to carry out the lifting of the mosaic floors. To complete the operation, we have to use a chemical product. The surface was then cleaned by water

Preparing the assembling of the mosaic

and brushes, to wash out all residues of chemical materials. The cleaning phase was completed with manual mechanical tools, to take out light concretions. We noticed that some tesserae were very fragile and during the cleaning, consolidation works were carried out over loose tesserae and along the edges. At the end of the second training course the various sections of mosaics were reassembled together, leaving blank spaces around every piece, to facilitate the operation of assembling and the pieces were prepared to be fixed together in the last phase.[34]

Intervention during the 2007 phase.

The last training course concentrated in the assembling of all the mosaic pieces of the two floors. The two floors were therefore made up joining the various pieces and integrating the lacunae and the blank spaces. Lacunae were filled by mortar composed by materials and color compatible with the original. At the end the two mosaic floors were set to be exhibited in a museum.

Completing the intervervention

Preparing the assembling of the mosaic

THE NOTES:

1- O. Hamdan – C. Benelli, 2005
2- A. Augustinovic, 1951: 77; O. Meinardus, 1966: 181; C. Benelli, 2003: 62-69
3- A. Augustinovic, 1951: 77
4- O. Meinardus, 1966: 181
5- C. Benelli 2003: 65; C. Balmelle, and others 1985: pl. 113
6- C. Benelli 2003: 65; C. Balmelle, and others 1985: pl. 169b
7- C. Benelli 2003: 65
8- C. Benelli 2003: 66
9- A. Augustinovic 1951: 79
10- C. Benelli 2003: 68
11- Other examples of the artist's signature in Palestinian mosaics are found in Battir, Beit Jibril, Beth Shean, and in the synagogue of Beth Alpha.
12- C. Benelli 2003: 66
13- An indiction is any of the years in a 15-year cycle used to date documents unrelated to tax collection.
14- O. Meinardus, 1966: 189 f.
15- O. Hamdan – C. Benelli, 2005
16- C. Fiori and M. Vandini, 2002:68
17- A. Atiye, 2003: 171
18- A. Atiye, 2003: 71-75
19- O. Hamdan – C. Benelli, 2005
20- A. Atiye, 2003: 177-8
21- C. Fiori and M. Vandini, 2002: 73
22- The swelling is a degradation that can occur in mosaic floors. It is caused by the detachment of tesserae from their bedding or among the different layers of the bedding.
23- Primal is a white, milky acrylic resin, which should be diluted with water, depending on needs.
24- Paraloid B72 is a fixative acrylic resin solution, suitable to consolidate porous surfaces. It penetrates into the pores without leaving residues over the surface at the end of the process.
25- Piccirillo, M. 1992
26- Piccirillo M.1973: 326
27- M. Piccirillo and G. Raddi 1997: 466
28- In October 1994, after the conclusion of her intervention, the conservator wrote a technical report.
29- Technical report of conservator Giancarlo Raddi in November 1997
30- Technical report of conservator Franco Sciorilli in September 2002
31- O. Hamdan, and C. Benelli 2003; O. Hamdan, and C. Benelli 2005
32- O. Hamdan, and C. Benelli 2003; O. Hamdan, and C. Benelli 2005
33- O. Hamdan, and C. Benelli 2003
34- O. Hamdan, and C. Benelli 2005