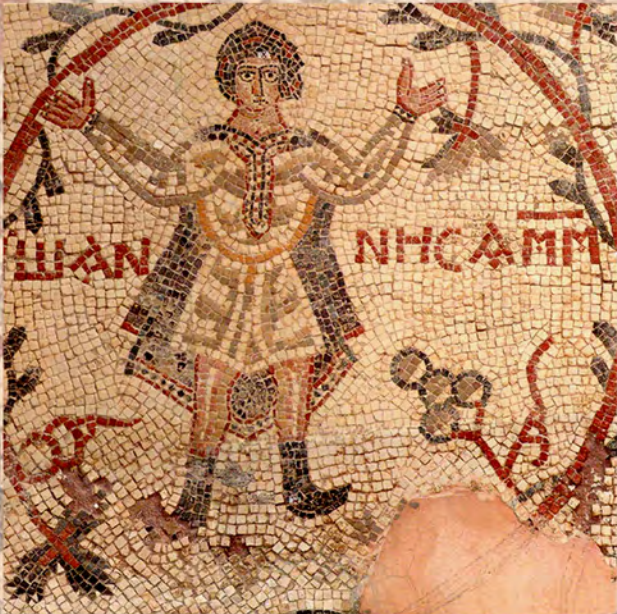


BILAD AL-SHAM II



TRAINING COURSE IN MOSAIC RESTORATION

Madaba . JORDAN - Suwaydah . SYRIA - Jericho . PALESTINE

2005

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



الجمهورية العربية السورية



المديرية العامة للآثار العامة

COMMITTEE FOR THE PROMOTION OF TOURISM
IN THE GOVERNORATE OF JERICHO
Palestinian Mosaic Workshop



هيئة تنشيط السياحة في محافظة أريحا والأغوار
مركز فميساء فلسطين



**BILAD AL-SHAM II - TRAINING COURSE IN
MOSAIC RESTORATION**

2005

Madaba - JORDAN - Suwaydah - SYRIA - Jericho - PALESTINE

Edited by Osama Hamdan - Carla Benelli

May 2005

BILAD AL-SHAM II - TRAINING COURSE IN MOSAIC RESTORATION - 2005

Madaba - JORDAN - Suwaydah - SYRIA - Jericho - PALESTINE

Participating Partners:

JORDAN

Department of Antiquities

PALESTINE

Palestinian Mosaic Workshop - Committee for the Promotion of Tourism in the Governorate of Jericho

SYRIA

General Department of Antiquities and Museums

LEBANON

University of Lebanon

ITALY

Cooperazione Internazionale Sud Sud (CISS)

Supported by:

European Commission Technical Assistance Office for the West Bank and Gaza Strip

Studium Biblicum Franciscanum - Jerusalem

Texts by Arch. Osama Hamdan and Ms. Carla Benelli, supported by Dr. Tagrid Shaaban, Ms. Catherine Hamarne, Restorer Franco Sciorilli and Arch. Suzan Matar.

Photo: Arch. Osama Hamdan, Restorer Franco Sciorilli and trainees.

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Design: Arch. Osama Hamdan, Ms. Carla Benelli, Arch. Suzan Matar

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The Middle East region is rich in civilization, history and culture. Mosaics are an important part of them all. That is the reason why there is an arising interest in Mosaic restoration and production in Palestine. This can and should be done through the development of capacity building and training of skilled staff in the sector, which is an important aspect of conservation activity.

Conservation needs integrated approach and exchange of experiences and knowledge with others. We are eager to work and cooperate with all those who support and help us to develop our capacity in this field. Since 2000, a group of young Palestinians has been trained in Jericho in Mosaic restoration and production, they participated in common activities with the Palestinian Department of Antiquities, the Jordanian Department of Antiquities and the Syrian General Department of Antiquities and Museum. They worked and learned, side by side, with Jordanian, Syrian and Lebanese colleagues.

This year we were able to come to work also in Palestine, in Jericho. We, the Committee for the Promotion of Tourism in the Governorate of Jericho and Al-Aghwar (the Jordan River Rift Valley) are proud of it.

The preservation of cultural heritage requires from us all, serious and professional work, taking advantage of technical and financial experience and support of others. To prove that Palestinians are able to participate and to share with others, the benefits and responsibilities for the preservation of their cultural heritage is an honor and a pleasure.

Let me thanks all our partners in this project, the Jordanian Department of Antiquities and the Syrian General Department of Antiquities and Museum for their help and friendship, the Institute Studium Biblicum Franciscanum of Jerusalem and the Italian NGO CISS for their technical and financial support. We express a special thank to the European Technical Office for West Bank and Gaza Strip for the trust and the opportunity they gave us to work and cooperate with them.

We are grateful to the Coptic Orthodox Church in Jericho and we hope to have soon other opportunities to continue to cooperate in the field of conservation of Palestinian cultural heritage.

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



The Jordanian Department of Antiquities welcomes the publication of the second book on Bilad Al Sham – Training course on Mosaic Restoration. This organized archaeological work has the objective to train skilled staff coming from the region of *Bilad Al Sham*, in the Hashemite Kingdom of Jordan, through Jordanian, Palestinian and Italian architects and technicians. The training course has become an annual meeting for young people of both sexes working in archaeology and for those who invest in the field of conservation of cultural heritage, a sector which is considered a real and sincere point of reference for the development of architecture and interior decoration, reflecting social, artistic and economical life of the people of the region, from the first centuries of the Christian era to Byzantine and Islamic period. Mosaic art is characteristic of the Mediterranean and Levant, regions among the richest in this kind of art.

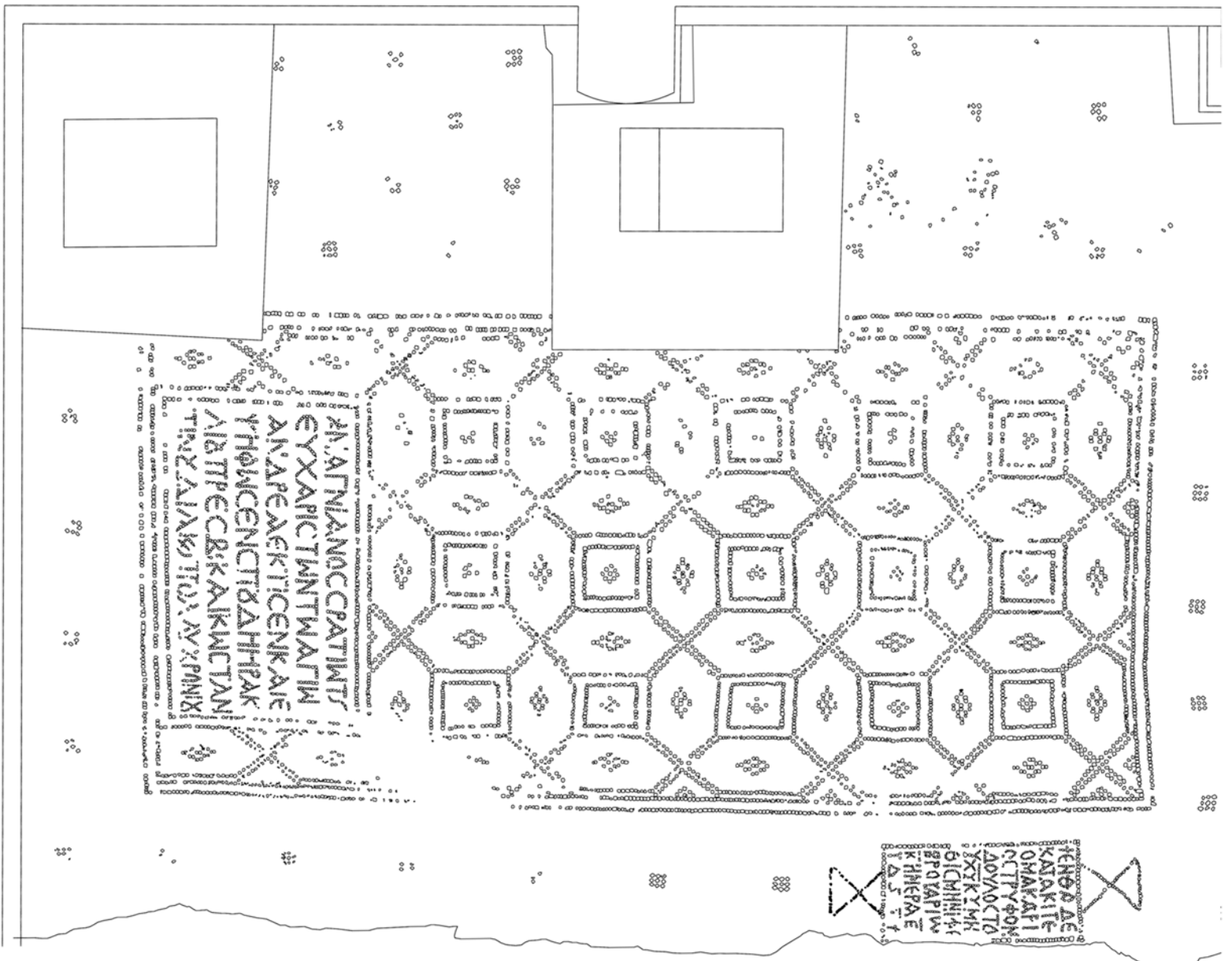
This is the reason in the interest for this training, which could be an example of regional and international cooperation in the field of conservation and in national capacity building, through the supply of specialized modern methods and means to local staff, to improve their capacity to develop and honor their national duty.

To make this annual experience able to reach all the ones who are interested in archaeology and especially in mosaic, we have asked those who managed the training course, to document their work and their activities and to spread them in a simple and understandable language.

Let us underline two main issues: first that the Bilad Al Sham training course, which started five years ago, has become a two-month annual gathering for researchers, trainees and specialists in our region and it is rare to find such continuity in the field of preservation of cultural heritage. Second, we hope that this experience of regional cooperation will give opportunities, to our brothers and friends of the Department of Antiquities of other Arab countries, to join us in this project, that we hope will continue and develop to the benefit of all those working in mosaic restoration.

Finally, I would like to thank all the Institutions and people participating in the support, preparation and organization of these training courses.

Dr. Fawwaz Al-Khraysheh
Director General of the Jordanian Department of Antiquities



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Graphic Scale

(in meter)



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ΠΡΟΤΑΠΙΩ
ΚΗΝΕΡΑΕ
ΥΔΣΤ

Another important step further for the training of young people from Jordan, Syria, Lebanon and Palestine in conservation of cultural heritage, have taken place thanks to the cooperation among the Jordan Department of Antiquities, the Syrian General Department of Antiquities and Museums and the Committee for the Promotion of Tourism in the Governorate of Jericho, supported by the European Commission Technical Assistance Office for West Bank and Gaza Strip, the Studium Biblicum Franciscanum of Jerusalem and the Italian NGO CISS. The project of training and restoration followed an experimented program, which already gave many positive results.

In Syria trainees completed the restoration of the mosaic of the *Three Personifications*, as asked by the Syrian General Department of Antiquities and Museum in 2003. The mosaic, badly pulled out from its location by illegal diggers, to sell it on the international market, was reinserted into its geometric pattern, which decorated the tomb outside the wall of Apamea. Trainees also cleaned the surfaces of two mosaics from Shahba/Philippopolis exhibited in the Archaeological Museum of Suwaydah.

In Jordan, work focused on the restoration of the large figurative panel that once decorated the northern nave of the church of Saint George in Khirbat al-Mukhayyat, since twenty years exhibited in the Memorial Moses on Mount Nebo. Of the original composition, photographed in the 1930's, decorated with vines trellis by the side of a palm tree and with a *filia* (friendship) composition where the zebu faces a lion, remains the portray of John, the son of Ammonius, as orans, standing with open rising arms. It was in his memory that his parents and family built the church and decorated it with a mosaic floor in 536 A.D.

In Palestine, the team worked in Jericho, to document and clean the mosaic of the church of Saint Andrew, entrusted to the Fathers of the Coptic Orthodox Patriarchate of Alexandria, represented there by Abuna Mena, an Egyptian monk, responsible for the farm and the church, always smiling and friendly.

The meeting with Abuna Mena, gives me the opportunity to underline one of the merit of this project: the possibility for our young people to meet in different environment, to work together in friendship with Christian monks, and to overcome barriers, which are maybe unconscious, because no one have never given them the opportunity to get over the cloister wall of a convent, built also to safeguard the same mosaics which now they are, thank to modern technology, helping to preserve.

The visits, finalized to know the present and future needs of the historical and artistic heritage of the countries participating in the project, have had also the important merit to allow trainees to meet with Political Authorities, Mayors and Officers of the Ministries of Cultural Heritage. It is another way to exchange experiences and opinions on how to tackle together the huge obligation to preserve for all History and Beauty in the future.

This year also, special thanks go to the core of the project, Arch. Osama Hamdan, Ms Carla Benelli and restorer Franco Sciorilli, who are by now mythical figures among young restorers in the Middle East. I am proud to cooperate with them in a project, which I hope will continue to be pursued by Local and European Authorities.

Michele Piccirillo, ofm
Studium Biblicum Franciscanum



Along the path of humanity there have been many civilizations with different characteristics. Most of them are lost forever, the past has erased all traces and they left no evidence of their existence. Anyhow historian and archaeologists agree that these civilizations remain in our soul. The past is living also if it is not visible. For this reason we have the duty to know our history, to understand our past and its contents, to be able to build our present and future.

Syria is aware of its historical importance and civilization. Syria is considered an important country, working hard and seriously to study, valorize and preserve its cultural heritage, archaeology and sites, which are innumerable and invaluable. Some of them are still uncovered, some have been discovered, detached from the original location and exposed in museums or stored, and some are still *in situ*.

To preserve this huge heritage we are trying to develop our capacity and to improve the experience and skill of our local experts, to learn new methods and tools in the field of restoration, thanks to the opening of channels of cooperation with specialized scientific institutions at international level, who are our friends.

Without doubt the Bilad Al Sham – Training course in ancient mosaics restoration project, launched in 2000 by the Italian NGO CISS, the Italian Cooperation, the Studium Biblicum Franciscanum and the European Commission Technical Assistance Office for West Bank and Gaza Strip, to whom participated the Jordanian Department of Antiquities, the Syrian General Department of Antiquities and Museum and the Palestinian Mosaic Workshop – Committee for the Promotion of Tourism in the Governorate of Jericho, has had a special role in the training of our national experts in mosaic restoration.

We are all eager to increase this cooperation in the future, not only in the field of mosaic restoration but in all different sectors of the preservation and conservation of cultural heritage.

Dr. Bassam Jamus
Director General for Syrian Antiquities and Museums



This new publication illustrates the results of what we may consider a second phase of Bilad Al Sham project. It is a great pleasure for CISS, a development NGO working in the field of international solidarity, to see that a journey initiated long time ago through diversified actions, all linked by an ideal thread – it is starting to give more advantages than expected.

Indeed very few NGOs, almost always obliged to intervene in catastrophic situations, poverty or extreme degradation, give priority to intervention in the sector of conservation and enhancement of cultural heritage, assuming – in our opinion erroneously – that others should be the priorities of international solidarity.

CISS, on the contrary, has recognized also in this field the possibility to give an important contribution to peace, cooperation among peoples and territorial development.

Following the achieved results, we believe that this project, based on mutual cooperation among Jordanian, Lebanese, Palestinian and Syrian institutions and organizations, and realized thanks to the contribution of the Studium Biblicum Franciscanum and the European Union, has fulfilled his important objectives in the training of skilled staff in conservation of cultural heritage, which represents an historical and cultural heritage for all humanity. It has also given further and necessary evidence on how to work in this field could be an important tool for international and regional cooperation.

Good results, as always, follow above all the effort and the care of those – people or institutions – who believed in the challenge that such kind of project represents. To them I extend our most sincere appreciation and thanks.

Dr. Sergio Cipolla
President Cooperazione Internazionale Sud Sud (CISS)





Bilad Al Sham II – Training Course in ancient mosaics restoration

Since 2000 the Palestinian Mosaic Workshop and the Madaba Mosaic School have carried out, during the summer, joint training courses on mosaic restoration. Since the beginning the experience was very successful and in 2002 Palestinian and Jordanian trainees were joined by Syrian and Lebanese students. Based on these previous courses, the Bilad Al-Sham project is organizing, since the summer of 2003, training courses for experts in ancient mosaic restoration.

In 2005 fifteen trainees, coming from Jordan, Lebanon, Palestine and Syria, attended a two-months training course held in Suwaydah (Syria) and Madaba (Jordan). Palestinian trainees continued their training in one-month course in Jericho (Palestinian Autonomous Areas).

Prepared and managed by the Jordanian and Syrian Department of Antiquities, by the Palestinian Mosaic Workshop – Committee for the Promotion of Tourism in the Governorate of Jericho and the Madaba Mosaic School, the project has been technically and financially supported by the Italian NGO CISS, the European Commission Technical Assistance Office for West Bank and Gaza Strip and by the Studium Biblicum Franciscanum.



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 by abandon and neglect, thanks to the practical experiences of restoration during the training process.
3. To enhance the huge cultural heritage in mosaics of Roman, 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 included a three-months training course on ancient mosaic restoration and activities of awareness on the importance of preserving cultural heritage.

The training course was structured in four parts: on-the-job training through restoration activities, theory, education site visits and documentation.



Restoration work was an integral part of the training program. The staff and the trainees projected, carried out and documented all the activities of the intervention, which was conducted in Jordan in the Church of Saint George in Khirbet Al Mukhayyat and in the Church of Saint Stephen in Umm Al-Rasas; in Syria on detached mosaics from Aphamea and on the mosaics of the Archaeological Museum of Suwaydah and in Palestine in the Coptic Church of St. Andrew in Jericho.

Theory lectures were also organized in Jordan and Syria. A special section of the training course was dedicated to the importance of documentation in the preservation of cultural heritage.

Educational visits were carried out to enjoy the rich cultural diversity of the area. The results of the training were presented at a Conference in Madaba (Jordan), organized by the Jordanian Department of Antiquities and through an exhibition of posters in Sicily (Italy), organized by CISS.



Staff and Trainees

The Jordanian Department of Antiquities, directed by Dr. Fawwaz Al-Kraysheh, participated in the project through the director of the Madaba Mosaic School, Ms. Catherine Hamarne.

The Syrian General Department of Antiquities and Museum, directed then by Dr. Tammam Fakouch and now by Dr. Basam Jamous, participated through Dr. Tagrid Shaaban, Ms. Loda Mahfudh and Dr. Amro Al Adem.

Architect Osama Hamdan, of the Palestinian Mosaic Workshop – Committee for the Promotion of Tourism in the Governorate of Jericho, directed the project, under the scientific supervision of Father Michele Piccirillo of the Studium Biblicum Franciscanum. Ms. Carla Benelli, of the Italian Ngo CISS, coordinated the project. The mosaic expert, Mr. Franco Sciorilli, monitored the training and restoration activities. Arch. Suzan Matar followed the training in documentation.

The trainees were: Mr. Yousef Abu Farda, Mr. Mohammad Freij, Mr. Hazem Kanaan and Ms. Samaher Khamis from Jordan; Mr. Hasan Badawi as coordinator, Mr. Hussein Badawi and Mr. Kaisar Mekdad from Lebanon; Ms. Nawal Jarira, Mr. Maher Aljbai and Ms. Leila Al Turk from Syria; Ms. Fardos Al Haj, Ms. Khulud Attili, Mr. Mohammad Hamdan, Mr. Nader Haji and Mr. Raed Al Khalil from Palestine.





Mosaics from a tomb in Apamea, Syria

Historical background

The mosaics were discovered in a tomb, 500 meters outside the walls of Apamea, in 1997.

The tomb was divided into three rooms: the pavement of the first room was 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 representations in the middle, each of 85 x 68 cm. The first representation was surrounded by fishes and other sea animals. It represents the Water that encircles the Earth. The second representation is a woman crowned by fruits and leaves. Under it, a Greek inscription identifies it as Earth. The third representation, which is also crowned and has a circle at the back, is identified by a Greek inscription as Time. The third room was decorated just on the walls. The mosaics probably date from 4/5th century A.D.

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



Restoration work during the first phase of Bilad Al Sham project

To start the conservation activities of the training course, the mosaics were transported from Damascus to the Shahba Museum. For the trainees it was a very good opportunity to work on mosaics in such bad condition. They could work on mosaics detached from their original site and not re-laid over a solid bedding layer.

In fact the Syrian General Department of Antiquities and Museums, worried for the safeguard of the mosaics after some parts were stolen from the tomb, had proceeded to the detachment, gluing a cotton canvas over the mosaics and then enrolling them.

The bad condition of the mosaics influenced the work plan of the training course and special attention was given to save the tesserae that came off during storage.

Restoration activities carried out during the first training course in 2003 can be summarized as follows. After the documentation on the state of conservation, mosaics were mechanically and chemically cleaned over the surface and residues of mortar and sand were taken off from the back.



Trainees carried out consolidation of tesserae, then cut the mosaics in smaller numbered sections. The first room mosaic was cut in seven sections and the one of the *Three representations* in eleven sections. To the latter, the two stolen and recovered pieces were added. Then trainees re-laid the sections of the *Three representations* over honeycomb panels by compatible mortar. The other sections were prepared to be re-laid in a second phase and were positioned over honeycomb layers, to be stored in a safe way in the Suwaydah Museum.

Restoration work during the Bilad Al Sham II project - 2005

The mosaics were suffering for the following problems:

- decay of tesserae, especially the red and white ones, after being hammered to detach the mosaics from original site. Also black and yellow tesserae were affected by decay, mostly due to their composition, while the red ones suffered from chromatic alteration;
- a hard crust over the surface;
- a yellow layer over the surface, due to the kind of glue used to detach the mosaics and the humidity during storage;



- a black layer of dirt and dust between tesserae;

- because of the detachment and bad storage condition, many tesserae went lost.

Following works were carried out over the pieces of mosaics re-laid over honeycomb panels during the previous phase:

a) The cotton canvas was removed from the surface by thinner. The operation was carried out in diagonal, to avoid further detachment of tesserae;

b) Glue residues were removed from the surface of the tesserae by chemical cleaning, taking care of using the paint remover more than once but for a short period of time, to avoid damaging the tesserae;

c) The surface was cleaned by water and brushes;

d) The entire surface was cleaned from light concretions, using manual mechanical means, such as scalpel, chisel and vibrating cutter;



e) During the cleaning, consolidation works were carried out along the edges, using diluted Primal AC33. Where necessary, edges were consolidated by mortar, based on lime, marble and stone powder, mixed with Primal AC33;

f) The various sections of mosaics were reassembled together, leaving 1 cm without tesserae around every piece, to facilitate the operation. Before the composition, all the edges were carefully cleaned and finally consolidated fixing the detached tesserae;

g) Lost tesserae were re-laid to complete the composition, using the ones which were previously stored and catalogued;

h) All the sections of the two mosaics of the tomb were reassembled joining the sections that were restored this year with the ones restored during the previous season.





Hunting scene, Museum of Suwaydah, Syria

Historical background

The mosaic panel was discovered in 1934 in Shahba (ancient Philippiopolis), near the Public Bath. It dates to the period of Roman emperor Philip the Arab (244 – 249 A.D.) who was born there. It is now exhibited in the Mosaics and Gods Statues Hall in the Archaeological Museum at Suwaydah (Syria). The mosaic measures 2,44 x 1,32 cm. and it is composed by black, white, red, rose, gray, pale and dark yellow and beige tesserae.

A guilloche divides the panel in four squares: two describe a similar scene of a lion hunting a gazelle and the others show a cock and a hen, near a snake, picking a sprig.

State of conservation

In the past the mosaic has been detached, laid over a cement bedding layer and exposed in the Museum. The panel showed a serious of problems, among which:

- the hardness of the bedding, composed by cement mixed with basalt;



- a protective varnish applied over the mosaic surface, without cleaning it before the application, which accelerate the degrade;
- residues of cement due to lack of cleaning after the re-laying process;
- an excessive weight due to the thickness of the cement bedding layer;
- internal lacunae restored in the past by cement mortar;
- some tesserae were disaggregated and exfoliated.

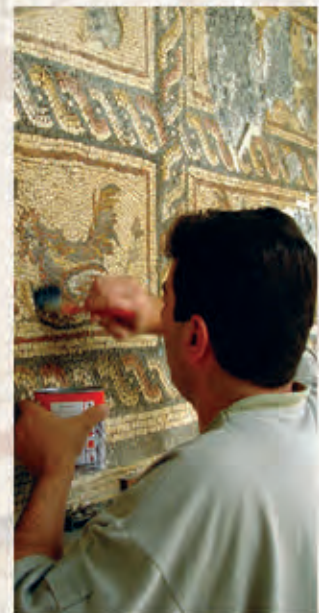
Conservative intervention

Restoration was planned to solve some of the mosaic problems, taking into consideration that the complete removal of the cement bedding layer was not possible, for shortage of time.

Works were carried out in the same room of the Museum where the piece is exposed, and focalized on the concept of how to carry out ordinary maintenance on a displayed mosaic.

The following activities were carried out:

- the wooden frame around the panel was removed;
- the cement level around the mosaic edges was lowered from 8 mm to 1 cm by chisel and hammer;
- the cement level inside the lacunae was 5 mm. lowered;



- the superficial layer of varnish was chemically removed using cleaning packs of thinner and water, after the division of the panel in small square of 30 x 30 cm;
- the panel was carefully washed to remove all chemical residues;
- the cleaning operation was completed by manual mechanical method, using chisel, hammer and scalpel;
- external edges of the mosaic were reinforced and consolidated by a 3-4 mm. mortar composed by marble powder, stone powder and lime at 1:2:1;
- internal lacunae were filled by a similar mortar, 3 mm high, enriched by pozzolana, at 1:2:1:0,5;
- chemical cleaning was carried out washing the mosaic with ammonium carbonate mixed with water at 50 g/1 lt., by spray and plastic brushes;
- a final washing was needed to remove all ammonium carbonate residues;
- the mosaic surface was finally protected by an application of Paraloid B72 and thinner at 7-7,5 g/1lt.





The Wedding of Thetis and Peleus , Museum of Suwaydah, Syria

The mosaic exhibited in the Mosaics and Gods Statues Hall at the Archaeological Museum of Suwaydah (Syria) was discovered in 1929 in a villa at Shahba (ancient Philoppopolis). It dates to the period of the Roman emperor Philip the Arab (244-249 A.D.). It measures 4,32 x 1,70 m. and is composed by red, black, pale gray, dark gray, white, dark yellow and pink tesserae.

The mosaic represents the wedding of Peleus, son of the king of Aegina, and the Nereid Thetis. All the gods attended the wedding and brought magnificent gifts, among which two immortal horses. Thetis and Peleus had a son, Achilles, the famous warrior who died during the Trojan War. The composition, which has many lacunae, depicts nine persons.

State of Conservation of the Mosaic

In the past the mosaic has been detached from its original location, re-laid over a cement bedding layer and exposed in the Museum.

The panel showed a series of problems, among which:

- Chromatic alteration by fire damage;
- A cement deposit on the mosaic surface;

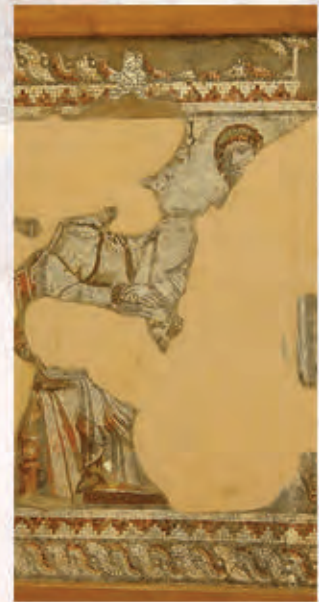
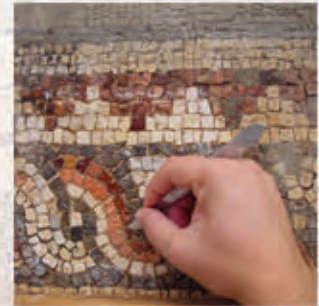


- Presence of incompatible materials with the principles of conservation, used to glue together the pieces of mosaic;
- Lack of many tesserae;
- The hardness of the bedding layer, composed by cement mixed with basalt.

Intervention

Besides the weight of the mosaic, which made difficult the restoration process, trainees carried out the following intervention:

- Removal of varnish from the mosaic surface by varnish remover;
- Mechanical and manual cleaning using hammer and scalpel;
- Chemical cleaning using ammonium carbonate, washing out all the residues by plastic brushes, sponges and water;
- The mosaic surface was then protected by a layer of Polaroid diluted in thinner.





Mechanical cleaning tests

A special section of the training course concerned various methods and tools to clean mosaics by mechanical way. Two days of the training course were spent to show and explain structure and function of different tools, how they should be used in the cleaning process and different aspects to take into consideration before to choose the most suitable cleaning method.

Tests were carried out to teach trainees the best use of each tool, to check their efficacy and to monitor positive and negative results.

Small parts of mosaic surfaces – not more than 10 x 10 cm. – were chosen for tests.

In the Shahba mosaic, the test was conducted on the external lateral surface, because it was far from the main decoration and also because marginal parts of the mosaic were suffering more problems than the central part. If the cleaning test would have given good results in the most difficult area, it will be successful also on the remaining surface.



During the training section, following tests were carried out:

- Ultrasonic system: the various components of the ultrasonic device were shown and explained, considering its application to mosaic cleaning. The test was carried out by Ms. Loda Mahfudh, of the Syrian General Department of Antiquities and Museums, over a small part of the Mosaic of the *Four seasons*, exhibited in the Archaeological Museum at Suwaydah (Syria). The result of the cleaning test was good, but the system leaves a thin white layer over the surface of the tesserae. Moreover is quite slow and difficult to use over large surfaces.

- Micro Sand blaster machine: it is a tool that works spraying aluminum oxide. The test was carried out by the Italian restorer Mr. Franco Sciorilli, over the mosaic of *Orpheus and the animals*, which decorates the pavement of the Roman villa preserved inside the Shahba Museum (Syria). A small part of the mosaic was chosen to carry out the test in a very careful way, also to teach how to carry out tests in a safety way wearing protective mask and glasses.



The result of the test was good, and among the positive aspects of this instrument, there is the possibility to control and remove easily the residues of dirty without damaging the mosaic.

- Vibrating cutter: it is a small tool that works through air pressure and water. The pressure of the air can be controlled by the restored, following the hardness of the stones and of the crusts and concretions to remove. The result of the test was good.

In general, all tests gave good results and the experimented tools can be considered all suitable for mosaic careful cleaning. Anyhow it should be taken into consideration that all the mechanical tools left few scratches over the mosaic surface and removed part of the protective patina.





Restoration of the mosaics of the church of Saint George, Khirbet al-Mukhayyat, Jordan

Historical background

The 6th century A.D. church of Saint George, situated in the highest point of the acropolis at Khirbet al-Mukhayyat, was discovered and excavated in 1935 by Brother Mihaic and published in 1949 by Father B.Bagatti and S.Saller of the Studium Biblicum Franciscanum.

Due to the severe state of degradation of the mosaic floor – more than 40% of the original mosaic had already been destroyed – in 1977, the archaeological expedition directed by Father Michele Piccirillo removed the mosaic from its original location to prevent further damage, and re-laid it on a reinforced concrete bedding-layer.

The mosaic floor is one of the oldest in Madaba region, and was in extreme need of restoration. Bibliographical research was conducted over the site and the mosaic and its state of conservation was documented.



Restoration work during previous experiences

The restoration of the mosaics of Saint George started as joint training course organized by the Madaba Mosaic School of the Jordanian Department of Antiquities and the Jericho Workshop for Mosaic Restoration (Palestine). The activity started in 2000 and continued until 2002. Since 2003 up to now, the work continued in cooperation between the Madaba Mosaic School and the Palestinian Mosaic Workshop – Committee for the Promotion of Tourism in the Governorate of Jericho.

The restoration work was carried out in four phases, one month every year, focusing on the mosaic of the central nave and its frame.

The team worked to remove the cement layer and to re-lay the pieces of mosaic over honeycomb panels. The original design of the mosaic floor of the church was drawn over a plastic sheet, following old photographic and graphic documentation and then the various mosaic pieces were fixed together as in the original drawing, by compatible material. Lost areas of the design were drawn by watercolors.



Due to the lack of documentation and exact plans, some problems emerged in fixing all the pieces. So the team went back to the original site, from where the pieces were detached in 1977, to document the plan of the church and to study if it was possible to put back the mosaics or to exhibit them in another compatible site.

The experience is mainly a training course for experts in mosaic restoration. Trainees from Jordan and Palestine participated to the project in the first two years and then were joined by trainees coming from Lebanon and Syria.

This activity is a yearly fixed appointment among restorers in the area, and it is now known as Bilad Al Sham project – Training course for mosaic restoration.

Restoration work during the Bilad Al Sham II project - 2005

Mosaic description

This year we worked over the northern nave panel. It is a rectangular panel, 4,32 x 2,95 m, decorated with vine scrolls formed by two vines emerging with a palm from a jar placed between two peacocks.



The scrolls contain the figures of a vintner cutting grapes and a young man portrayed as an orans: John [son] of Ammonius. Inside the eastern side of the panel, but not in the scrolls, a lion and a zebu face each other.

State of conservation

The panel was in bad condition, in particular for the following problems:

- Residues of black cement over the mosaic surface;
- Lacunae closed in the past by black cement;
- Depression;
- Decay of tesserae;
- Cracks;
- A layer of wax over the entire surface.

Intervention

The mosaic was standing in vertical along the central nave of the Moses Memorial Church at Mount Nebo, fixed on its roof. Working on a scaffold, trainees carried out the following restoration works:

- Documentation of the state of conservation of the panel, before any intervention.



The work was carried out where the mosaic was in exhibition, inside the church. Due to the importance of this phase during this year training course, the activity will be described in a dedicated chapter.

- Residues of cement and mortar over the surface were removed using scalpel, hammer and chisel.

- The superficial layer of wax was chemically removed using cleaning packs of trichloroethylene, a chemical product used to remove oily materials. Due to the location of the mosaic, this activity was particularly complex to be carried out.

- It was necessary to remove the wax from the surface of the mosaic, to fix a cotton canvas to remove its concrete bedding-layer.

- The panel was drawn over a nylon sheet at scale 1:1, using various colors: black to draw main lines; red to define lacunae; blue for cracks; green for external lines; light blue to define the lines where to cut the mosaic for the removal of the bedding. Over the surface of the mosaic, a series of points of reference were drawn, to facilitate the reassembling of the sections after the restoration.



- Due to its heavy weight, to remove the panel from the church, trainees had to cut it into sections. When they started the work, they discovered that the cutting would have been very difficult and slow because there were iron bars inside the concrete of the bedding-layer.

- The panel was finally taken out of the church in seven sections. To avoid the lost of tesserae during the removal of the bedding, the sections were fixed by a cotton canvas, glued over the surface by vinyl adhesive left for 24 hour and then with another cotton canvas fixed by animal glue.

- The cement bedding-layer was removed cutting it in small squares of 6 x 6 cm or 3 x 3 cm. In a first phase, the cement was removed by a big grinder, then, when the cut reached the tesserae, a small one was used, for a better control. Finally all the cement in the back of the mosaic was removed by chisel and hammer.

- The edges of the sections were cleaned to prepare them to be re-laid over honeycomb panels.

- Honeycomb panels were covered by grit and resin, and mortar was prepared for the future re-laying of all the sections.





Restoration of the mosaics of the church of Saint Stephen, Umm Al-Rasas, Jordan

Historical background

The town of Umm Al-Rasas is located 30 km south-east of Madaba. Due to the wealth of inscriptions and the quality of the mosaics, the church of Saint Stephen, discovered in 1986, is one of the most important archaeological sites in Jordan. The church was built above an older monument. A small section of a lower mosaic floor was found under the base of the church's altar.

The presbytery of the church was paved with mosaics in A.D. 756, as stated in the dedicatory inscription. All the figures in the hunting, agricultural and pastoral scenes of the mosaics, as well as the benefactors, portrayed as gift bearers, were destroyed by iconoclasts. In the frame of the central carpet and in the four panels of the intercolumnar spaces, a series of city plans remain untouched: ten cities in the Nile Delta, eight west of the Jordan River and seven cities east of the river.



Restoration work

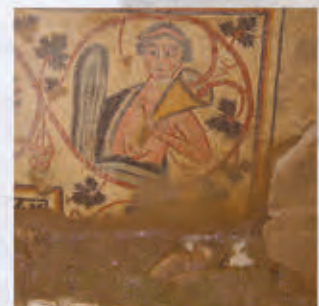
The restoration work over the mosaic of the church of Saint Stephen started in the previous Bilad Al-Sham project, during which we worked mostly on the concept of ordinary maintenance of cultural heritage in general, and on mosaics in particular. During the present training course, we continued to stress the importance of this approach in a comprehensive conservation philosophy, to avoid future radical intervention of restoration, which are always traumatic for any cultural heritage.

The intervention during the training mostly focused over the cleaning of the mosaic pavement by broom and brushes from dust and sand collapsed from the walls. During the survey on the state of conservation of the mosaic, we noticed an oily layer over some parts of the surface. From a quick inquiry emerged that the guardian of the site, following a personal initiative, used to oil the surface of the mosaic to show it shining to visitors, who could take nicer pictures. So this layer had to be removed by thinner, brushes and cotton. The guardian was informed over the negative impact of his habit on the mosaic.



The cleaning was carried out after having reinforced the mosaic by fixing some loose tesserae by mortar based on lime, stone powder and local sand (from Suwaylah) at 1:1:1,5. To avoid the lost of further tesserae, lacunae were filled by mortar based on lime, stone powder and local sand at 1:1:1.

Trainees had the opportunity to experiment how, thanks to the ordinary maintenance of last year, this year the intervention was easier, quicker and consequently less expensive. This fact confirms the validity of ordinary maintenance, which with a small investment of human and material resources, preserves the authenticity of cultural heritage, avoiding radical intervention.





Documentation

Documentation is one of the most important steps to carry out before any intervention of restoration on any element of a cultural heritage. There are many ways to carry out the documentation, but its main aim is always to have drawing, photographic or written materials concerning the cultural heritage which is object of intervention, and to use it as a base to study its state of conservation, its history, its problems and kind and amount of needed restoration.

One of the most common ways to prepare the documentation of mosaic floors uses digital camera to take pictures and computer to transfer and process data. This method allows getting very accurate information at true scale and high resolution images.

We used this process to document the mosaic of the Church of Saint George, during Bilad Al- Sham II training course on mosaic restoration, which was held in Syria, Jordan and Palestine.



A special section of the training course was dedicated to the documentation. It was held in Jordan, in the laboratory of the Madaba Mosaic School of the Jordanian Department of Antiquities, and lasted one month. It was attended by one trainee for each country participating in the project. One Jordanian, one Syrian, one Lebanese and one Palestinian trainee followed the documentation section, as part of their training process.

The training course was held by Arch. Suzan Matar, who came from Palestine. She has been working in the field of documentation since many years and she has developed a series of documentation methods using simple tools, preventing the need for sophisticated equipment. She has also been experimenting tools and methods to save time during the process.

The training course focused on practical issues in the documentation phase and on the importance of this phase for conservation activities. Trainees carried out documentation over the mosaics on which the training course was developing restoration activities. They had the opportunity to learn and to apply the complete documentation phase over the mosaics.



The training section was divided in two main parts:

- 1- Work in the field, preparing works and taking digital photographs;
- 2- Laboratory work, processing the data on computers to have a clear and precise photograph, which reflected the original in its state of conservation. The elaboration of this photograph by computer was at scale, so to have an image to start drawing the mosaic tessera by tessera.

Work was carried out through the following phases:

- The general condition of the mosaic floor was studied and analyzed. It was included into a geometric space with a right angle, using a strong plastic string;
- The space was divided on the mosaic into a geometric grid;
- The four corners and the center of each grid space were signed perpendicularly on the surface of the mosaic using a stickers tape. Then the strings were removed;
- A sketch for the grid was drawn on paper after taking all the dimensions of the sides and diagonals of the grid spaces;



- The next step was the photographic work, and one photo was taken by digital camera for each grid space, after checking that:

- the center of the lens of the camera was exactly perpendicular on the center of each grid space and that the distance between the lens of the camera and the mosaic floor was fixed in each photo;
- The camera has to be at level in each photo;
- The zoom and focusing have to be the same in each photo;
- The light has to be as much as possible the same during all the process.

- All the photos were then downloaded on the computer to be assembled into a single picture, at high resolution and graphic scale, following these steps:

- The grid was drawn on AutoCAD software program, at true dimensions and scale.



- The grid was transferred from AutoCAD to Photoshop software program, to insert all the photos of the mosaic on it. Every photo was fixed on the grid, taking care of its scale and rotation, to put it exactly in the right position and scale. Finally we get a final single photo for the entire mosaic floor;

- After the collection of the photos, the final single photo of the entire mosaic was transferred again from Photoshop to AutoCAD, and all the single tesserae composing the mosaic were drawn, to have an exact map of the mosaic;

- This map will be used as a base to prepare, in AutoCAD or Photoshop, the state of conservation map, the intervention map, and other maps necessary to understand the problem of the mosaic and to document exactly which kind of intervention of restoration is done, for each composing part.

At the end, after the analysis of the state of conservation map, the intervention is defined and localized over the base map. In the future, any further analysis or intervention can be based over this documentation.



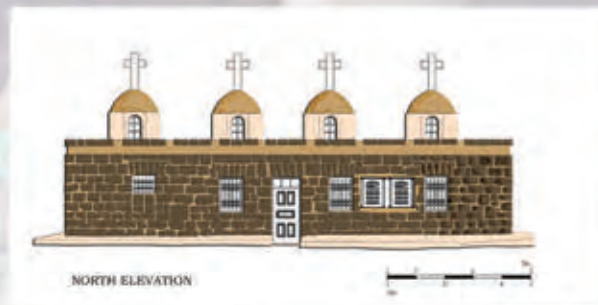
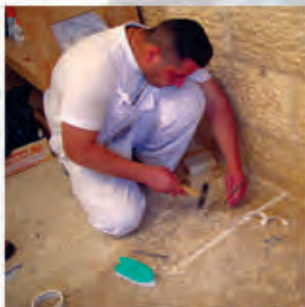


Restoration of the mosaics of the church of Saint Andrew, Jericho, Palestine

Historical Background

The ruins of the Byzantine church of Saint Andrew are located at the entrance of the oasis of Jericho, near the Herodian remains, along the old road to Jerusalem (the church and its mosaics have been studied by the authors of this booklet, as part of a comprehensive research on the Pre-Islamic Mosaics in Jericho, which will be published by Studium Biblicum Franciscanum).

In 1935, the Coptic Orthodox Church acquired the ruins of the church, thinking to buy what remained of the House of Zaccheus, the place where, following the Gospel, Christ rested during his travel to Jerusalem. A new chapel was built from 1937 to 1939 over the ancient remains, inserting the mosaic floor inside the new building. The site was identified and published in 1951 by Father Augustinovic as Saint Andrew, on the basis of an ancient dedicatory inscription in the mosaic floor.



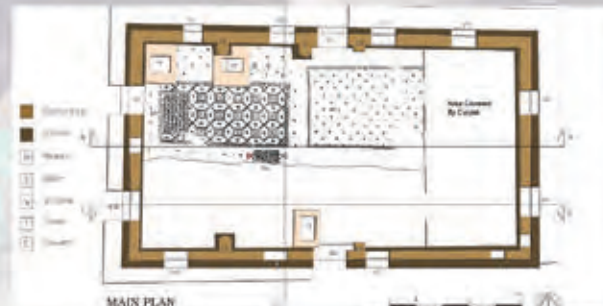
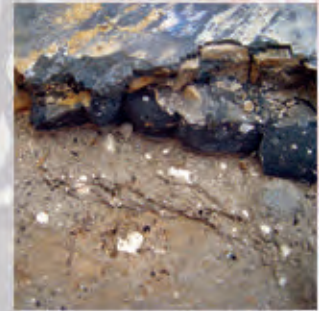
The church of Saint Andrew was built over a necropolis. Inside the chapel, three accesses to the tombs, venerated as relics, have been opened recently. The mosaics of the ancient church belonged to the same nave, probably the only one. The decoration of the two main panels is simple and geometric, composed by white, black and few red tesserae. A mosaic tomb inscription dates the entire mosaic at 592 A.D.

State of conservation and problems of the mosaic

- The mosaic pavement is inside the church, covered and protected by the new building from weather condition;
- Previous restorations, carried out without scientific approach and by material which was not compatible to conservation, had negative impact over the mosaic;
- A diffuse layer of white cement covered the mosaic surface. White cement was used in the past to fill spaces among tesserae and not cleaned after the use;
- A layer of wax, very thick in some parts, was covering the entire surface of the mosaic. It was used in the past with the aim of protecting it and make it brighter;
- There were residues of black cement, used in the past to fix some tesserae;



- The southern part of the church was repaved using cement, until the edges of the ancient mosaic. This caused a condition of rigidity which prevents the natural movement of the mosaic and has as consequences swellings and bulges;
- Near the northern entrance, a cement column has been built inside the mosaic pavement;
- Many tesserae went lost, especially around the opening of the recently fixed tombs;
- Past restoration activities to re-laid some tesserae had not been done in appropriate way and did not respect the original pattern of the decoration;
- An ancient fire left black residues over the surface;
- There are rust residues, due to the oxidization of some iron material left over the surface;
- There are black spots of light concretions and dust;
- Someone have used a grinder or other cutting equipment in the site without taking care of the mosaic, and left scratches over the surface;
- Some tesserae, especially the black one, were affected by decay and pitting because of their composition;



- Some depressions were due to the general weakness of the original mortar used to lay the mosaic and by the collapse of heavy materials over the surface;
- There were two kind of swellings: big ones where tesserae were completely detached from the bedding layer and small ones, inside the mortar, shaped as cells;
- There were some loose tesserae, detached from the bedding layer.



Intervention work

The mosaic was suffering from many problems. We started the work collecting and studying the photographic documentation and the state of conservation prepared in a previous activity carried out by the Palestinian team in 2002.

Then we proceeded as follows:

- Trainees made a test to check how to remove the layer of white cement from the surface. They used hammer, chisel and scalpel. Another test was carried out to check how to remove the wax layer both mechanically than chemically, by scalpel and paint remover. The test was positive in both cases;



- The pavement was then divided in squares, to control the different working areas. The mosaic was washed by water, and then the white cement started to be removed in mechanical way by hammer and chisel. This action was very difficult and slow. The cement was hard and the tesserae were weak, so the work had to be done carefully, taking care not to damage the tesserae. Trainees put a lot of time and patience to carry out the intervention, especially in the western part of the mosaic;

- The parts of the mosaic which were restored in the past, by repositioning tesserae in casual way and by black cement, were removed. The original tesserae and the lacunae were completely cleaned from cement and the original bedding layer was consolidated by water and Primal AC33 at 7%;

- The tesserae were re-laid in the right position by mortar based on lime;
- To fix the bedding layer under the tesserae, consolidation works were carried out by injection or by grouting, using Primal AC33 and water at 7-10%. The entire surface was cleaned to wash out all the chemical residues;

- Consolidation works were carried out over the surface in two ways: the first with water and Primal AC33 and the second adding mortar composed by lime, stone powder and marble powder at 1:1:1. The mortar was liquid and inserted into the mosaic by injection.



To do the injection a small hole was drilled in the pavement (max 3 mm.), at the center of the swelling. The swelling was cleaned by injecting water into the hole to remove all dirt. The swelling was then watered by water and Primal AC33 at 7% and, if it was big enough, liquid mortar was injected inside, to fill it completely;

- All intervention was documented on maps.



Conclusion

Restoration works were not completed over the entire mosaic, in particular the removal of the white cement layer was partial. The mosaic was suffering many problems and the training course did not last enough to face all of them.

Anyhow a huge amount was done and we hope, now that the state of conservation analysis is completed and that the kind of needed intervention is defined, to have next year the opportunity to complete the restoration.





Theory lessons

The theory aspect of the training course played an important role for the trainees. They could learn about fundamental issues related to their work in mosaics and cultural heritage conservation. Various specialists and experts in the field gave a series of lectures.

In Syria a theory lesson was developed by restorer Franco Sciorilli, concerning *Problems of conservation and materials used to intervene over mosaics*; dr. Tagrid Shaban, of the Syrian General Department of Antiquities and Museums, treated the *History of mosaic*, focusing on old methods and coloured stones used to manufacture mosaics; Ms. Loda Mahfoud, of the Syrian General Department of Antiquities and Museums, gave a lecture on *Chemical materials used in restoration*.



In Jordan, the Madaba Mosaic School organized two training days completely dedicated to theory lessons. The first day, Arch. Mai Ashaer of the Jordanian Department of Antiquities, developed a lecture on *Stone maintenance and restoration*; then Mr. Mohammad Balawne described *The mosaic floors of Mar Elias* and Mr. Yousef Sdfat lectured on *The new discoveries of mosaics in Dhat Al Rasas*. Finally Mr. Bilad Grisat gave a lecture on *Stone degradation*. The second day started with the representative of the Jordanian Authorities on Environment, who gave a lecture on *Geophysical methods used in archaeology*; then Dr. Mustafa Naddaf treated the subject of *Practical methods used to analyse archaeological materials*. At the end, Mr. Wasef Al Hawari lectured on *Factors of degrade affecting mosaic floors and importance of maintenance*.

Lectures were important to improve the skill of trainees and to reinforce the link among practical and theory aspects of their training.





Educational visits

During the training course, some educational visits to archaeological and historical sites as well as restoration yards, were included. Visits increased the knowledge of trainees about the area and its cultural resources, and helped them to better understand which problems are affecting the sites and what kind of solution can be adopted to preserve and enhance them.

In Syria, an education visit was organized in the ancient town of Apamea, where trainees could also see the original location of the mosaics they were working on. They visited Aleppo, the Museum of Muarrat Al Noman, rich in mosaics and the town of Hama and its Museum. There, trainees could see restored mosaics, following the detailed explanation on the past restoration activities carried out over them.

The visit to Lattakia, and its beach, added some enjoyment to knowledge.

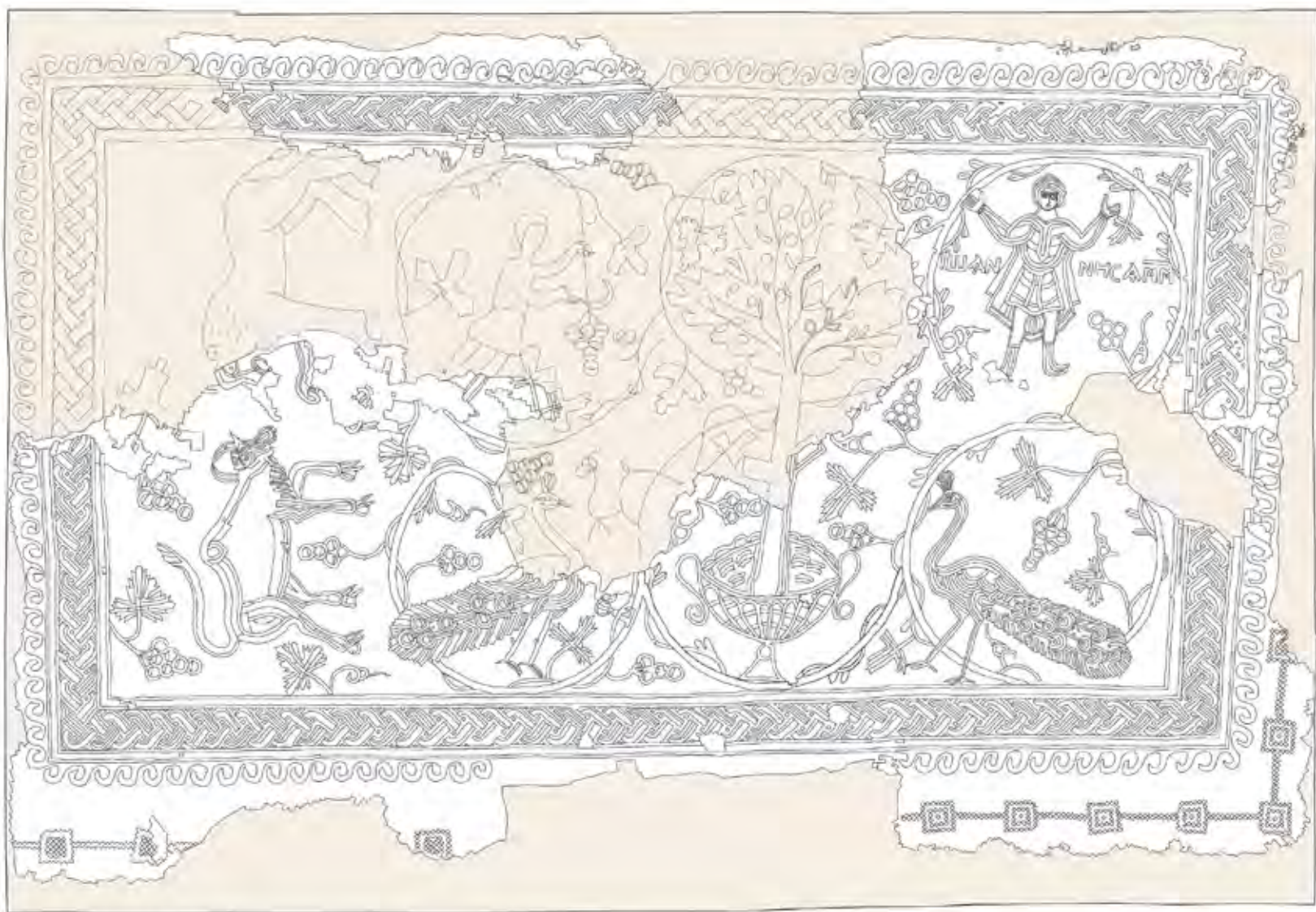


During the training in Jordan, trainees could visit, south of Madaba, the citadel of Makawer, dated to Roman period, and the Crusader castle of Karak. The visit to Petra and its Museum was enriched by the explanation about the restoration works carried out on the mosaic floor of the Byzantine church, to preserve and enhance it.

In Palestine an interesting visit was organized in Sabastiya. Trainees, together with a large group of friends and lovers of archaeology, visited the medieval town, with the Maqam/Cathedral of Saint John the Baptist and the Roman tombs and the ancient site of Sebaste, with its monuments (theatre, temples, stadium etc.)

The project also hosted some visitors, among which the students of the Al Quds University, who came to see the yard during restoration in the Coptic Church. The visits aimed to raise awareness on the richness of the Palestinian cultural heritage.

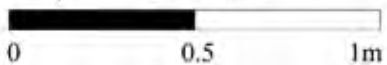




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Graphic Scale

(in meter)



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