

WALL PAINTINGS AND PLASTERS OF SİDE HARBOUR BATHS: TECHNIQUES, PROBLEMS, AND CONSERVATION METHODOLOGY

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Özet

Şehir merkezinin güneyinde, birinci limanın kuzeydoğu köşesinde yer alan hamamın halen büyük bir kısmı ayakta. Roma dönemine ait yapı inşaat tekniği bakımından M.S. 2. yüzyıla tarihlendirilmektedir.

Turistik işletmeler tarafından çevresi kuşatılmış ve yakın zamana kadar çöplük olarak kullanılmış olan yapının kazı ve restorasyon çalışmaları Kültür Bakanlığının izniyle SAYKA İnşaat Firması tarafından 2003 yılında tamamlanmıştır. Hamamın içindeki sıva ve duvar resmi kalıntılarının korunmasına yönelik çalışmalar ise, bir proje kapsamında, Ankara Üniversitesi Başkent Meslek Yüksekokulu, Restorasyon-Konservasyon Programı tarafından 16 Aralık 2002 – 5 Şubat 2003 tarihleri arasında gerçekleştirilmiştir.

Duvarları ve üst örtü sistemi kısmen yıkılmış olan yapının sıva, duvar resmi ve mermer kaplama gibi dekoratif unsurları büyük ölçüde tahrip olmuş; buna rağmen özellikle bazı mekanlarda inşaat tekniği ve dekorasyonu bakımından önemli ayrıntılar sunan kalıntılara rastlanmıştır. Proje ile, en azından, mevcut kalıntıların in situ konumlarını kaybetmeden korunması amaçlanmıştır; bu doğrultuda kirli yüzeylerin temizlenerek orijinal renklerinin ortaya çıkartılması, sıva harç ve/veya sağlamlaştırıcı enjeksiyonuyla sıva ve boya tabakalarının taşıyıcı yüzeye bağlanması, yarık ve çatlakların doldurularak güçlendirilmesi gibi çeşitli koruma yöntemleri uygulanmıştır.

Liman Hamamı'nın değişik mekanlarında gerçekleştirilen konservasyon çalışmaları sayesinde, yapının orijinal dekoru hakkında fikir verecek bilgilere ulaşılmıştır. Bazı mekanlarda farklı dönemlere ait çok katlı sıva uygulamalarıyla karşılaşmış; yapının ilk ve sonraki evrelerine ait boyalı dekorasyon kalıntıları ortaya çıkartılmıştır. Bunlardan ilk kat geometrik bir kompozisyon içermektedir. Desen açık renk (beyaz) zemin üzerine siyah ve kırmızı şeritler ile oluşturulmuştur. Birinci kat sıva üzerinde yapım aşamasına yönelik ip (tel) izlerine rastlanmıştır. İkinci kata ait boyalı sıva kalıntıları ise birkaç noktada küçük alanlarda günümüze ulaşmış olup, kıvrık dalı hatırlatan motif kalıntıları bitkisel içerikli dekorun varlığına işaret etmektedir. Küçük alanlarda çok dağınık bir görüntü ortaya koyan bu kalıntılar, orijinalinde bütün mekanların duvar resimleriyle bezeli olduğunu belgelemektedir.

İç mekanda gerçekleştirilen bütün bu koruma çalışmalarına paralel olarak, yapının restorasyon projesi kapsamında, drenaj ve giydirme çatı uygulamaları da tamamlanmıştır. Böylece zeminden ve örtüden gelecek su filtrasyonuna karşı gerekli önlemler alınmıştır. Ancak bu koruyucu çalışmaların kalıcı ve sağlıklı olmasını sağlamak için bakım ve kontrollerin periyodik olarak tekrarlanması gerekmektedir.

The bath is located to the south of the city centre, at the northeastern corner of the first harbour. The bath is from the Roman Age and date to the 2nd century A.D., according to its construction technique.¹ The

walls and superstructure of the bath are partially collapsed; the decorative elements such as original plaster, wall paintings, and marble covering are highly deteriorated. However, especially in some places, some artifacts have been discovered that yield important information regarding construction technique and decoration.

¹ For a more detailed information on the bath see. Mansel 1978, 215-221.

The excavation and restoration work on the building were completed in 2003 by SAYKA Construction Company under the supervision of Side Museum². The work to conserve the plaster, wall paintings, and marble coating in the baths was undertaken within the scope of a project between December 16, 2002-February 5, 2003 by Ankara University, Başkent Vocational School, Restoration-Conservation Program³.

The inspection, documentation, and conservation work can be described under the following main headings:

I- APPLICATION TECHNIQUE

The interior walls of the building were laid with rubble stone and rough masonry. The surfaces of the walls carrying the paintings were covered with mortar (arriccio), plaster (intonaco), and fine finishing plaster (intonachino) layers respectively. The paint was applied on this final finishing plaster. It is hard to form an opinion on painting technique. The samplings for the necessary archaeometric analysis that will suggest an idea on this matter have been conducted, but the study has not yet been concluded⁴. In some places,

an application of the second painting layer from later periods is visible (Fig. 4). The thickness of mortar varies between 2-5 cm, that of the plaster is 4-6 mm and that of the finishing plaster is 1-2 mm thick according to the evenness of the wall surface⁵. On the plasters, paint remnants in different colours (white, red, black, green) were discovered after the cleaning process.

Traces of a rope (or a thread) that reveal information on the application technique were uncovered on the first layer of wall paintings, which have been brought into light through the cleaning process (Fig. 5). From these traces, it is understood that the surface is first divided into equal squares (18x17 cm) with thin bands in vertical and horizontal directions and in this way, the sketch drawing (design) is transferred on the wall without causing an error⁶ (Fig. 1).

II- DETERIORATION

Since the building was exposed to the external factors, various forms of deterioration have been observed on the surviving plaster/painted plaster remnants. These can be listed as follows:

² The excavation, cleaning and restoration work on the building were carried out between the years 2001-2002 by SAYKA Construction Company under the supervision of Side Museum with the permission of the Ministry of Culture. These studies towards conserving while consolidating the current situation revealed the original background of the places; structural consolidation, isolation, and new protective roof are applied on the walls and on the wall laying system.

³ In accordance with the agreement between Ankara University and SAYKA Construction Company, the project was carried out under the direction of Asst.Prof. Bekir Eskici, Ankara University, Baskent Vocational School, Restoration-Conservation Program, by a team of six experienced conservators and workers under the supervision of Dr. Y. Selçuk Şener and Ayşe E. Gültekin. We thank conservators Kurtuluş Türk, Didem Taner and Mine Çetinel for their generous work as team members.

⁴ Paint, plaster, and mortar samplings have been collected for archaeometric analysis, but the study has not yet been concluded.

⁵ In Antiquity, the main elements named preliminary layers of wall painting were composed of mortar (arriccio) and plaster (intonaco) layers; sometimes a fine finishing plaster (intonachino) was added. The thickness, quantity, and composition of the layers varied according to time and to wall technique. Swindler, 1929, 417-431; Botticelli 1980, 11-13; Mora-Mora 1984, 10-16; Monnier 1989, 78-79; Schwartzbaum 1995, 192; Baglioni-Dei, 1997, 43-44; Barbet-Allag 1997, 12-13; Stefanaggi, 2001, 29-45.

⁶ Dividing the surfaces into squares (quedrettatura) is a method for transferring the sketch drawing on the plaster. It is especially hard to transfer a real-life drawing onto curved or big dimensioned surfaces. Therefore, a small dimensioned sketch of the desired drawing, divided into squares, is prepared and this squaring is repeated on the surface of the plaster with the desired dimension. With the formed system, the scaled drawing is magnified and transferred onto the wall. This arrangement on the plaster was usually obtained with lead wires and compass in Antiquity. Mora- Mora 1984, 15; DIMOS 1986, 26-28; Barbet-Allag 1997, 35 fig. 33b; Barbet 2000, 171, Fig.2.

1- Flaking between the carrying (wall) and mortar and/or plaster: In most places, decomposition causing detachment and powdering between the layers has occurred due to the effect of the water in liquid or vapour form seeping through the wall. This situation has resulted in a high degree of erosion on the covering and on the areas close to the ground where the humidity is most concentrated⁷.

2- Deposition of dust, dirt, and calcareous sediment: In addition to the dust, earth, and polluting materials in the environment calcareous layers were formed on the plaster and on the painted surfaces as a result of crystallization of soluble and/or insoluble salts⁸.

3- Microbiological pollution: Micro organisms such as algae, fungi, and lichen covered the original surfaces to a large extent especially in humid places.

4- Capillary and deep cracks: The plant roots coming through the wall have caused capillary and deep cracks on the plaster mostly in the places which were open to the external factors.

5- Surface powdering: The above mentioned physical, chemical, and biological factors have caused the paints to powder in layers from the plaster surfaces in most places⁹.

6- Covering plaster and notches: Imposed painting and/or plaster layers from different periods have been found in some places. The lower painting surface was notched in order to obtain a better fixation of the new upper plaster layer. The original painting surface was damaged during this process that was applied with blows of a hammer¹⁰.

III- CONSERVATION WORK

It is possible to list the conservation work that was done according to the above mentioned different deterioration types under the following sub-headings:

1- Cleaning: The light dirt such as dust, earth, and mud were removed first with soft hair brushes and then with damp sponges. Chemical methods were used in cleaning of hard calcareous layers formed on the surfaces by deposition of salts insoluble in

⁷ One of the main problems faced in conserving the wall paintings is the exposure of the building or building remains, to which they belong, to the external factors (rain, humidity, wind, sun etc.) and decomposition between wall-mortar-plaster-paint layers. In the buildings without sufficient drainage and roof isolation, powdering between the layers has occurred in time due to the destroying effect of the water (liquid and/or vapour) seeping through the ground, wall, and roof, and if the necessary measures are not taken this results in excessive losses. Botticelli 1980, 13-15; Mora-Mora 1984, 165-171; Arendt 1987, 29-40; Accardo 1989, 21-30; Arnold 2001, 113-121.

⁸ As a result of vaporization of the water seeping through the ground and the roof with changes of climate and heat, the carried salts crystallized on the surface and formed a hard and a thick layer depositing in time. Evaporation and crystallization sometimes occurred in the pores. The pressure of the salts formed in the pores weakened the plaster and paint layers in time. Mora-Mora 1984, 178; Arnold-Zehnder 1987, 103-135; Arnold 2001, 115-117.

⁹ One of the factors of the deterioration of the wall paintings is biological factors. Undeveloped plants (algae, fungi, and lichen) that find a convenient environment to reproduce with the existence of humidity, heat, and light sources form a shell on the surfaces in time and the acid secreted through their deep penetrating roots causes physical and chemical damages. Caneva-Nugari 1991, 92-98; Jeffries 1991, 287-293; Giacobini-Pedica 1991, 275-286; Torraca 1988, 49-51.

¹⁰ Multi layered (imposed) painting application due to maintenance-restoration requirement, changing period characteristics or to other reasons is mostly seen at the buildings which are used for similar or different reasons at various time slices. In these applications, instead of completely destroying the lower plaster layer, the fine plaster which is more suitable for the new painting surface is applied on the current one due to practical reasons. The lower painting surface was usually notched during this procedure in order to obtain a better fixation of the upper plaster layer. Mora-Mora 1984, 213; Alberti-Arké 1998b, 56-58; Şener-Eskici 2002, 114.

water. A solution of EDTA¹¹ (ethylene diamino tetra acetic acid) that was prepared in water in various proportions (5-10 %) was mixed with paper pulp to form a paste and then was applied over these surfaces¹² (Fig. 6). The cleaning was then done with bistouries and damp sponge; the solution remnants over the surface were removed thoroughly with water.

Micro organisms (algae, fungi, etc.) were covering all the surfaces, at areas where humidity is concentrated. These formations which severely damage plaster and painting layers were cleansed from the surfaces first with brush and bistouries (Fig. 7-8). These areas were then disinfected with hydrogen peroxide¹³ (30 %). The subsequent application was to spray a solution prepared with water in a 1:1 proportion over the surfaces¹⁴.

After the dirt and algae were removed from the surfaces, paint remnants which belong to the original decoration were brought into light on many areas. The dirt layers covering them were carefully cleaned with diluted alcohol.

2- Consolidation: One of the important conservation problems of the building is that the remains of the wall paintings of which very few survived face the risk of powdering. Acrylic resin (Primal AC33¹⁵ in water 20 %) was injected to consolidate the flaked plaster-mortar layers (Fig. 9). The wide and large lacunae between mortar-wall were filled with hydraulic lime-based liquid mortar (Malta 2002)¹⁶. Thus, the plaster that

when they find convenient environmental conditions. For this reason, the building or building remains should be isolated from environmental factors, heat, light, humidity controls should be obtained against the biologic attack. Mora-Mora 1984, 298; Caneva-Nugari 1991, 127; Pietrini-Ricci 1991, 353.

¹¹ EDTA is a water soluble weak acid. It is used in the conservation area especially for cleaning dirt, soot, and calcareous layers deposited on the surfaces of materials of inorganic origin. Clydesdale 1990, 26; The Conservation Unit 1992, 122-123; İşler 1995, 184.

¹² The liquid solution must stay on the surface for a certain time to form a reaction with the layer to be eliminated. Absorbent materials such as paper dust, carbosimetilcellulosa (CMC), and clay are usually used for this process. Thus, the solution is turned into gel and applied to the surface by using wrapping method. According to the type and density of the layer to be cleaned, the solvents can be used alone as well as special solutions obtained by mixing various materials in certain proportions can also be applied. Mora-Mora 1984, 342; Colalucci 1987, 72; İşler 1995, 184; Peterson 2001, 28; Borgioli 2001, 64.

¹³ Hydrogen peroxide (H₂O₂) is a slightly poisonous, antimicrobial solution of inorganic origin which is produced in water with various densities. In the conservation area, it is especially used to remove algae and lichen formations on different materials. Clydesdale 1990, 30; Caneva-Nugari 1991, 134; Albini-Cobau 1996, 5.

¹⁴ Different bactericides and/or biocides are used to cleanse micro organisms like mold, fungi, algae which cause a great problem in conserving wall paintings. However, it is not very probable to remove these completely with simple cleaning methods. It is probable for them to reproduce again

¹⁵ Primal AC33 is an acrylic emulsion and it is diluted with water in various proportions to be used in conservation area for consolidation and surface cover. Because of its high penetration capacity and adhesive power it is preferred mostly to consolidate mortar and plaster in the wall paintings. In the conservation of the wall paintings, different materials of organic and inorganic origin such as lime water, barium hydroxide, casein, animal glue were formerly used to consolidate plaster-paint layers. Because of the negative results of these materials like microbiologic activities and colour variations on plaster and paint layers injectable modern polymers, polyvinyl alcohol, polyvinyl acetate and acrylate type resins are widely applied recently. Mora-Mora 1984, 224-236; Özil 1990, 506; Dangas 1995, 177; Alberti-Arké 1998a, 65; Hemgren 2001, 10-11; Peterson 2001, 25-29.

¹⁶ These kind of hydraulic lime-based materials containing various minerals like pozzalana and silica are widely used in recent years in the area of wall painting and mosaic conservation due to their functional and practical characteristics such as easy usage, rapid hardening, high mechanic/adhesive power. They can be found in the market under different commercial names such as Ledan TB1, TB2, TB3, Ledan D1, D/F, SMS, Malta 6001, 6002, 6009. İşler 1995, 183; Alberti-Arké 1998a, 63-65; Barbet et al. 2000, 7; Asp 2001, 39-44; Suneson 2001, 45-51; Vazio 2002, 30.

was about to fall down were fixed to the wall. Methacrilate resin (Paraloid B72¹⁷ in acetone 3-5 %) was used to consolidate the weakened painted surfaces.

3- Revealing the original decoration:

In some places, multi layered plaster application from different periods were discovered. In Room VII (at the north of the caldarium)¹⁸, it is understood that the upper unpainted plaster layer which covers the original decoration was made in recent times (Fig. 10). This covering plaster which does not have an archaeological and aesthetic value was carefully removed with bistouries, small chisels and perforating tools¹⁹ (Fig. 11).

Thus, the remains of painted decoration on the southern wall of the area from the first and from the later periods of the building were revealed (Fig. 12). Unfortunately, only an approximately 1 m² part of this painted decoration has survived (Fig. 1). The first layer of this consists of a geometrical composition²⁰ (Fig. 2). The design is formed

with black and red bands on a light (white) background. The plaster remains of the second layer survived at some spots on very small areas. Contrary to the first layer, remains of the motif which resembles a curved twig and painted on light background with black gives evidence for the presence of a floral decoration.

4- Filling of the edges, lacunae and cracks with lime mortar:

The cracks and lacunae on the surfaces of the plaster were first consolidated with Primal AC33. Then they were covered with lime mortar²¹, which is suitable regarding the surface colour. In these areas, finely sieved brick dust in various colours was added to the more liquid mortar. The powdering edges of the plaster were consolidated with mortar. Small brick particles, which are suitable for the material, were added to the mortar.

IV- CONCLUSION

Some information on the original decoration of the building has been obtained through the conservation work carried out on different areas of the Harbour Baths. Paint remains in different colours (white, red, black, green) are visible on the plaster layers, which cover the interior walls. These remains which display a scattered scene in smaller places confirm that all the rooms were originally decorated with wall paintings. However, it is hard to decide to which period

¹⁷ Paraloid B72 is a polymer type methacrilate resin and it is used in conservation area for consolidation and surface cover (varnish) was used to consolidate the weakened painted surfaces by dissolving in different solvents such as acetone, toluene, thinner, xylene, butanol, trichloroethylene in various proportions. It is preferred in wall paintings and in consolidating paint layer because of its reversible, heat-light actions resistant, ideal aging time and high penetration characteristics. Mora-Mora 1984, 232-238; Colalucci 1987, 72; Özil 1990, 506; Clydesdale 1990; Shashoua 1992, 113; Dangas 1995, 177; Alberti-Arké 1998a, 60

¹⁸ Mansel 1978, fig. 243.

¹⁹ It is vital to conserve on site the multi layered painting layers which are made in different time slices at the same building due to changing period characteristics and/or to various reasons changing period characteristics or to other reasons. In Harbour Bath, the second layer painting remains which carry these qualities are conserved, but a third unpainted plaster layer is removed in order to reveal the original elements.

²⁰ Although the composition does not expose a homogenous completeness, it is understood that the design is composed of octagonal tenon forming

squares at the centre. The similar to this original decoration which will contribute to the dating of the building is also seen on some ground mosaic samples from 1.-3. centuries A.D. centuries. Ling 1998, 53, fig. 36, 62, fig. 43. a simpler and different example of a composition formed by octagons is seen among the Ephesus Terrace House Roman wall paintings. Strocka 1977, fig. 91.

²¹ Hydraulic lime is a kind of lime produced in dust form by baking silica and clay containing lime. Contrary to the slake lime, it enters into reaction with water, not with air and hardens. Because of its known characteristics as being light, humidity and water resistant it is being used since Roman times for making mortar. Torraca 1988, 71, Giuffrediemmi 1991, 22; Suneson 2001, 45.

they belong. This can be clarified only after more detailed archaeological research has been done. However, according to the artifacts in some rooms, it is understood that the walls were originally covered with marble plates up to a certain level and in later periods these plates were removed and painted plaster (painting) was applied instead.

Parallel to this conservation work carried out in interior places, drainage and a protective roof were also applied²². Thus, the necessary precautions were taken against the water seepage from the ground and from the cover. But periodic maintenance and controls must be repeated in order to obtain the continuity and effectiveness of this conservative work.

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²² Drainage and protective roof application is a part of the architectural restoration project and is carried out by SAYKA Construction Company.

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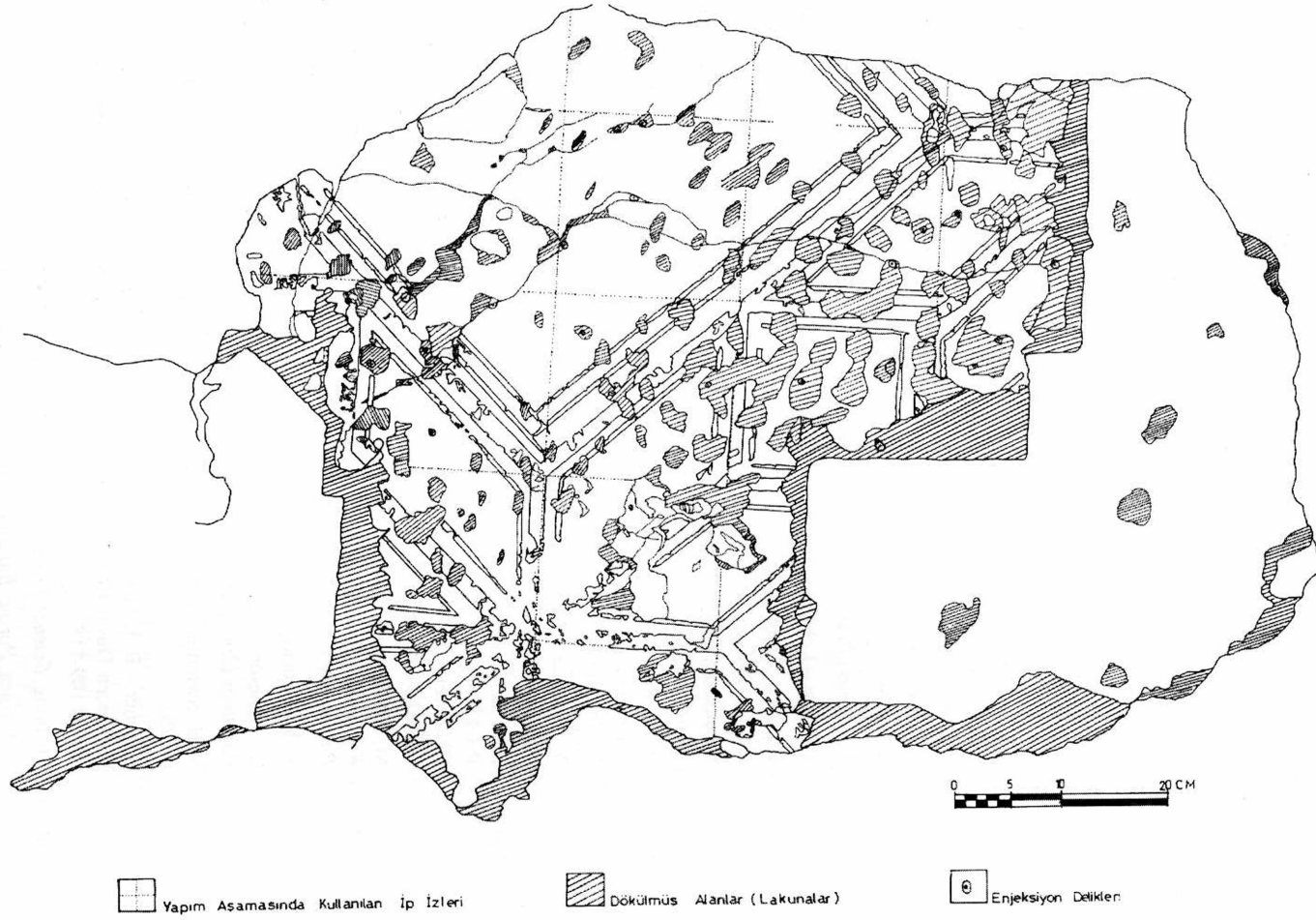


Figure 1

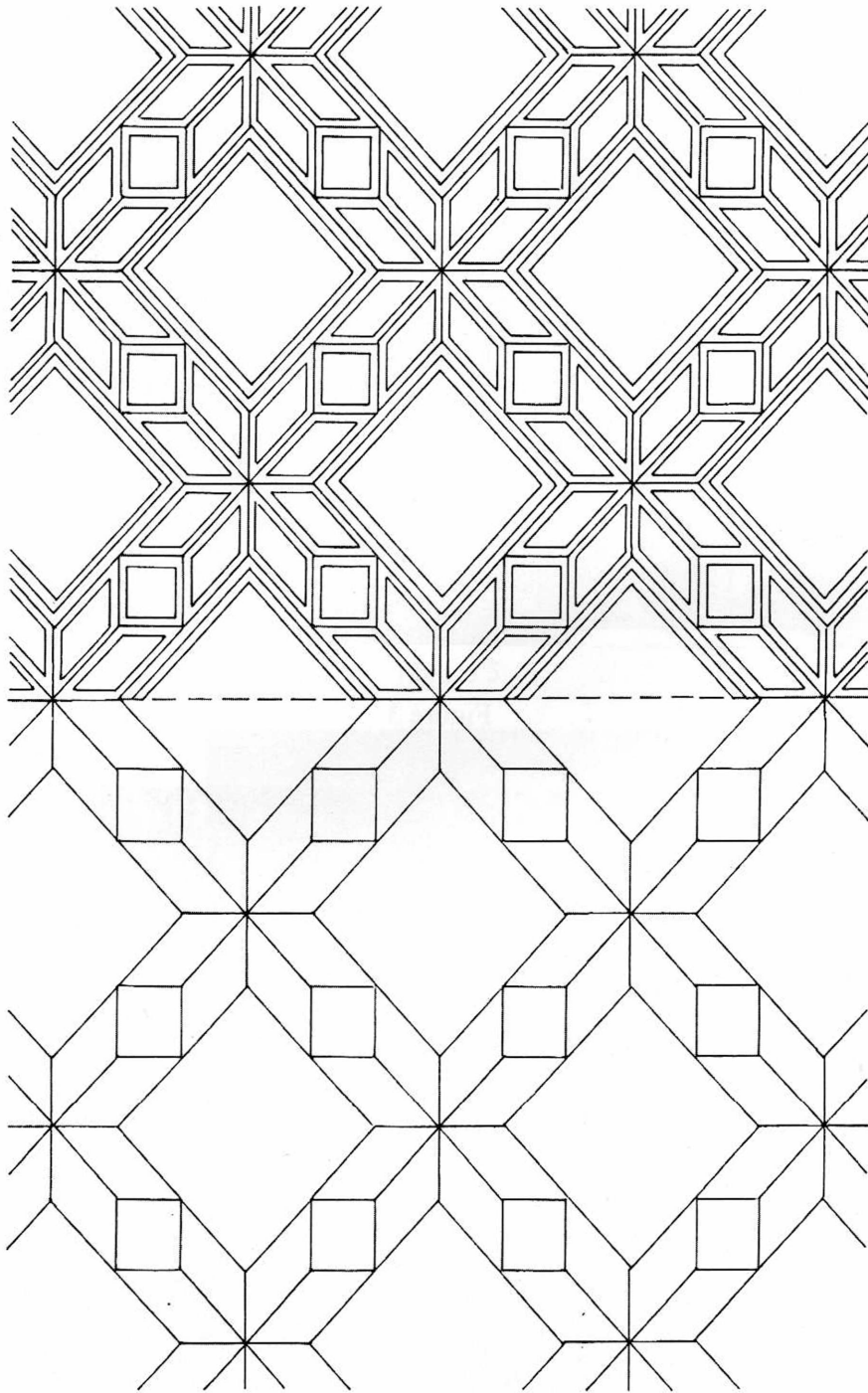
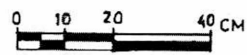


Figure 2



Wall Paintings and Plasters of Side Harbour Baths:

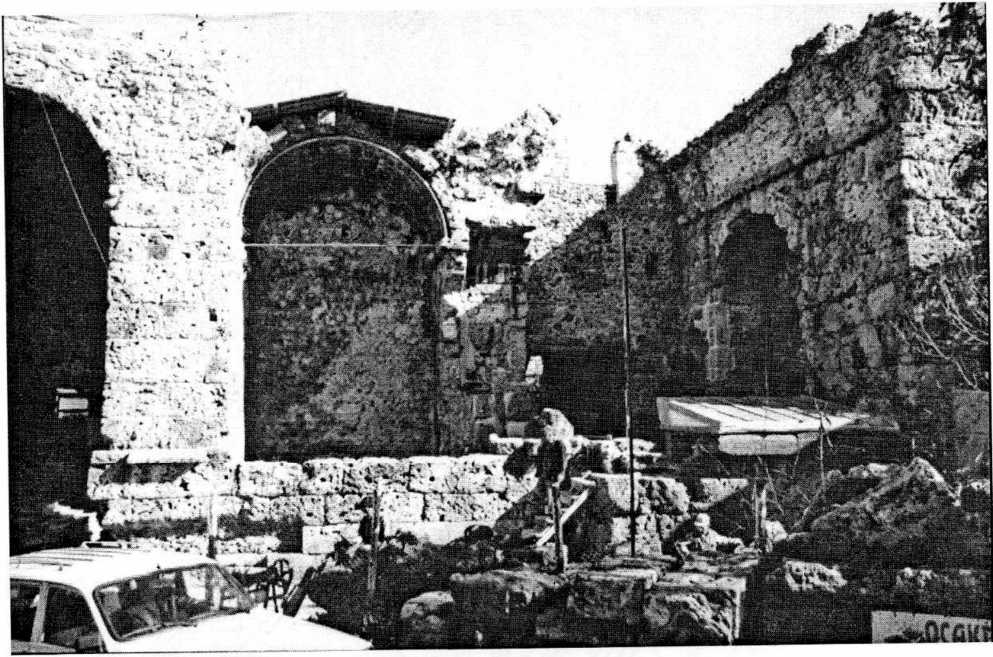


Figure 3



Figure 4



Figure 5



Figure 6

Wall Paintings and Plasters of Side Harbour Baths:

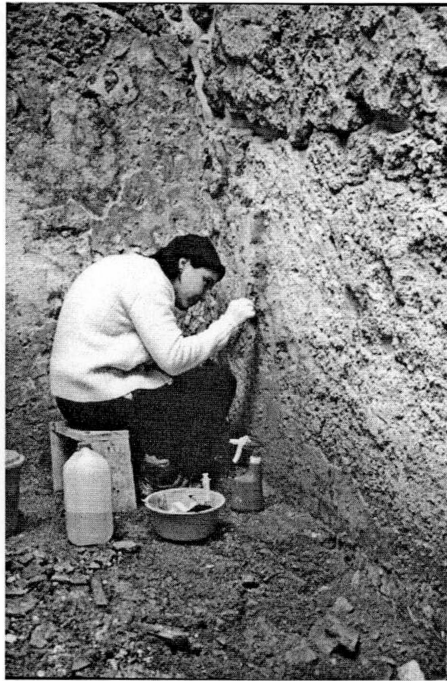


Figure 7



Figure 8



Figure 9



Figure 10



Figure 11

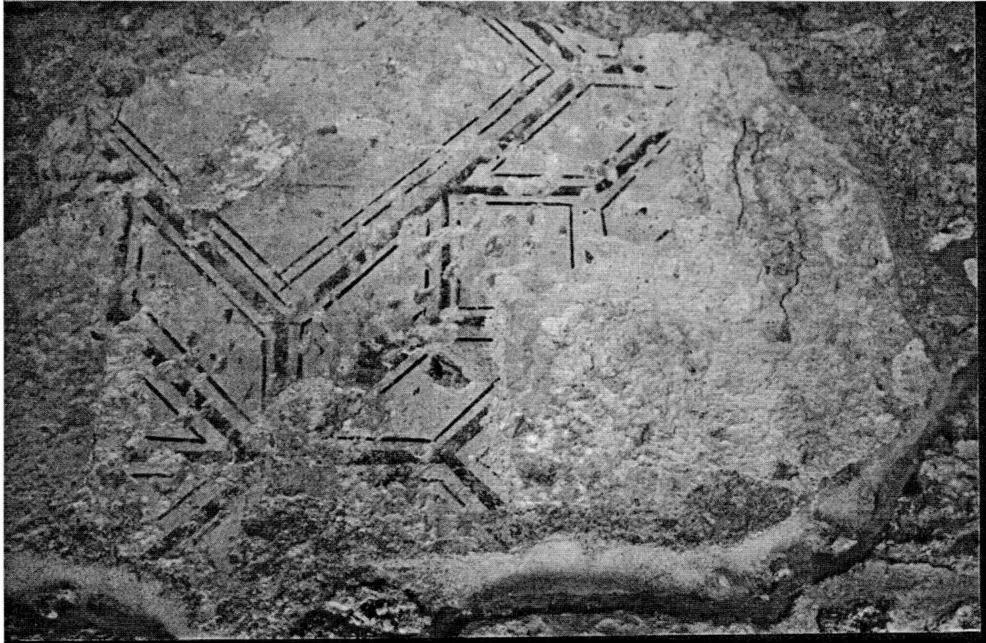


Figure 12



Figure 13