Figure 1 Aleppo Room (Aleppo Room)

Ajami panels in Syria

An examination of creation process

ABSTRACT

Examination of Ajami wall panels used in the middle east during the 15th century and beyond. Focus on the creation processes and supplies employed in creating these panels in the region of modern-day Syria.

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Contents

Introduction

This project in an examination of process used to decorate the Ajami room panels found throughout the middle east during the 17th century and beyond, emphasizing those found in Syria and the unique design styles used there. I do not attempt to re-create an exact extant panel, but instead focus is on the process, techniques, tools, and materials used, and how to recreate this process with considerations taken for modern safety.

My approach to arts and sciences is to make it as accessible as possible and show that perfection is not the starting point and likely cannot be achieved, but instead the journey is where the excitement is. Failure or even a first try should not be looked at with embarrassment, but instead as a starting point on an amazing journey. This ideal shaped this entry.

Several years ago I had recently chosen my persona name and location, and I was curious as to what some of the art forms that were unique to that area. At the time there was a (and continues to be) conflict in the Syria region and the heritage communities in that area were working to preserve the Ajami rooms and the creation process, leading to several articles which I found and used in my original attempt using only light research and modern supplies. That piece continues to grace my house as a reminder of where I started my journey into the artistic world.

My artistic journey led me down different paths over the next eight years since that piece, but each new tool or technique I learned built my knowledge and I began to find threads linking these items. My growing love of Iznik pottery deepened my research into Ottoman and middle eastern designs and colors, scribal classes taught about the materials used, bookbinding increased my comfort with hide glue.

With each of these new pieces of knowledge I began to look back at that original project and began to think “what if I tried again using what I know now.” The final push was a conversation with a new artisan who had begun researching and trying a new technique and was frustrated that their attempts were not as good as other artisans. I brought out my original project and showed them my first attempt at art. This began more discussions on how secondary research can grow your main art form. They left the conversation I hope inspired and given hope that it will get better, and I with the desire to revisit that original topic using the techniques and tools I had gained.

Ajami Definition

There are several names for this decorative technique including Khashabiyat madhuwna (painted wooden wall panels), Damascene paint (as some believe Damascus was the craft’s origin), Painted Wood, and ‘Ajami (Korinth). For this project, I will be using the term Ajami as it has been found linked to this decorative technique in several of the books and papers on the topic and has been referenced in contracts dating back to the 17th century. The word Ajami is an Arabic adjective which means anyone who is not Arab and was most used in reference to the individuals in the Persian empire, though could be applied to any culture.

‘Ajami is a technique where wooden panels are elaborately decorated in a relief technique and applied to the walls and ceiling in a room to form a cohesive or complementary theme. This

decorative style was popular across much of Syria prior to the 18th century with extant rooms still in existence in Aleppo and Damascus.

There are two types of ‘ajami decorative techniques (Scharrahs, Damascene 'Ajami Rooms Forgotten Jewels of Interior Design)

1. Hariri (silken): The application of the colored pigments directly onto the treated wood which produces flat one-dimensional image
2. Nabati (vegetal): Paste is applied to the treated wood and then gold leaf and pigments are applied to the flat and raised areas resulting in a multi-dimensional effect. (Rami Alafandi)

Domestic Architecture of Syrian houses

Layout of the existing historic homes are as follows: upon entering the house, the visitor passes first through a small secondary courtyard or corridor which separates the view from street to the private inner courtyard (Juwwani) which forms an open-air oasis. Off of this courtyard is a large room called a qa’a-which could serve as a multi-purpose room during the day as a living room/salon and to greet guests and entertain but during the evening may function as a sleeping area. As a formal reception area, attention was given in lavish décor in the form of Ajami decorations and display shelfs for their most prized possessions.

The qa’a rooms are separated into two main sections: the ‘ataba, which is generally at the same level as the courtyard and paved with stone. It was in this area where visitors were first received, shoes removed, drink and food were prepared. This area usually occupied between one quarter and half of the room. The second part of the room was the Tazar. This part of the room was usually on a riser to sit higher than the Ataba and serves as the reception and sitting area of the room. The riser made of stone or wood and was often covered by carpets and contains seating cushions lining the walls. The walls in both areas of this room could be highly decorated giving the room a lavish yet comfortable feel for guests (Daskalakis Mathews).

Figure 2 View from the Tazar to the ataba (Avenue)

RECEPTION ROOM OF A DAMASCUS HOUSE.

Showing the lower portion of it only, with its fountain and marble pavement. The upper part of the room, where guests are received, is eighteen inches higher, and is furnished with cushions and carpets. An incense burner is standing at the extreme edge of the dais.

Figure 3 Reception room of a Damacus house (Wilson 182)

Horizontally the room is organized in four distinct planes: floor, lower walls, upper walls, and ceiling. The floors use inlaid stone and if exposed the stone was often arranged to form various geometric patterns, if covered by wood or rugs it may be plain or elaborate depending upon the type of rug used.

The lower wall zone of both 'ataba and tazar contain elaborately ‘Ajami decorated wainscoting, with doors, windows, cupboards, and masab (ornamented niches) all starting at approximately the same level and maintaining a consistent height. The upper wall zone is left often undecorated except for windows which could contain colored glass and were arranged to catch the light at different times of the day to change the mood of the room. This break in decoration serves to separate the two most heavily embellished parts of the room, the paneling on the walls and the ceiling. The ceiling is often as decorated as the lower wall, with cornices providing additional depth of surface. The uniformity, on the various levels together with the clearly separated zones of the room serve to give a sense of the different horizontal layers allowing each to be viewed independently of each other. (Daskalakis Mathews).

Figure 4 Masab (Avenue)

Existing houses

Due to continuous renovation and rebuilding of homes, devastating earthquakes (over 181 earthquake events effecting Syria and its neighboring regions from 1365 B.C to 1900 A.D (MOHAMED REDA SBEINATI)), its turbulent past, and even modern conflicts many of the houses employing this technique have been lost to time. Dated examples from the fifteenth to the seventeenth centuries are rare with most of the 200 to 300 houses found in Damascus today being created between 18th and 20th century. The oldest dated 'ajami decorated interiors in Damascas are found in the entrance hall of the Tawrizi mosque, dated to 1420 AD and a ceiling of the Bayt Al-Aqqad dated to AD1470 (Scharrahs, INSIGHT INTO A SOPHISTICATED PAINTING TECHNIQUE: THREE). The oldest known complete surviving room using this decorative technique is from Aleppo and is dated from AD 1600-1603 and is currently housed in Berlin Germany at the Museum of Islamic Art at the Pergamon Museum.

Materials

Various materials used in the process re-creation of the Ajami panels will be covered in this section. Historically accurate materials will be emphasized and when possible, these materials have been used when testing the recreation. In the case where historic is not used it will be noted as to the reason and the substitute used was chosen.

The materials are discussed in the order of the layer at which they were used in the creation of the panel beginning with the wood layer through the paint/pigments.

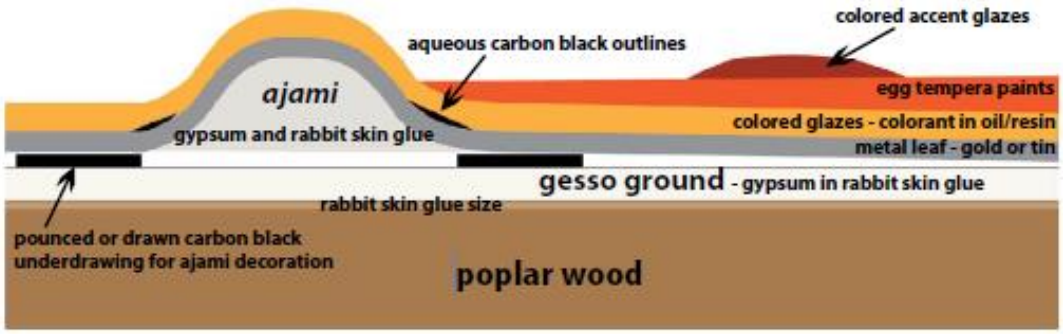


Figure 5 General layer sequence (Fair, Lauren)

Wall panel Material

The walls and ceilings of the Ajami decorated rooms were primarily constructed out of wood. This wood formed the base layer of the Ajami panels. Due to Damascus' climate, the city is surrounded by green belts in the area known as the Ghouta, making it a renewable material that is easier and less expensive to harvest, shape, and decorate than stone.

Examination of wooden elements from Ajami rooms such as the Nur al-Din housed at the Metropolitan museum of art, and the Aleppo Room in Berlin have found wood from various sources including poplar, cypress, black mulberry, walnut, box tree wood, cedar, terebinth, and wood from the family Rubiaceae (Mechthild Baumeister) (Scharrahs, INSIGHT INTO A SOPHISTICATED

PAINTING TECHNIQUE: THREE) (Scharrahs, Damascene 'Ajami Rooms Forgotten Jewels of Interior Design).

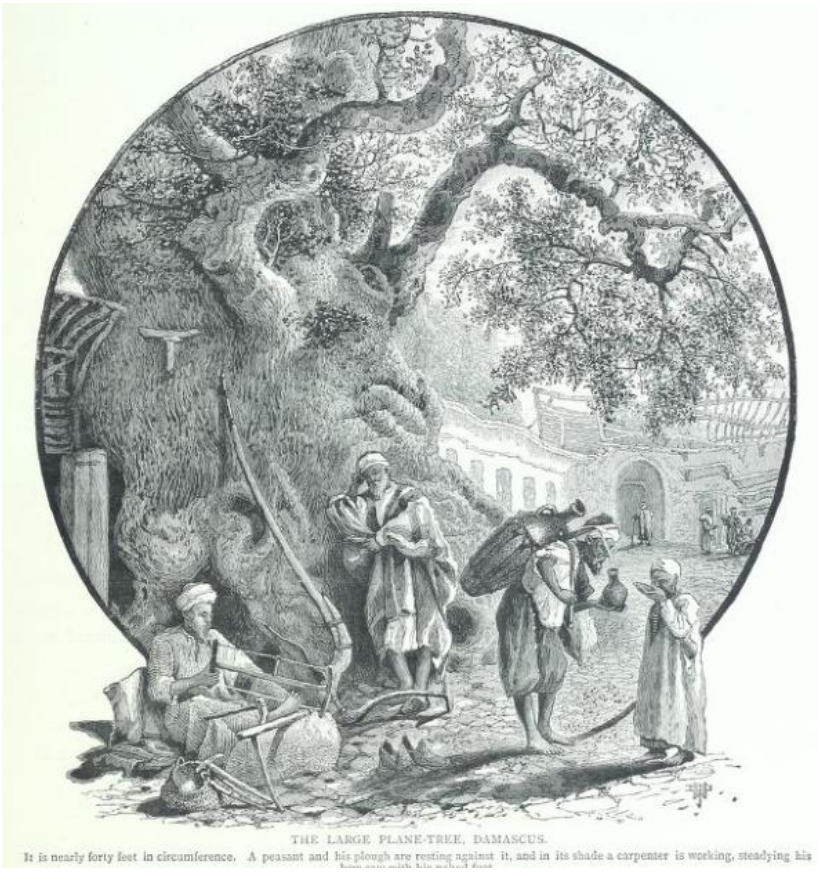


Image of a tree recorded in 1880 (Wilson 168)

Local wood availability and cost was considered when choosing the wood for this project. Due to the nature of an experimental process and need for multiple rounds of experimentation Hardwood plywood was used for the phase test pieces. This plywood was made from a combination of birch , maple, and oak with the makeup varying depending upon the manufacturer and availability of resources. These were used for the initial process experiments. As the process experiments began to yield positive complete results pieces of poplar were used to test the overall process as they were the most readily available, with the exception of walnut, as my research indicated walnut usually used for shutters and other decorative elements more so then the decorative panels. (Scharrahs, INSIGHT INTO A SOPHISTICATED PAINTING TECHNIQUE: THREE)

Spacing between the boards would either be left untreated and simply painted over, or were filled with organic material such as paper, hemp, or cloth strips applied with animal hide glue (Scharrahs, Damascene 'Ajami Rooms Forgotten Jewels of Interior Design). For the process experimentation hemp fibers were used to fill in holes and linen cloth used for the spacing between the boards.

Gesso Ground

The second layer could either be animal hide glue or a gesso ground created by mixing gypsum and hide glue. This layer was necessary to ensure that the paint and glaze not only had a bright reflection and smooth layer but also serves to seal the board preventing the mediums to enter in the boards pores over time effecting the look and structure of the boards.

Animal hide glue is created by trimming animal hide into small pieces. These pieces are then boiled in water for several hours until the pieces become translucent. The pieces are then removed and the remaining water is boiled until it begins to thicken and the glue is made. This glue can then be used immediately or air dried in small pieces and then ground for later usage (Guerin).

For this experiment I used commercially available rabbit-skin glue. I found it to be more refined and provided the smoothest flow creating the least number of lines in the Gesso.

Raised Motifs or Ajami

Samples were taken from various parts of the room and found that the decorative techniques in these rooms involved two main methods. The first involved raised motifs and the second was flat motifs.

For the raised motif, the gesso would be covered with a thick mixture of hide glue with gypsum (or ocher if the next layer would be metal leaf). This mixture was applied where raised motifs were to be present (Daskalakis Mathews).

These materials were used in the process experimentation.

Metal Leaf

In many of the wall decorations metal leaf was used to provide added dimensions to the painting. Fine leaves tinfoil was the main leaf or foil used in these rooms, but Gold could be found in the room highlighting important items such as text and silver was very rarely used. Copper leaf wasn't found in rooms until the later part of the 18th century (Scharrahs, Damascene 'Ajami Rooms Forgotten Jewels of Interior Design). The gold metal and leaf would be applied on an ocher-colored ground while tinfoil would be made to adhere either through directly applying to the seize or gesso or using an intermediary preparation of gypsum and hide glue (Daskalakis Mathews).

Due to cost constraints, imitation silver and gold leaf were used for experimentation of the process.

Paint / Glaze Pigments and Mediums

Pigments

Ajami decorated rooms contain a wide variety of design motifs painted in a large variety of colors. Those found in Damascus were especially bright and vibrant as being on the trade route would have given them access to a wide variety of pigments from Asia, Africa, and Europe. Several of the common pigments found through various rooms include minium, vermilion, red lead, basic verdigris, smalt, lapis azul, indigo, orpiment, carbon black, lead white, and gypsum; glaze colorants

include aloe (yellow/orange), verdigris (green), lac, and cochineal (red) (Lauren Fair) (Mechthild Baumeister) (Julia Schultz) (Scharrahs, INSIGHT INTO A SOPHISTICATED PAINTING TECHNIQUE: THREE)

For the sake of this project and demonstration pieces the pigments chosen were done so with consideration of cost and safety. Pigments such as lapis azul was difficult to come by in its pigment form and can be cost prohibitive. Other pigments such as minium, vermillion, orpiment, and lead red/white are toxic and without extra caution being taken can be dangerous as well as repeated exposure can cause serious health problems.

For blue pigments/colorants I acquired indigo, ultramarine and smalt from online retailers forgoing lapis due to cost and lack of tools to safely make my own. As these blues were found in a variety of rooms and were often mixed with other colors to make secondary color, this spectrum of colors provided a good base for working with.

The main reds found in the rooms were created using minium, cinnabar, vermillion, cochniel and lac (often created from cochineal). Minium is also known as red lead is made from processing white lead. Cinnabar is created by refining mercury sulfide and vermillion is derived from cinnabar. Due to the risks associated with creation and exposure of minium, cinnabar, and vermillion I used cochnieal and made my own lac from cochniel[1]. A substitute for vermillion, which was acquired from an online pigment retailor, was used to achieve a similar color (Cadmium Orange No. 2, vermilion).

For yellow pigments/colorants orpiment was primarily used in Ajami rooms. Orpiment is an arsenic sulfide material, and as such has natural risks associated with it. I replaced raw and burnt sienna and yellow ochre which have been used for painting since B.C.E and gained wide popularity during the Renaissance (Colour Story: Sienna) and thus would have been available through trade routes to Syria during the time of creation of these rooms.

Greens were created with a mix of blues and yellows (namely indigo and orpiment) or using verdigris with items such as saffron, aloe (Vinci), and white pigments mixed in to adjust the shade (Woudhuysen-Keller). For this project to obtain a green I mixed two of the blue pigments (indigo and ultramarine) with my orpiment yellow replacement (yellow ochre, raw sienna, burnt sienna). Smalt was not used, as the main use of smalt was in as opaque of a mixture to allow the light to reflect in the glass particles, and the mixing with other colorants would not highlight that pigment. Verdigris was also used; this was sourced by creating the pigment myself. [2]

For black, ivory black or carbon black would have been used. I chose to use ivory pigment acquired at my local art store.

For the white pigments/colorants lead white, whitener (calcium carbonite), and gypsum were used. Once again, I choose not to work with lead due to safety issues. Gypsum can be used but is semi-opaque. This does not always provide the desired effect. I chose to also use calcium carbonite,

[1] Appendix A
[2] Appendix B

titanium white, and zinc oxide based upon a recommendation from someone who has studied period pigments and their replacements (Kaloethina) (Ost).

Paint / Glaze Binding media

There are various binding media which were used during this point in time to achieve different colors and effects. The media can affect the color, opacity, and how the colors interact with each other as well as determine how the art will age. The identification of the medium can be difficult due to natural degradation, environmental contaminants and the tools and techniques used for cleaning and preservation over time.

When determining which mediums to use, I focused on media that would have been available in the area and had been commonly used for similar purposes such as gilding and pigment painting focusing on wall decorations.

Egg whites and yokes have been used since antiquity as a medium for painting with Pliny the elder mentioning the use of egg whites as a medium for gilding:

> "On marble and other substances which do not admit of being brought to a white heat, gilt is laid with glair of egg, and on wood by the aid of a glutinous composition, known as leucophoron" (P. t. Elder Book 33, Chpt 20)

He also discusses this as a pigment medium:

> "Persons who use it in painting, place a coat of sand beneath; a layer on which of purpurissum with glair of egg, produces all the brilliant tints of minium. If, on the other hand, it is their object to make a purple, they lay a coat of cæruleum beneath, and purpurissum, with egg, upon it." (P. t. Elder Book 35 Chpt 26)

An Italian painter Cennino Cennini wrote a treatise in 1390 called Il Libro dell'arte specifically detailing how egg yolk was used as a binder to paint on wooden wall panels (Meagher). This lends to the credibility of this being used as a medium.

With the advancement of science more methods are being found to safely examine the media used in these art works.

A study conducted of the surface decorations of the Nur al-Din Room used

> "X-ray fluorescence (XRF) spectrometry, polarized light microscopy (PL M) and fluorescence microscopy. The composition of paints and glazes was further studied in cross-section with a combination of attenuated total reflection-Fourier transform infrared spectroscopy (ATR -FT IR), Raman microscopy, surface-enhanced resonance Raman spectroscopy (SERRS) and scanning electron microscopy (SE M) with energy-dispersive X-ray spectroscopy (EDX). Additional media characterization was carried out using Fourier transform infrared spectroscopy (FTIR), pyrolysis-gas chromatography-mass spectrometry (Py-GC-MS), gas chromatography-mass spectrometry (GC-MS), high performance liquid chromatography (HPLC) and enzyme linked immunosorbent assay (ELISA). Corrosion

products of the tin leaf were identified by X-ray microdiffraction (micro-XRD).

The Enzyme-linked Immunosorbent Assay (ELISA) is a is an Immunological or antibody-based technique that looks instead at the proteins of the sample and can distinguish between natural proteins such as (casein, ovalbumin, collagen: marker proteins for milk, avian eggs and animal tissue/bone)" (Julia Schultz).

The findings of these analyses were that the binder of the red, pink and green paint samples was of an egg-based nature. The identification of ovalbumin (the protein in egg white) in the paint samples does not indicate that the binder was whole egg, yolk or white alone, due to the difficulty of fully separating white from yolk, and the sensitivity of the ELISA method was not determinable which was a white, yoke, or mixture for the egg binder. The amount of the different parts can lead to an indicator. (Julia Schultz)

For the paints I experimented with egg binders on all the pigments used and found that dependent upon the look and opacity desired different binder worked for the different colors. Egg yolk (tempera) would often produce more of a shiny look and opacity then Egg white (glair) but not as opaque as whole egg. While glair with its more see through look would lend itself to pigments such as smalt and verdigris which contain a natural reflective property due to their glass and metallic nature. Cochineal is very ph sensitive and the yoke turned the pigment into a black color.

The binders used in the glaze were simpler to determine. FTIR and ELISA examinations indicate that the pigments in the glaze were suspended in a mixture of drying oil (likely linseed) and tree resin (Julia Schultz). For the glaze which pigments were added I first created a damar with Pine Resin and Turpentine 1:1. This damar was then mixed with turpentine, and linseed oil at 1:2:2 (damar/turpentine/oil) to create the glaze (Bevia). For an orange glaze Aloe was mixed with a ratio of 4:2:1 (oil/resin/aloe) (Lauren Fair).

Figure 6 Aloe glaze supplies

Reconstruction of the process

Steps taken in the process re-creation creation of the Ajami panels will be covered in this section. The materials used are described in the previous section, and when possible, historically accurate materials and process was followed. In the case where the process differs from that in the original, or where experimentation was done it will be noted.

The process is discussed in the layer at which they appear in the standard layer sequence in the Ajami panel beginning with the wood layer and ending in the paint/pigments, with the duplicate glaze layer addressed at its first possible occurrence.

Panel Construction

Once harvested, the wood is shaped depending upon its purpose (boards for panels and frames, pieces to form corner and other decorative elements). For large elements, numerous narrow boards were nailed either onto a wooden frame, which was then decorated in the shop and installed in the house or nailed directly the interior wooden construction and decorated onsite. The main joinery technique used was using iron nails to affix elements together to former larger elements which were then directly to the room timber wall and ceiling frames. Nails were either then hidden in the painting by covering with paint or filler material or paper or were incorporated into the design (Scharrahs, Damascene 'Ajami Rooms Forgotten Jewels of Interior Design).

As flat panels would provide an easier surface experiment, practice, and ultimately demonstrate the entire process I chose to create my stages pieces on plywood and my entire process piece on a wooden panel of poplar boards affixed together with hand-forged nails made by my husband and myself. Learning to hand forge nails proved more difficult than anticipated. I am not a metal worker and using a gas-powered forge proved difficult for me to move the metal while holding such a small piece.

While the shop making these panels may have made their own nails, but given the environment and tools needed to create this item they would have been likely to buy them from a local supplier such as a blacksmith.

Figure 7 Assembled Panel

Once affixed to the back pieces, a large hole was stuffed with hemp fibers that had been soaked in animal hide glue. Linen strips were then cut to the length of the boards and about an inch and a half

wide. These strips were then soaked in hide glue and affixed over the cracks between the boards to hide the joining of the boards.

Figure 8 Hole filled with Hemp Fibers

To demonstrate both the incorporation of nails and the hiding of nails on a piece some of the nails were covered in animal hide glue-soaked linen and others were left exposed.

Figure 9 Panel with linen applied

The linen was smoothed by hand and the panel was then left to dry until the glue had set approximately 24 hours

Gesso Ground

The design which I had created for this process piece incorporated imitation silver foil. While it was noted that a simple size could be used under the places where silver would be applied, it was also found that Gesso was used as well. To ensure a consistently smooth surface over the nails and gap filler I decided to apply Gesso to the entire layer. Since silver was being used a gesso using the traditional method of gypsum and rabbit hide glue was used to imitate what was found in several of the Ajami interiors (Lauren Fair).

The rabbit skin glue was reconstituted in water using the water to glue portions listed on the directions. The mixture was then left overnight to reconstitute forming a jelly like substance.

Glue was heated in a double boiler (being certain to not become hotter than 140 degrees F as this will break down the bonds of the glue) and the whitening agent (gypsum for Ajami gesso) is added slowly letting it soak without stirring at first. For a starting point I used the ration of 12 parts Rabbit Skin Glue to gypsum as recommended by Jackson Art (Caves). Once the glue had soaked for 10 minutes the mixture was stirred gently to reduce the number of air bubbles and let to sit again for a few more minutes to let the bubbles settle. This step was necessary to ensure that the glue being applied went on as smoothly as possible.

Figure 10 Reconstituted and heated Rabbit Skin Glue

The mixture was then applied to the entire panel in one direction ensuring to re-heat the gesso as necessary when applying as the mixture will try to solidify when cooling. This layer was then allowed to dry until there was no shine (depending on the environment this took one to several hours). The next layer was then applied parallel or crosswise to the first layer. This process was repeated until the surface was completely covered with the mixture and the cloth strips used to cover the gaps were no longer strongly visible.

Figure 11 First layer of gesso being applied

Figure 12 Panel following final layer of gesso

The layer was then left to dry for two days and then sanded lightly with a fine grit sandpaper to provide a smooth surface.

Applying the Pattern

Room designs are richly adorned with flowers, fruit bowl, cityscapes, floral, and geometric ornaments are elaborately woven in together. Elements are woven together in unique and repeating themes throughout the room providing endless scenes to review and observe.

Interwoven with these elements are inscriptions in Arabic calligraphic script. These words are artistically woven in niches, doors, windows, and throughout the panels themselves. When reading these inscriptions poetry, religious verses, wishes, and even information about the room and the artist themselves (Scharrahs, Damascene 'Ajami Rooms Forgotten Jewels of Interior Design). These words are often raised and covered with metallic foil, or bright colors on a darker background to draw the eye.

For the test patterns, several rooms were reviewed and ultimately the pattern associated with several ajami rooms shown in Scharrahs's book including a south wall of the bayt Jacques Montlucon and a plaque at the Topkapi palace for the outer boarders and fourfold design (a circle cut into multiples of four to form a star and repeated) for the middle panel. Fourfold designs are popular design and lend themselves easily to repeating patterns (Broug).

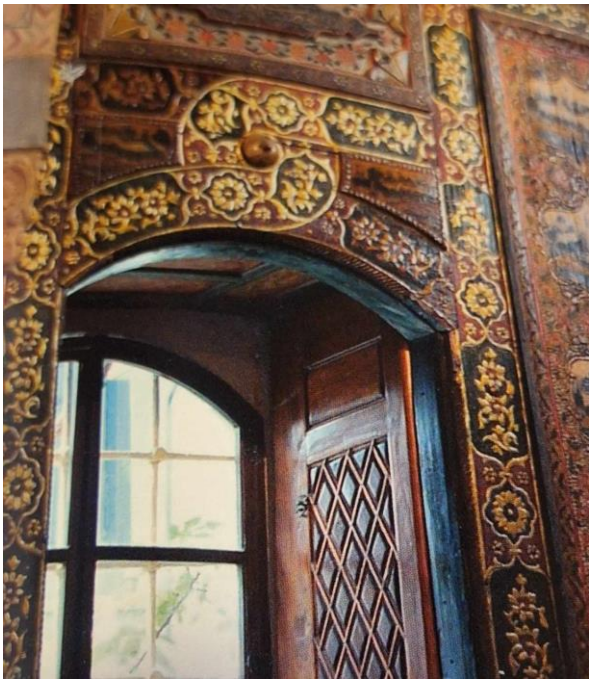


Figure 13Vayt Jacques Montlucon south wall

Figure 14 Plaque at the Topkapi Palace

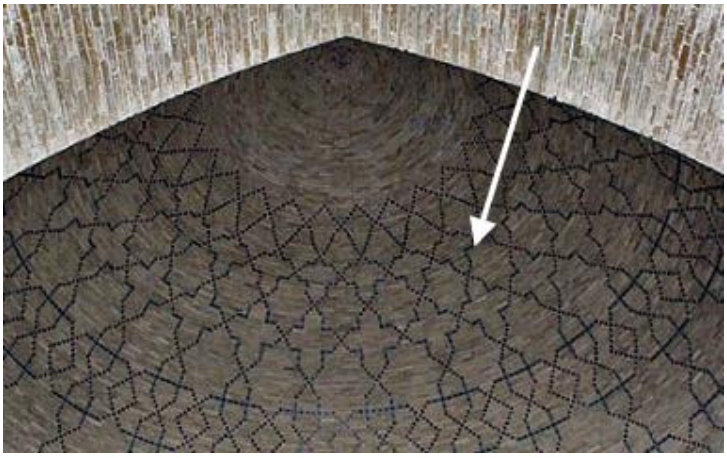


Figure 15 Minbar, Hakim Mosque, Isfahn (Hakim Jam e Mosque)

The pattern is pounced onto the panel using the following technique.

- The design is drawn on a template sheet of paper or cardboard (paper was used in this process).
- Small holes are then punched along the lines.
- The paper was then laid on the panel and graphite (used in this process) or finely ground charcoal in a bag is carefully patted over the entire pattern leaving the design on the panel.
- These patterns can be lightly traced over to provide an outline for the next steps in the process.

- The pattern is then moved forward as needed for repeating purposes and the process is repeated.

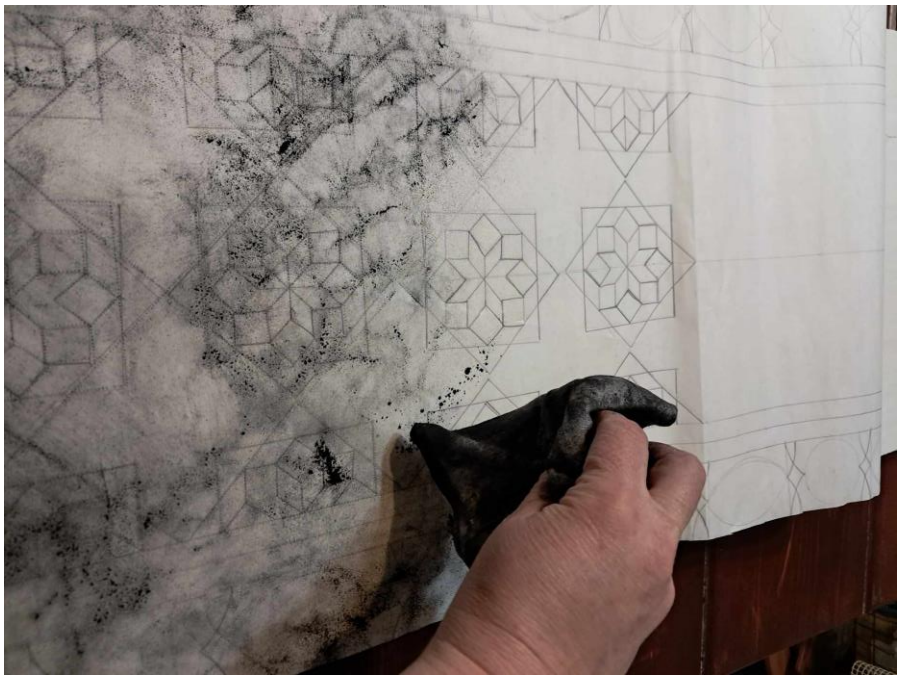


Figure 16 Pouncing pattern

Ajami layer

Once the pattern is transferred to the panel the raised areas are drawn over using a thick flowing paste called Ajami, Nabati, or Pastiglia made of animal glue (in this case rabbit skin glue), water, gypsum and sometimes a colorant such as whitening, vermillion, or yellow ochre. It is made similar to the gesso, but should be thicker. The mixture needs to allow for ease of painting while being thick enough to maintain it's shape in the design.

For the starting point I used the recommended portions outlined by Anke Scharrahs of 11% dried rabbit skin glue, rehydrated in 89 % water and gypsum added (Scharrahs, INSIGHT INTO A SOPHISTICATED PAINTING TECHNIQUE: THREE). Through experimentation of this process each time the mixture was made the ratio was needed to be adjusted slightly as the ambient humidy and temperature effects the glue.

Once the glue has curred completely (this can depend upon the ambient humidity) the foil layer can be added.

Metal Leaf and Foil layer

Metal leaf and foil play a large role in the designs of Ajami rooms. Metal sheets were applied in different thickness depending upon the surface and the desired effect with many of the raised surfaces being covered with the metals as the final layer. Foils could be applied over large or entire surfaces and then

colored glaze applied to provide a bright base. The foil could also just be localized to only highlight certain areas especially if adjoining painting would be done in an opaque paint mixture.

Different sources indicate that the leaf and foil could either be attached to the prior layer either through wetting the prior layer and activating the glue in these lower layers, or by adding an additional thin layer of animal glue.

In my process experiment, wetting the raised layer and applying localized foil worked for small areas but made for a fragile bond. Applying a thin layer of rabbit skin glue and then applying the foil proved to provide better bond to the lower layer resulting in less tearing as subsequent layers were added.

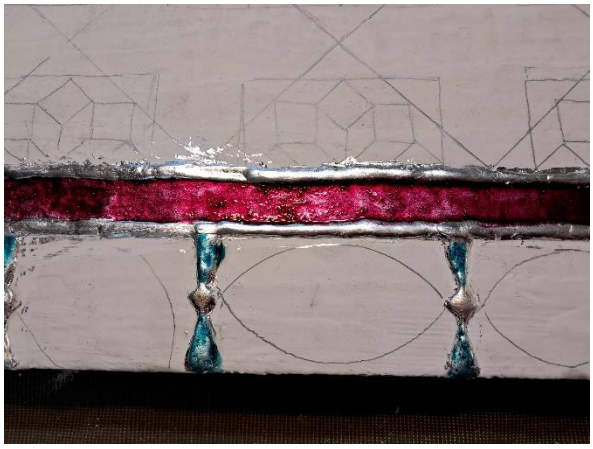
Figure 17 Foil added over entire test board

Once applied to the surface, the leaf and foil were carefully cleaned and in the case of the foil showing either as the final layer or under glaze a light burnishing was done to ensure a smooth even surface and prepare the piece for the next layer. For those designs which were left as the final layer or would only have a clear glaze over outlines were added to outline the shapes and when needed correct the shape providing a better overall visual effect. Thes outlines could be in a variety of colors depending upon the overall design preference.

Colored glazes

Colored glazes could either be applied directly over a metal layer, or over the paint layer to provide more depth of color or adjust the tone of the paint. For the sake of this paper, I will cover only once as the process is fundamentally the same.

Colored glazes applied over metal leaf and foil provided a contrast against the flatter egg-based paint as well as adding depth to the designs of the rooms. For the Tin leaf and foil yellow aloe glaze, or glazes with cochineal/verdigris were the most often employed. The copper, gold, and silver leaf were often left unglazed or painted.



The glaze is a thin mixture, providing liquid to move the pigment and then when hardened, it creates a medium for it to stay. The glaze mixture with the colorants were brushed over the metal in thin layers, where thicker sections were desired multiple thin layers were added. These glaze sections when dried would have a glass like appearance providing a richness and a reflective quality.

Painting

Once the colored glazes had dried the rest of the areas and designs could now be painted. The unglazed areas were treated like a canvas displaying flowers, nature scenes, cityscapes, and even people drawn in the flatter areas, while the raised areas not covered in metal foil were incorporated into the design. The larger background colors and designs were first painted and shaded, then outlined, then fine details such as flowers and flowing vines were added to fill in the space (like white work in scribal design).

For most of the pigments in this process the binders I used followed those in Appendix C as my experiments followed what was indicated in those finds. These binders are combination of egg white, egg yolk, or whole egg binders from Magistra Pompeia Rufina Magnifica's chickens. For smalt egg white was used to ensure it retained its bright qualities which were lost in the yoke.

Due to the limited variety of pigment colors, the base pigments were combined to form other colors (such as indigo and ochre to form green) and to adjust the warmth of the tones. Pigments in their binders were also diluted with water to provide a pale effect. Glaze colors could then be added over the top of the painting in the final layer to adjust the warmth or coolness of the colors as described in the previous section.

Even with this smaller pallet of colors a rich variety of colors and tones is achievable as evident in extant pieces.

Conclusion

The process of creating an Ajami panel, and even the landscape and seasons as the rooms were often designed to highlight different areas depending upon the time of day. These walls are true work of art on a scale I did not truly appreciate until I took on this process.

The designs were specially designed to reflect the character of the owner and allowed the viewer to feel as if they were inside of a painting.

Despite evidence that these rooms were at one more time prevalent in the Middle East and especially Syria many have been lost due to changes in design preferences, poor aging due to varnish and cleaning practices, earthquakes due to the geography of the region, and political conflicts.

The amount of research on this topic was surprisingly sparse, considering the once prevalent existence of these rooms and the Syria Cultural Heritage is actively working to keep this art alive through grants, and teaching opportunities. Ultimately, it is the interest in these techniques and sharing of this knowledge which will keep this art form alive. This is where I believe that members of historic recreation organizations play an important role. Pulling together sources, learning dying trades and techniques, sharing knowledge with others as far as possible to breathe life into Ajami and other such art forms.

Revisiting this art form eight years later with several classes from skilled SCA artisans has provided me a much better understanding of the various pieces in this process and a basis for historic practices used during that time. Creating this process from a more historical perspective has yielded better results than I had hoped, and I feel confident I have met my goal on showing progression on my journey.

Appendix A

Cochineal is insect species Dactylopius Coccus where the the dye is extracted from females with unhateched eggs. These insects were used by the native peoples of Mexico, central and south americas as far back as the second century B.C.E. (Rosenkranz). It was first introduced to the Europe in the 1500s by the Spanish.

Cochineal is also soluble, meaning that it does not dissolve directly with a medium and instead needs to be mixed with a insoluble inert substrate. This is traditionally done with alumina. The characteristics though such as the brightness of the red for cochineal can be adjusted dependent on the substrate (tartar in this case).

The recipe used to create my cochineal was based upon the Paduan Manuscript from Venice in the late 16th – 17th century.

> Another sort of fine lake. Take 12 grains of powdered cochineal or fine grana, add to it 2oz of ley; leave the infusion for about 2 hours; strain it through a linen cloth and put it over hot cinders; When it boils add to it pulverized roche alum of the size of 2 peas then the ley will make a thick red scum; as soon as this happens throw it all onto a stretched linen cloth, when the clear ley will pass through leaving the coagulum on the cloth, which coagulum must afterwards be dried and made into tablets. (Merrifield)

I placed the cochineal in a tea bag for straining, then boiled it over the stove and steeped it for several hours.

I then added soda ash and alum to the recipe to adjust the PH .

I then filtered through a coffee filter to catch the “coagulum.”

The coagulum was then left to dry.

Once fully dried I then ground it to use for pigment.

Appendix B

For the creation of verdigris I followed the directions described by Pliny the Elder.

> Verdigris[1] is also applied to many purposes, and is prepared in numerous ways. Sometimes it is detached already formed, from the mineral from which copper is smelted: and sometimes it is made by piercing holes in white copper, and suspending it over strong vinegar in casks, which are closed with covers; it being much superior if scales of copper are used for the purpose. (P. t. Elder)

White vinegar was heated and placed in a glass jar which copper sheets of a medium thickness were then hung over and the lid to the jar closed. I used a pickle jar as this vessel is created to withstand vinegar fumes for long periods of time.

The copper plates were removed at two-week intervals and the verdigris scraped off the plates and then the plates were placed back into the vessel to continue to oxidize. Through this repeated process verdigris was thus harvested and for use in this project.

Figure 18 Copper plates suspended over white vinegar

Figure 19 Copper plates with Verdigris being scraped

Appendix C

Table 1 Summary of analytical results

	Pigment/colorant	*Binder*	*Methods*	*Comments*
PAINT				
Red 1	Red lead, often in combination with few vermilion particles	Egg (whole)	Raman, FTIR, GC-MS, Py-GC-MS, ELISA	ELISA indicated ovalbumin. The oil : protein ratio suggests whole egg
Red 2	Vermilion	Oil–protein	Raman, ATR-FTIR	Most likely egg medium. Found in conjunction with red lead underlayer
Pink	Organic red lake (probable cochineal)/lead white	Egg	Raman, SERRS, FTIR, ELISA	FTIR indicated oil and protein
Violet	Organic red lake/smalt	Oil–protein	Raman, SERRS, FTIR	SERRS yielded a poor spectrum for the organic red
Blue 1	Smalt (potash-based glass)	Egg (whole or white)	Raman, FTIR, GC-MS, Py-GC-MS, ELISA, SEM-EDX	ELISA indicated ovalbumin. SEM-EDX suggested 1–2% cobalt content; barium, arsenic, and aluminum are also present. GC-MS and Py-GC-MS show non-drying oil. The oil : protein ratio lies between that of egg white and whole egg
Blue 2	Indigo/lead white	Oil–protein	Raman, FTIR, PLM	—
Green 1	Basic verdigris/lead white	Egg (whole or yolk)	Raman, FTIR, GC-MS, Py-GC-MS, ELISA	ELISA indicated ovalbumin. The oil : protein ratio lies between that of egg yolk and whole egg
Green 2	Orpiment/indigo	Oil–protein	Raman, FTIR, PLM	—
Yellow	Orpiment	Egg	FTIR, Py-GC-MS, ELISA	ELISA indicated ovalbumin. GC-MS methods showed non-drying oil and small amount of *Pinaceae* resin. Probable contamination from the oil-resin varnish
Orange	Orpiment/vermilion	—	Raman	—
Black	Carbon black	Protein–gum	FTIR, Py-GC-MS, GC-MS	Source of protein and gum not identified
White 1	Lead white	Oil–protein	FTIR, ATR-FTIR, Raman	—
White 2	Gypsum ($CaSO_4 \cdot 2H_20$)	—	Raman	Exposed ground layer used as white background
GLAZES				
Green	Verdigris	Drying oil–*Pinaceae* resin	FTIR, Py-GC-MS	Probable linseed oil, based on the palmitic to stearic acid ratio
Red	Cochineal (probable), no inorganic substrate	Drying oil–*Pinaceae* resin	Raman, SERRS, FTIR, ATR-FTIR, Py-GC-MS, SEM-EDX	Sample likely contaminated from upper varnishes
Orange	Aloe (probable)	Drying oil–*Pinaceae* resin	FTIR, Py-GC-MS, GC-MS, HPLC	Probable linseed oil, based on the palmitic to stearic acid ratio. Specific markers for aloe were not detected by HPLC
Yellow	Undetermined	Drying oil–*Pinaceae* resin	FTIR, Py-GC-MS HPLC	Sample likely contaminated from upper varnishes
PREPARATION LAYERS				
Wood size	—	Collagen glue	FTIR, ELISA	ELISA indicated collagen
Ground and *'ajami*	Gypsum	Collagen glue	FTIR, ELISA	ELISA indicated collagen
METAL LEAF				
	Composition		**Methods**	**Comments**
Tin	Tin, cassiterite (SnO_2) and romarchite (SnO)		SEM-EDX, micro-XRD	Romarchite and cassiterite are corrosion products
Gold	95.5% gold, 4% silver and 0.5% copper		SEM-EDX	—

(Mechthild Baumeister)

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