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The Production of Miniature Painting

by Alanna M. Benham

**Painting Ateliers**

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PAINTING ATELIERS

Muslims associate all texts with the ability to communicate divine knowledge. Since Muhammad set down the teachings of the Lord with the humble materials of a scribe, the very act of writing has assumed spiritual significance. Miniature paintings come from a cultural tradition which attributes the highest respect to the literary arts. Master calligraphers and painters were viewed as valuable cultural currency by the Persian courts. In prosperous times they had the agency to conduct their ateliers as they wished, however, in times of political upheaval, artists were frequently relocated to please the intervening power. The copyist Mir 'Ali was forcibly taken from Herat to Bukhara by a hostile army in 1528. He laments his fate, "Alas! Mastery of calligraphy has become a chain on the feet of this demented one."

Painters learned their craft as apprentices in an atelier system. Generally these ateliers were farnily operations. Fathers taught their art to their sons who guarded their skills as a well-kept family secret. New admissions to painting ateliers, particularly in Persian schools, were very rare. However, by Mughal times the establishment of Persian-style painting schools on unfamiliar soil encouraged the relaxation of these norms to permit talented Hindu artists to join painting ateliers.

A significant portion of a student's training came from copying recognized master compositions under the eye of the atelier's master. Students copied outlines to gain proficiency with a brush and ink. The method of pouncing was most frequently employed for copying compositions. A student would be given a master drawing, a piece of thin, transparent vellum and a piece of paper to execute a pouncing. The student would then use a very fine needle to pierce the vellum along the major outlines of the original composition. The vellum would then be secured to a piece of paper which was affixed to a wooden board. The student would then use a small pouch of charcoal dust to powder the vellum surface with a fine layer of charcoal. The charcoal dust would penetrate the holes pricked along the selected outlines. Because the charcoal powder contained no binding medium, it could be easily brushed from the vellum surface or the paper surface. The student would then remove the vellum original and use a light red-ochre pigment to fill in the lines suggested by the pouncing process. Finally, the master would inspect the work and correct any errors with perrnanent black or red ochre ink. These vellum sheets would be retained by painters as prized records of successful compositions.

MATERIALS USED IN MINIATURE PAINTING: PAPER, PIGMENTS, MEDIA

The physical materials from which miniature paintings were influenced their manner of production as well as their state of preservation in the centuries since their creation. Painting materials were valuable trade goods throughout the region. Artists had intimate knowledge of the intricate processes required to produce the best materials.

Paper

Local preference for particular writing grounds often led artists to procure paper from distant cities at great expense. Different types of paper were found in Persia from those found in India.

Paper was introduced to the Arab world by the Chinese in the eighth century CE, approximately one century after the advent of Islam. Previously, texts were written on vellum, a type of sized animal skin which was prepared to receive calligraphy and limited painted decoration. Early Arabic texts are written this way, particularly the Qur'an. However, in 751 CE, after the Battle of Kangli in western Turkestan, a group of Chinese prisoners held in a military camp taught their captors their skill of paper making. The first state paper manufactory was established in 794 in Baghdad during reign of Harun al-Rashid. Paper quickly replaced papyrus and parchment for common use, though it did not replace vellum for general use until approximately the tenth century CE. By the 10th and 11th centuries paper manufacture was spread over whole Islamic world, through Turkey, Egypt, and Persia. As paper became a more common writing ground, Muslims found that it could receive a greater amount of painted decoration and illumination than traditional vellum. The technological innovation of paper brought new illustrative possibilities to Arab calligraphers and made possible the development of miniature painting and manuscript illumination. Paper also had the advantage of being versatile to produce; it could be made in large sheets and trimmed down for smaller leaves. Paper was manufactured in a range of different sizes, from 73 x 109 cm to 6 x 9 cm. This made a host of new options available to artists, calligraphers, and literary patrons.

Paper manufacture became something of a regional specialty by the sixteenth century. All types of paper favored by Persian artists were exceptionally thin and delicate. Often, several sheets would be pasted together to form a firm ground for painting upon. At least ten kinds of paper were recognized as quality stock and were frequently used in Persia by this time. These included:

Daulatabadi – made at Daulataba in the northwest territories of the Nizam.

Khata'i – from Khatay, North China

'Adilshahi – from Adilshah

Hariri – silk paper from Samarkand

Sultani – from Samarkand

Hindi – from India

Nizamshahi – from Nizamshah

Qasimbegi – from Qasim Beg

Hariri – silk paper from India, which has cracked in the course of time.

Gauni – colored paper from Tabriz. Said to be the color of moist sugar, a faint yellow.

Paper from Damascus and Abyssinia was regarded as inferior in quality to that of Samarqand and Baghdad. The Safavid courts specified that no paper should be employed in their texts which was inferior to that of Samarqand. Emperor Babar, the founder of the Mughal dynasty, even stated in his memoirs that the finest paper in the world came from Samarkand. Paper manufacture persisted in Baghdad and Samarkand until early in the twentieth century.

Many craftsmen were required to prepare the paper surface to receive calligraphy, illumination, or painting. Apprentices would often be put to work smoothing leaves of paper for a master painter or for more advanced apprentices in their atelier. A smooth surface was essential for the flowing line of Persian calligraphy or the exacting detail of miniature painting. This was achieved by placing a leaf on a plank of smoothed chestnut wood with an even grain. The paper was then rubbed with a crystal or agate egg-shaped burnishing stone weighing approximately half-a-pound. After repeated burnishing, the paper surface became as shiny as glass, and also less porous to the pigments used in painting. This gave the painter increased control over the painting process by reducing the tendency for pigments to run or bleed across the paper surface. Some calligraphers and artists sized their paper with a thin coating of egg white or light soap to make it more receptive to fluid line. Iranian paper makers generally used egg white as sizing, while their Indian counterparts preferred a starch solution of rice-water.

Paper was not introduced to India until considerably later, likely in the late 14th century. Previously, Indian Buddhists, for whom written texts were essential components of their religion, wrote calligraphy on palm leaf strips and bound them into books. Indians generally tolerated a more coarse paper surface than their Persian counterparts.

Three kinds of paper were commonly used in India:

Bansaha – made from crushed bamboo

Tatha – from jute

Tulat – from cotton

Cotton was always bleached before being used to make paper. Rag, linen, or sillc refuse from textile weaving were also materials from which paper was often made.

Pigments

A broad palette of pigments is represented by the painted miniatures in the Minassian Collection. Mineral pigments, organic inks and dyes, and earth tone pigments are all important components of the miniature painter's palette. To maximize the versatility of the available materials, painters frequently mixed their pure colors to obtain a range of secondary and tertiary colors. To these colored pigments was added the gleam of metallic gold and silver leaf, commonly used in Persian, Mughal, and later Indian miniatures.

All pigments had to be prepared before they were suitable for use in painting. Pigments had to be finely ground, generally with a mortar and pestle, to achieve the greatest possible depth of color and vibrancy. Secondly, pigments had to be filtered with a series of washes to remove impurities which decrease the pigment's brilliance. Third, the pigment had to be mixed with a binding medium. Binding medium serves three important purposes: it increases the fluidity of the paint mixture, allowing it to be more easily spread on the surface of the paper. Binders also make the pigments increasingly water soluble. Finally, binders constitute the medium which physically holds the paint to the paper surface after the water in the paint mixture has evaporated. These steps were universal among painters for whom details of material availability, training, and cultural traditions may have been very different. As such, the constraints of the medium may be treated generally. However, some regional differences exist in terms of local preferences for particular types of binding media over others. These will be addressed in the sections describing each pigment.

Black: Black was one of the most important colors for all miniature painters. It was used to prepare sketches and underdrawings for finished leaves and to provide a depth of tone within paintings themselves. Black was most often obtained from a source of pure carbon, often by burning organic material such as bone, oil, or wood and collecting the soot that was produced in combustion. This soot was then ground. For use as a paint, a water-soluble binder was added to the soot. Charcoal was produced in sticks suitable for sketching by burning twigs, which yielded convenient writing implements. Charcoal powder was also used to transfer compositions via pouncing, a process described elsewhere. Black has the advantage of being universally available, inexpensive, and highly permanent.

White: Persian and Mughal artists used lead-white, zinc-white and chalk to produce white pigrnents.46 White was used to prime the paper surface prior to the addition of color. It was also used as a pigment, accenting particular details of a composition. White was often mixed with other pigments to obtain pastel shades, particularly blues and purples.

Red: Red was regarded as a color of festivity and celebration. A great variety of red pigments were available to the Persian painter. One of the most important of these was red ochre, obtained from iron oxide. Red ochre was not scarce or expensive compared to other red pigments. It was frequently used in preparing the preliminary sketch for a miniature painting. Other more brilliant reds were made from vermilion or mercury sulfide.

Green: A large number of green pigments were available to the Persian painter. Though landscapes were often not depicted in true-to-life colors, green had considerable importance as an accent color. By far the most destructive pigment in the palette is verdigris green. This pigment was made by mixing copper filings with vinegar. The resulting pigment is a brilliant copper-patina color. However, for all its visual appeal, verdigris is highly caustic to the paper surface. In isolated areas of damage, the pigment often flakes off, leaving a brown stain that often soaks through the paper to the reverse side. In more serious cases the pigment will burn a hole through the paper by making it so brittle that the paper itself simply flakes away. Verdigris decay is exacerbated by stressful conditions, particularly by excess moisture. Many paintings in the Minassian Collection suffer from areas of verdigris damage which must be corrected to ensure satisfactory preservation.

Some non-caustic green tones could be made by mixing stable yellow and blue pigments. This seems to have been far more common for Indian painters than their Persian counterparts.

Blue: Blue pigments were obtained either from mineral or organic sources: Mineral blue, or lapis lazuli, the same blue pigment which was in great demand by renaissance and medieval European painters, was also prized in Persia for its lustrous brilliance. It was costly compared to other altematives, and is generally restricted to relatively small areas of miniature paintings. However, mineral blue was frequently used in illumination, often in sumptuous pattems of metallic gold, with subtle accents in orange or red. Organic blue was actually a form of indigo blue dye. These blue pigments were often mixed with white to obtain pastel shades of blue, which was particularly useful in illustrating intricate interior scenes of painted tile.

Orange: The vibrant orange hues seen in Persian paintings are the result of mixtures of red and yellow. Orpiment was the most common yellow pigment used for making vibrant orange. This bright yellow was mixed with a suitably bright red to obtain the purest possible orange.

Yellow: Yellow was used infrequently by Persian painters, though often as an accent color. Orpiment, an arsenic derivative, was the most common bright yellow. Yellow ochre, obtained by filtering a particular type of soil, was also frequently used in painting throughout the Islamic world.

Mauve or lavender: The range of mauve and lavender tones seen in miniature paintings are secondary color mixtures of a red, blue, and white. Some vibrant purple tones are occasionally encountered, which consist only of red and blue. Vermilion and indigo mixtures produced a particularly successful purple tone.

Metallic gold and silver leaf: Gold leaf was an extremely versatile media in the Persian palette. Gold leaf was used frequently in text illumination, in paintings, and in decoration for the borders of manuscript leaves. Details of armor, architecture, metallic vessels, the flaming nimbus surrounding the head of a divine figure, even landscape or celestial elements were frequently treated in gold. Silver leaf was frequently used to depict water, though it was also used for armor, architectural detail, and personal articles. Unfortunately, the silver leaf used in all miniature paintings has oxidized over time to a dark black color. This oxidation is impossible to remove because the silver layer itself is extremely thin and fragile.

Metal leaf was prepared for use in manuscript illumination by interleaving small pieces of the desired metal with sheets of supple deerskin. These piles would be wired together to form a bundle which was repeatedly pounded with a wooden mallet. The gold would then be mixed either with gum arabic or glue to form a paste, which was then filtered with a clear water wash. The sediment which fell to the bottom was the most pure gold. This was collected and mixed with saffron and dry glue to create gold paint.

[Leaf with border of gold-flecked, toned paper]

The addition of metal leaf was generally the work of specialists associated with the ateliers of illuminators and miniature artists. Metal leaf was adhered to the paper surface using any of a number of sizing media. Rice water was a common solution, as it did not remain tacky after the water had evaporated. Gum arabic, animal glue, or starch paste was also used for this purpose. Several of the leaves in the Minassian collection contain borders of gold-flecked, toned paper. Two methods were used to obtain this result. Artisans could prepare the paper surface with the desired sizing medium, then use a cloth pouch containing flakes of gold leaf to pounce the substance onto the paper surface. A similar result could be obtained by preparing a paint made of finely powdered gold. A brush would be saturated with this paint, then used to splatter the paint across the paper surface. After being applied to the paper surface in the desired manner, the artist would burnish the gold surface with a fine brush.

Media

Persian painters used both animal and plant sources for binders. Animal glue was frequently used for its excellent viscosity and permanence. Artisans prepared animal glue by boiling a hide, often buffalo hide, in water. After shredding the hide into bits, these fragments were boiled in water to extract their proteins. Once the mixture had obtained a buttery texture, it was cooled and rolled into balls. These glue balls could be stored for long periods of time. Painters simply dissolved them in hot water when they needed more medium.

Gum arabic was the most common vegetale binder used by Persian and Indian artists alike. Artists have used this material for centuries for its excellent hydrophilic properties and viscosity when mixed with pigment. Even today, gum arabic is one of the most widely used binding media for watercolor and gouache paint. Persian painters had a fine grade and a more coarse grade available to them. The finer variety was available in crystalline form and was used for mixing with pigments. Coarse gum arabic would be mixed with more coarse pigments used for priming the paper surface.

WRITING IMPLEMENTS: BRUSHES AND PENS

Pens made of carved reeds were the preferred writing instruments of many Persian calligraphers and painters. The reed pen, or qalam, was a versatile writing tool which required tremendous sensitivity to carve correctly. Painters and calligraphers owned special sharp knives which they used for the sole purpose of carving reed pens. The nib was carved according to the use for which the pen was intended. Because different styles of calligraphy had strict rules conceming the relative proportion of line thickness to letter-size, each style required a pen of a specific shape. The famous calligrapher Sultan 'Ali suggested that scribes use a new pen to execute a series of dots. If the pen could form regularly-shaped dots without splattering the ink, it could be used to execute all the letters of the alphabet with precision.

Paint brushes were among painters' most prized possessions. Miniature painting is known for its precision and highly articulated detail. Such finesse requires a versatile and responsive brush, coupled with intense training in the properties of different types of brush. Brushes were made in varying thicknesses. The painter would have been very conscious of selecting the proper tool to achieve the effect he desired. Miniature painters generally used each brush for only one pigment so as to avoid contamination by pigments which would diminish the brilliance of the finished painting.

The material used to make paint brushes was procured according to available materials and local preference. Mughal artists favored brushes made from the downy fur of a common type of squirrel. Persian artists favored brushes made from the hair of a white cat which was specially bred for supplying hair for brushes. Other substances used for more coarse brushes included the hair from a goat's inner ear, fibers from certain plants, etc. These fibers were gathered together inside a quill from a pigeon's feather. This quill was trimmed and affixed to a handle of the artist's choice.

CONSERVATION REQUIREMENTS

The majority of the pigments seem to be in sound condition. A large portion of the palette is comprised of earth tones such as burnt sienna brown, yellow ochre, red ochre, and burnt umber. These remain largely stable and permanent. Red tones, derived from a variety of different sources, remain extremely vibrant and stable on the paper surface throughout the collection. A brilliant orange is seen consistently through pieces in the collection, which remains extraordinarily vibrant and stable. Black and white tones are also consistently well preserved. Tones of light and dark blue are found throughout the collection, representing a number of different pigments. The majority of these also appear to be quite stable. Lavender or purple tones are frequently seen in the Persian paintings, and to a lesser degree, in the Mughal paintings. This pigment, too, remains well preserved. Yellow tones are rarely seen in the Persian images, though they are very common in the Indian paintings. The yellow tones display consistent high quality and excellent preservation.

The most pressing need for conservation within the collection seems to be the frequent occurrence of verdigris pigment which is highly destructive to the paper surface. The only set of colors which pose a substantial conservation dilemma are tones of green. Verdigris green was frequently used in the Persian material and has resulted in paper damage for a large portion of the material. Pigment cracking and flaking is a persistent problem where this pigment is found. Some specimens have compromised paper surfaces and extensive browning due to the caustic properties of the pigment. Other types of green pigrnent display fewer conservation requirements, though many Persian greens appear to have faded somewhat from their original values. In contrast, many of the greens used by Indian painters remain vibrant and relatively stable, indicating a difference in pigment material. Of course I have generalized the condition of these pigments by grouping them by color; truthfully, some problems occur sporadically throughout the miniature collection with some examples of damage to be found for each color. Cracked and flaking pigment is a persistent problem throughout the collection. This ought to be addressed by an astute conservator who is familiar with traditional Persian and Indian pigment materials. However, the great majority of the collection remains wonderfully well preserved considering the age of the materials and the great use to which they were subjected when bound in their original albums.

Piece showing signs of repair

The relatively recent addition of adhesive stickers or cellophane tape has stained the paper surface of many leaves to which it has been applied, posing, in my opinion, the second most pressing issue requiring conservation treatment. A great many of these leaves have cellophane tape around their perimeter. The adhesive from this tape has degraded, leaving yellowish-brown stains on the original paper. Adhesive stickers bearing collection numbers used by dealers to number or organize these leaves are found on the verso side of many of these leaves as well. Two designs reoccur frequently; one is a circular star design in red or green color, the other is a rectangular white sticker with bands of red printed around the border. In areas where the paper upon which they were placed is thin or fragile, the adblesive from these stickers can penetrate the paper and leave a brown imprint on the other side of the leaf. These stickers have lost their internal relevance as numbering system for the items to which they refer, and they ought to be removed as soon as possible.

At the time of my survey, no recent conservation treatment had been given to the leaves, other than the preventative treatment of placing them in a stable, climate-controlled, acid-free environment. Many of the pieces show evidence of subtle repair, likely by native artisans or by someone skilled in the delicate techniques of paper inlay according to traditional Persian and/or Ottoman technique. A few of the pieces show possible evidence of later retouching, though a more comprehensive analysis of pigments would be necessary to support this observation. In general, the collection is in excellent condition. Virtually all of the pieces which contain text remain legible, and only a very few of the painted images have been so damaged as to impair the interpretation of their subject matter. As of the publication date, conservation treatment has not yet been scheduled, though it is recognized as a need by the library.

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