CHAPTER- 5.

Realization of artistic method, outward structure, used technique, method and materials in both places
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Aesthetically Characteristics of 40 Columns Wall-painting

It is essential to study the aesthetics characteristics of Iranian painting in brief before starting discussion on the painting aesthetics of the 40 columns.

The Aesthetic Characteristics of Iranian Painting:

While talking about Iranian painting, the term “Miniature” is used, but it should be kept in mind that the Iranians have been working on different fields of decorative and pictorial art since a long time ago. For example, wall-painting mixed with Colour plaster moulding became convenient since the Arsacides era and continued till recent times.

“During the early times fresco was given utmost importance among different types of visual art, while after the coming of the Mongols to Iran, its importance too declined in comparison to pictorial books. Large size painting was again considered during the Safavid period. However, it was precisely dependent on small size image features”.

1. Contemplative features of Iranian miniature:

“The Iranian miniaturist himself was Sufi or he was fully familiar with the Persian poetry and literature and the ancient wisdom of Iran and Islamic Sufism. Moreover, like the mystics he considered hierarchy for existence (Islamic mystics have always believed in three universes: Rational universe, Tangible universe and Example universe; the Rational universe is the spirit place; the Tangible universe is the place of matter, and the Example universe placed between these two universes, has no material reality). According to this school of thought, an Iranian miniaturist was never seeking to represent nature but was trying to picture the origin and essence of natural images”.

The Iranian artist was more interested in picturing his own aspirations through an imaginary world. And if he looked around the world, he did not think of imitating three-dimensional space of light and shadow and Colour and shape of objects. He could show everything with the help of the simplest lines and purest Colours. However, the pure aesthetic approach existing in the Iranian painting never detained the Iranian
painter from paying attention to human values and mankind. Heroes and various events in Iranian painting, which have come from the collective depth of memory, are all a part of his painting subjects.

Thus, no certain time and place, nor the physical laws of material world could be seen in his painting. Mountains, man, bird and tree and etc in his pictures are more archetypes that have come from deep inside him and not the stereotyped forms of nature. This is a world beyond time and space, where its elements have been created according to a general and eternal pattern. In fact, they state the conceptual approach through signs. And never display the objects with the main characteristics, which attribute to their external aspects or living. The stories that they painted were rooted in mythology and ancient history, events appearing in a world of fantasy and legends. In other words, the memory of ethnic, spiritual ideals and the live cultural spirit existing in poetry of the great Iranian poets such as Ferdowsi, Nezami, Saadi, Hafez and Jami is expressed in the form of Colour and manuscript language in the Iranian pictures of the painter. In fact, only the substance and content of the story is considered so that imaginary forms that existed in the Persian Poetry were also consistent on Iranian painting (for example, the poet likened the night to azure, the day to topaz, face to the moon, the height to Cypress, lips to the flower bud, etc. and he was trying to find the metaphorical equivalent of this visual language and to applied it). And they gradually collected a list of contractual funds role based on the theme of epic literature and were using it with brief changes through the years. (PL209, PL209A)

**Structural features of Iranian painting:**

The artistic method of the Iranian painters was based on unrealistic orientation. The Iranian painters achieved a certain aesthetic system having its own characteristic discipline and rules based on the pictorial traditions before Islam and derived from (influenced by) Chinese painting. The most important principle in this system is the principle of spiritual space building, which was formed based on the embodiment of the Example universe. In each section of his paintings there was a special event and was often independent. This space is not perspective-based or a point space, but it is a structure made up of continuous or non-continuous plans extended from the bottom to the top and then spread around. In other words, it is a set of plans that, at the same time, have been seen from above and vice versa. However, this two-dimensional space is not
quite simple, sometimes it looks somewhat deep and three-dimensional, and nor like Chinese painting having vacant space, and not even as European painting, having insists and focal points. A light, without shadow, along with a range of bright Colours is one of its main features. Painters also made the picture structure using Colour and line with the help of geometric methods, rules of composition and circular helix. The decorative features and expressive Colours were used in the best manner. Coloured flat surfaces with complete coordination were arranged together and each Colour showed itself in its best form. The Iranian artist often used golden, silver, cobalt blue, and shaded-gray Colours on large surfaces and brilliant and strong Colours on smaller surfaces. (PL2010, PL2010A) In addition to fixing coordinated Colour, the Colour rhythm would also get a lot of importance. Hot and cold, pure and broken, dark and light Colours were displayed as a harmonious network. Another important principle in the aesthetic system of the Iranian painting is the principle of internal communication of image and text in which line is considered the main factor of this link. Line shapes the manuscript, makes the figures, and separates the Coloured surfaces from one another. Therefore, manuscript and image appears as a harmonious and coherent network of lines. (PL211, PL211A)

**Functional features:**

Iranian miniatures have been considered as a kind of painting, but it is different from other painting of the world because of insight, content and structure features, and also considering the cultural, artistic activity and personal characteristics of its Orders.

“Iranian miniaturists were mainly sponsored by kings and princes and their art was not accessible to everyone. They worked along with other artists on painting and book layout in courtier workshops. In addition, they followed traditions under the influence of cultural environment and learned the art system of that time. The result of this type of art husbandry caused conditional growth of art according to the prevalent political situation, and had a direct effect on the Order taste in artistic productions and saw the emergence of formal and contract styles.”

The artist, therefore, tried to mix his visual creativeness with symmetry and total obsessive finishing. (PL212) Although his field of activity was not very wide and independent, he could display his imagination and skilful power within this limitation. Thus, the Iranian miniaturist achieved a sumptuous artistically nature. Therefore,
styilization, symbolization, and decoration were common in the visual art of this land since the earliest era. Moreover, aesthetic principles of Iranian miniatures were formed and evolved based on these abstract perceptions” 12. (PL213)

**Technical Characteristics**

In Iranian miniature, art was associated with some kind of industry. As a result, this industry was associated with many problems. Painters were often trained from childhood through adolescence under the Master apprenticeship and were taught the work principles by systematic and successive exercises. They were initially trained in such a way that they were able to recognize the tools and materials early in life and use them well. The preliminaries required to enter the field of painting were learning how to make a narrow brush, scuffing tiny paintings, gold beating, azurite laundering, glazing of paper, delineation, painting with physical Colours, and finishing. Recognition of quality of the materials and knowledge of work nuances made him a skilful artisan. In addition, a lifetime practice and his work led to the rise of a kind of perfection in his artwork.

**Aesthetic features of ChehelSotun palace wall painting:**

For to study the aesthetic feature of Chehel sotun palace wall painting, look up two aspect is necessary:

“First approach: Believes, credits, the universalisms, and intellectual spaces in the era of Shah Abbas. Since that time, aesthetic expression appeared based on the wisdom, philosophy and divine teachings of that period. This of course does not mean that philosophical universalism existed first and then the arts were formed based on them, but the conditions ruling at that time resulted in crystallization of wisdom and philosophy… in all fields. These thoughts and ideas and philosophical spaces appeared in some place in accordance of the language, of wisdom and philosophy in other place in accordance to the art language (painting, architecture, urbanism, and crafts, etc.). This method of aesthetic expression could reform the ideal space of that period to a certain and specific language; that ideal space was formed based on imagination, discipline, composition, form, Colour, and creativity. Iranian painting is typical in this regard” 13.

‘The Iranian painter by painting on a two-dimensional surface, created a picture indicative of the presence and awareness of a world above our physical world, a time
and place beyond the material time and space, and a Colour and shape beyond the material Colour and shape. Seyed Hussein Nasr 14 in this regard, states: “a world that an Iranian painter creates is the world in which events occur, but not in a material way. This is a world that the Islamic rulers have so called imaginary or Example, or the outstanding universe. Even the animals and plants in the painting scenes are not merely imitation of the natural world, but is an attempt to depict that heavenly nature, and its initial and natural creation. (PL214, PL214A, PL214B) In other words, it is the lofty paradise and the celestial world, which is seen in the imaginary and /or the Example world. Similarly, Colour of any mountain or cloud or sky is different from the natural one. In addition, this unity and unique realm refers to the universe.”15(PL215)

Of course, it should be noted that the concept of imagination is not a kind of learning, which has been innovated because of the thought, mysticism, and art space of that era, but the medieval fantasy world that has been considered by the rulers before the Safavid dynasty. The only difference here is that in the Esfahan school, thanks to the rulers of that era, the fantasy element with reference to Shiite thought gets a more recent understanding and expression. This new understanding of the concept of imaginary world is of the artists’ innovations that later philosophy describes and interprets 16. The imaginary world, therefore, is of the most fundamental pillars of Iranian paintings and the most important aesthetic feature of the Esfahan school, and is considered as its fresco and quite matches with it.

**Visual features (formal structure) of the Chehel sotun place works:**

As noted above, the Iranian painter needs a special language to express his imaginary world; this language and particular expression is manifested in the painting works of the Esfahan school. Feature of outward aesthetics’ wall paintings of this period depend upon the appearance of aesthetic space of the Esfahan school, including the following:

• The use of flat, bright and contrasting Colours and yet being harmonious; (PL216)

• Uniqueness in the Colour of everything and its difference compared to natural Colour, although it implies to nature ;( PL217)
• More attention to the dark lines for surrounding the Coloured surfaces ;( PL218 , PL218A)
• Removing perspective and inducing distance by planning forms and Colours cheme ;( PL219)
• Uniform light throughout the picture in such a way that all Colours are bright, transparence and a light source ;( PL220)
• Deleting volume processing, light and shadow painted in European style ;( PL220)
• The main attention to the composition of the human figure in different scenarios ;( PL217)
• Attention to expressed states of figures and presenting a very strong and powerful plan in detail as well as in total;
• Creating a poetic sense as the painting issues is real ;( PL221)
• Addressing the details of figures and painting elements clearly, and obviously (like hair, face processing, mountains, bushes, and designs on clothing). (PL222)
• Relationship between the paintings subject and the type of structure theme.17 (PL138)

Thus, based on the formal structure and the structure of the Esfahan school vision, it can be concluded:

1. Imaginary idea is the most fundamental and important tenet that exists in all artworks of this period.
2. The artist attempts to create a land and material world, but in such a way that is different from the earthly and material universe.
3. The abstract or non-abstract compositions are based on the existing available order that this arrangement has got its unity through various elements.
4. Use of complementary and contrasting Colours, bright and harmonious, to reach paradise and space.
5. Imagination and reality, to be or not to be is a very important feature of that period painting. For example, although the human figure is a sign of man, it is not clear who he is, i.e., then? Even is no specific identity to the personage in some of the miniatures diagnosing sex of male or female, is hardly possible because the corpus does not belong to pure spirits nor to the material world, but is in between the two worlds.

One of the features of the real murals is that it is an indivisible part of the building wall and therefore inevitably has to be dependent on factors and architectural spaces to establish full unity. Therefore, the Safavid-era murals have been generally on the main walls of the buildings and artists have always been working with the original materials simultaneously.

**Safavid Era Fresco Techniques:**

*In general, the following works of four techniques can be noted in the fresco the Safavid era:*

1. Tempera Technique (Physical transparent waterColour) or red supply layer
2. Tempera Technique without supply layer
3. Oil Colour Technique with red supply layer
4. Oil Colour Technique without red supply layer

**Tempera Technique:**

Tempera is an old technique in painting in which the dye is combined with egg yolks and then after combining with water is ready to be drawn on the board. In this method, Colours seem brighter after drying. Paintings drawn in this way are very stable.

**Oil Painting Technique:**

**Oil painting Fresco:**

Using of oil painting to create art works is an age-old practise. The ancient Greeks and Romans as well were aware of this method. Perhaps it can be said that this method has been less used in Iran, the Middle East and Asia. And the main reason might be climatic and weather conditions, which are important aspect. As most of the regions of Iran had dry weather conditions, watercolour technique was the most used technique and only during the Safavid period, the oil painting technique became conventional.
This technique was used for the construction of large wall panels. Of course, apart from the climate factor, we should point out that Iran’s expanded relations with Europe and neighbouring countries such as India and Russia during the Safavid dynasty, led to its becoming familiar with the oil painting style. Willy nilly, they used this new technique in creating their artworks. In addition, on the other hand, since the Safavid rulers, like West art, had a keen interest in construction in painting, the oil painting technique was responsive to demands and needs of these people.

**Administrative Method and Fresco Procedure:**

Fresco was generally done on the main base and anchor of the building mostly made of bricks. And generally, can be divided into three stages:

1. **Wall preparation:**

   The first step is wall priming rendering (scumbling) which is common in elaborate working parts of the buildings and was done according to the following steps:

   **Wetting:** at this stage, the wall was slightly wet to remove dust and make better wall rendering.

   **Looping or plaster** (hard and resistant gypsum) was used in order to make accurate wall plummet, making direct and smooth rendering layer.

   **Rendering layer:** Generally, rendering was made of soil and straw and was made like thatch. Sometimes, crushed gypsum and soil was used in the ratio of 2:1 unit respectively.

   **Cortex:** it includes the crushed soft gypsum with a diameter of 3 to 5 mm, and was mainly used over the rendering layer for bleaching the inside building wall. Cortex sometimes had several parts; its thickness was gradually lessened and was used with softer and smoother plaster.

2. **Paint grounding (priming):**

   “In general, grounding in painting including wall, paper, cloth, etc., has positive results. It leads to stability and durability of paint particles, delineation, and easy construction, Colour brightness, strength and durability of the rendering layer.
In grounding the frescos of the Safavid-era, tragacanth and sugar solution and dilute solution of Arabic gum with glue (animal glue) have been used for paint grounding and decorative works. In some cases, some amount of mineral Rose (red ochre) was added to each glue, which is named under the term “fresco with red supply layer” 20.

3. Plan Transferring on the Wall:

After determining painting space or range on the wall body, the painting was carried out on paper or cardboard having dimensions of 1 by 1. The masters made final approval after required Plan reviewing and after holing, the plan (Smbh) was transferred by coal powder onto the wall.

4. Delineation:

The plan was to delineate and fix by brush and ink for strength and durability after transferring. Usually a dark Colour was selected for delineation.

5. Layer arranging:

Arrange of layer or Chinese layer was done on those parts that needed gilding. The main layer arranging substance is a variety of rose, which was mixed with diluted plant glue (animal glue) after rubbing and preparing. Then, it was layered over as multiple layers on each other so that it would be prominently visible; this is referred to as “Chinese layer.” As a result, this approach made a suitable background for bonding gold, which caused light shadow and prevented fully flat and smooth surfaces.

6. Colouration:

“This stage is the stage of final construction and the last delineation. Colouration was made quite flat. Final construction includes portraying, cloth finishing, mountains, clouds, trees and space making. And delineation, i.e. making the round Coloured surfaces, was done finally by brush and darker colours” 21.

Colours and Binders on Wall Paintings:

“Iranian artists have created important masterpieces by their hard work in decorating the architectural spaces and the external and internal bodies of buildings. During the Islamic civilization, live and varied Colours got a level of coordination that
was never seen before in the history of Iranian painting. These Colours are abundant in nature” 22.

Artists and painter designers used these bright, clear and beautiful Colours in creating their artworks. Of course, it should be noted that the Iranians have used Colours for wall painting, since early times like the period of the Achaemenid23, the Parthian, and the Sassanid and…. (The Achaemenid palace’ wall paintings, which have been worked on with various Colours, and are similar to the prominent design, is an example of this type).

“Use of Colour in the form of abstraction decorative painting, pictorial painting (mural), and decorations with mirror along with plasterwork on Chehel sotun palace facades was to create splendor, fully in connection with the performance of the main building, i.e. palace. Of course, the use of large amounts of gold and silver has helped greatly to this functionality and features” 24.

Colour in Iranian wall decoration had plenty of energy and brightness and enjoyed considerable artistic and Colour values. Two aspects affected these features:

First, these Colours resulted from the abundant light of the eastern lands, including Iran.Second, religious beliefs and the artist’s beliefs in light and his degree in wisdom and Islamic Sufism.

Each one of the wall painting Colours of Chehel sotun House are as light sources; the light source in these painting is not like the painting light source of the West in which it creates a shadow relying on natural light source and radiation factors on the phenomena. Nevertheless, for an Iranian artist, Colours have natural, paradisiacal and bright origin. Therefore, in this space, everything is clear and pellucid and Colours themselves are bright and act as the light source. “Iran is a country with abundant and diverse natural resources and mines. Existence of such abundant minerals and resources met the needs of Iranian artists. Not only were artists using these dyes, by extraction and preparation, washing and rubbing and smoothing, sometimes the Colours were also exported to other countries” 25.

Often Colours used in Chehel sotun palace and the other buildings in Esfahan during the Safavid dynasty were stable and durable Colours, and rarely a pigment can be seen that has changed, or has experienced physical and chemical changes over time.
In these paintings two groups of Colours have been used, natural dyes (mineral and herbal) and artificial dyes. Colour layer in paintings, whether a wall painting or on fabric, wood, and paper, always includes two important matters: the first pigment, which can be mineral, organic, or synthetic. And the second, binders or intermediaries that can be water soluble, such as Arabic gum, both water soluble and oil soluble such as egg whites or oil soluble such as oils.

“Iranian painting masters, in addition to Colour composition, have had extensive skills and experience in the preparation and provision of different Colours and binders. They often have used such Colours and binders that are in very good condition after several centuries. Studying wall painting Colours of the Safavid era in local bodies shows that these masters were well aware of different Colouring and Colour making techniques and have acted to select the Colours and binders based on environmental factors.”

Colours used in the Chehel soutun palace Painting (Reza Abbasi School) are:

Mineral Colours:

White lead, with lead carbonate and alkali hydrate with the chemical formula of

\[2\text{PbCO}_3\text{Pb (OH)}_2\]

White flowers with a special type of calcium carbonate with the chemical formula of

\[\text{CaCO}_3\]

Ultramarine blue with the chemical formula of

\[\text{Na}_8\text{-10A}_1\text{6Si}_6\text{O}_2\text{4S}_2\text{-4}\]

Copper Blue or Azurite or alkali Copper carbonate with chemical formula of

\[2\text{CuCO}_3\text{Cu (OH)}_2\]

Blue glass fragment with chemical formula of

\[\text{KCO (Al)}\]

Copper green or verdigris (malachite) with the chemical formula of

\[\text{CuCO}_3\text{Cu (OH)}_2\]

Minium or lead salty oxide with chemical formula of
Cinnabar or mercury sulfide with chemical formula of
HgS

Another type of green with its components of copper and an organic acid radical, not yet fully identified (Russian Green).

Akhraha (yellow, brown, red, greenish yellow)

Orpiment (Orpiment yellow) or arsenic trisulphide with chemical formula of
As2S3

Silver sheet with chemical formula of
Ag

Gold sheet with chemical formula of
Au+Cu

Natural organic colours

Kermes ink (transparent red vermilion oriented) with the chemical formula of
C18H12O9

Azure Blue or Indigo, a dye with the chemical formula of
2C16H10N2O2

Physical and chemical properties and mixing of pigments with different binders in the Chehel soutun palace wall painting:

Mineral Colours:

1. Lead-White

   Lead carbonate or lead-white is a natural material called Sirosite, which exists in nature but has never been considered as a white pigment. This pigment was known from far periods and is of pigments that have been artificially produced. It is known as lead-white in Iran. In different parts of the Chehel soutun House paintings (Reza Abbasi School), this Colour has been used alone or combined with other Colours. Since this dye combines well with egg yolk as binder, the paint layers have been remained in good
conditions. In addition, wherever this Colour has been worked on in the building internal parts of the building, no chemical or physical change have been found.

In these paintings, lead-white in combination with ultramarine has been used for the construction of sky and clouds. This pigment, due to having lead, a heavy metal has a very good coverage.

2. Chalk

Chalk is a form of calcium carbonate, which can be found in Iran in its natural form. It has been used for whitening rooms, as well as in Safavid Wall painting as a supplying layer on the plaster substrate of the decorative paintings.

Natural chalk is a soft stone, grayish white in appearance and very interesting white Colour is obtained when it is combined with water. This Colour is obtained by the decaying of marine microorganisms. This pigment dose not combines very well with oil. However, it combines well with glue powder and has good coverage power as Tempera and waterColour, which allows it to be used as an inert substance, mixed with glue, for the preparation of canvas. This white dye was sometimes mixed with other pigments such as blue, yellow, brown, or other Colours and was used as flat dyes. This is a group of mud Colours that have been accessed by Iranians for using in fresco decorations.

3. Ultramarine Pigment

The main mines of this pigment are the mountains of Kashan, Natanz and Saqquez in Iran and Badakhshan in Afghanistan. This pigment after preparation and cleaning up in Iran was exported through Venice to Europe. The methods of preparing this pigment were different from country to country. This pigment has been worked based on the Tempera method in most of the historical building of the Safavid era because of its Colour properties and excellent covering strength. Lazuli pigment has been used in the murals of Safavid and early Qajar and its strength has been proven by tests carried out in Rome Repair School. Ultramarine combines very well with egg yolk and Arabic gum but does not mix with oil. This dye has been used in Chehel soutun wall painting for Colouring of heaven, dress and patterns on Chinese dishes (in painting) either in pure form or in combination with lead-white.
In the wall paintings in Chehel sotun palace and other buildings, where this pigment has been used, no changes have been observed. Only those parts of the paintings, which at different times have been repaired and many layers of Colour and varnish have been added to the Colour would have changed and blackened due to blackening oil and impure dyes on the main Colour. (PL223)

In addition, this Colour has had usage in most of the historical buildings because of its particular beauty, coverage strength and its composition with gold (azure background and gold designs on the Chinese-layer).

4. Azurite or blue: natural copper

Azurite is a natural pigment obtained from Azurite ore. Its mines are found in the second layers of copper ore in many parts of the world. This pigment is suitable for use in Tempera painting because it seems opaque in oil and the transparency existing in Tempera painting does not exist in oil. (PL224)

Azurite is the most important blue pigment in the wall painting of the East and has been used during different periods of Chinese empires. In addition, it was used in ancient Egypt. In Iran, it has also been used in the Safavid period paintings known as verdigris.

5. Malachite Green

Mountain Green or Patina Green

This pigment is one of the oldest known green pigments made by human, and in different areas of the world is found along with the secondary copper ore. For producing this pigment, mineral is carefully selected and sieved. It combines well with water-soluble binders and Tempera but does not combine well with oil.

“Malachite is also found in nature in the form of hard stone, especially in the mountains of Iran. This stone, on powdering, yield a high quality Colour and has been used from early times. However, it is not considered anymore nowadays due to difficulty in its powdering operations, low strength and its low resistance against light.

This rock has been frequently used in paintings of the Chehel sotun palace as green dye, and modes of appearance and texture of Colour indicate copper particles inside the dye. This Colour is known as patina green. (PL225)
6. Red Lead or Minium

In fact, this pigment is lead tetra oxide, which is obtained by smelting Lethiarg with lead-white at a temperature of 840 ° C for several hours. Minium pigment is reddish orange in Colour having good coverage power and is used in oil painting and Tempera technique. The Colour, on exposure to light or intense sunlight, becomes chocolate brown after a few centuries, and this change can be seen more in the Tempera technique.

“Red lead pigment has been frequently used in the pictorial painting of the Reza Abbasi School and is one of the indicator Colours of this school and Iranian miniatures. This Colour is an old age pigment and perhaps its existence equals the antiquity of lead metal itself. The pigment was gradually used in the middle Ages and came to be commonly known as Minium.”

7. Vermilion

Cinnabar vermilion is a natural mineral obtained from the main mineral of mercury metal. Vermilion has been used extensively on Roman wall painting, especially in the Pompeii, hence known as Pompeii red. This Colour has a certain brightness and clarity and cinnabars found in almost all countries of the world. This Colour has also produced artificially. The physical and chemical properties of natural and artificial vermilion are similar and cannot be distinguished from mere appearance.

Vermilion is one of the heaviest pigments and has excellent consistency and covering power. Of course, this pigment is not at stable all and most of the samples exposed to direct sunlight become dark. The problem is more obvious with water Colour with Tempera binder.

Vermilion has been used in the murals almost in all periods after the classical era in Europe.

In painting Schools of the Islamic era (Seljuk, Patriarch, Herat, Tabriz, Qazvin and Esfahan School) also vermilion has been widely used for painting on paper and wall painting. Because of the nature and excessive brightness of this Colour, its application in Iranian painting spread and like minium, is considered as characteristics of Iranian painting. In the wall paintings of the Safavid era, cinnabar pigment has been
used repeatedly. Especially on the wall paintings of the Reza Abbasi School which have been very well maintained.

8. Gold sheet and powder

The Gold sheet and powder was used to make the background or details in painting. Gold is of the most malleable and softest of metals. Therefore, it can be made into a very thin sheet and cover wide surfaces. There are various methods for the preparation of powdered gold. Direct grinding or wearing cannot be used for this purpose because gold is very soft and shapeable.

Oily gilding and gold sheet has been used in the decorative wall paintings of the Safavid period, and in a part of the Reza Abbasi school wall painting in Chehel Soutun palace.

“Oily gilding is done after transferring a design on the wall (Sombh) with plaster coating and brief delineation, attempting to highlight patterns. To do this, red clay (a red soil in nature) with animal glue binder was used and desired designs were prepared of 1 to 2 mm. Then by putting a layer of oil on the relief part, at the appropriate time when oil turned sticky, gold sheet was set on it. This technique has been used more in the wall painting decoration of Chehel Soutun and azure blue has been used for background. (Combination of azure blue, a cool Colour, and as a background for the gold Colour, which is a warm Colour, created a very beautiful and rich from the perspective of Colour aesthetics)” 32(PL227)

9. Orpiment

Orpiment is a mineral material consisting of arsenic and sulfur, which is termed arsenic sulfur in chemistry, and of two types: orpiment yellow and red. Orpiment pigments are considered to be highly consumed pigments that have had many applications especially in the East. In the wall paintings of the Reza Abbasi School in the Chehel Soutun Palace, orpiment was used as yellow, bright and brilliant golden in pure form or with white lead. Moreover, by adding indigo Colour, dark grass green was obtained, which had very good stable conditions like oval Tempera. (PL228)

10. Iron (Akhra)

Iron is a natural earth pigment including silica and clay and its Colour depends on the hydrated or non-hydrated iron oxide existing in it. Iron yellow may also have
some impurities such as gypsum, magnesium, carbonate, etc. in addition to iron minerals. This product in its natural origin is found in different Colour shades from opaque light yellow to reddish brown. Using Iron yellow pigments dates back to the earliest periods of history and was known and used in Egypt, Rome and the Orient. Now, it is used in almost all parts of the world. This dye combines very well with almost all binders’ water-soluble (Tempera) binders and also with non-water soluble binders, such as oil and some resins. During the Safavid dynasty, this dye was used for construction and decoration and painting on plaster.

Natural and organic Dyes

1. Azure Blue or Indigo

Herbal blue dyes are dyes that have been used for painting and dyeing yarns since ancient times in the Far East. This pigment is probably of Hindi origin, until the discovery process of making synthetic indigo was the main azure dye source throughout the world. In addition, the indigo dye was known in ancient Egypt who was using it since early times.

For preparing this dye, freshly picked plants are steeped and poured in big barrels and left to be fermented. Indigo particles are deep purple-blue and have a bronze shining. Indigo has a weak Colour power and a thin layer of its Colour is seen as green and blue when exposed to light. This dye was used in oil dyeing works but its application in Tempera and water Colour is more successful. However, a thin layer of indigo becomes Colourless when exposed to sun light. This is one of the Colours that Iranian painters were much interested in and it has used in Iranian miniature paintings. Indigo has also been used in the wall painting of Chehel soutun palace (Reza Abbasi School). For example, the Central Hall of Chehel soutun palace, where the Colour layer has remained good and healthy, but on the outer facade, there is no Colour layer of painting left due to excessive wear out. (PL229, PL229A)

2. Red (Kermes) ink or Carmine

“Carmine is one of the oldest dyes, which was extracted from the body of a female insect called Cocous Ilisisis living on oak trees in the Southern Europe. It has been said that this dye, probably with alum seeds was used for dyeing leather in ancient Egypt.
The term Red (Kermes) is originally an Arabic word and the English word Crimson has been adapted from it.  

“Kermes is not clear in form; therefore, Hindi lac became its successor in the medieval era. In the experiments carried out on wall paintings of Chehel Soutun palace (Reza Abbasi School) and in Rome School Italy, in 1979, it was found that Kermes has been used for delicate painting of paints like the face and it has given a special beauty and crystallinity to the portraits which can be attributed to its clarity and spiritual mood”. (PL230)

Method of Preparing Pigments for Painting:

“For preparing pigments, first Coloured material pieces were washed and dried, then they were ground and powdered using stone or X-stone (X-stone is referred to a rounded stone usually found in the river side big enough to hold in one’s hand and used to rub the dye.) The powders obtained were slowly washed to wash out its additional materials and impurities and pure pigment was prepared for painting. Then a binder was added to the pigment. This binder was usually made of sugar and water or water and candy and sometimes a little honey. The binder ratio was very important as using disproportionate values could bring about problems. A change in preparation would cause a change in its covering property as well as brush fluency”.

Binders used in the Safavid era painting:

In general, chemical analysis for identifying binders used in the wall paintings of the Safavid period can be a very difficult task because these binders were exposed to rot and have lost their chemical and physical properties over time due to the presence of organic material.

According to studies done in the repair centre in Rome and consulting with old experienced masters with and studying old books, it can be said that the binders used to obtain the desired dyes were hot Arabic gum and a special wax. Of other binders used is egg yolk and this method has been popular in Europe known as Tempera giallo di uova, and has had widely application in the paintings on board and their wall paintings.

In general, the gums used as binder for the mentioned dyes include:

1. Solution of plant glue powder
This solution was used with water after filtering.

2. **Egg yolk**

Egg yolk was used as binder after adding a few drops of vinegar to it and too much mixing and settling of the main material.

3. **Animal glue (glue)**

   Its usage was in places that had too much dye consumption. In addition, it was used for supporting layers of Colour and also for preparation of the Chinese layer (supporting layer for gilding).

4. **Cooked oil**

   “Probably oil paint technique and method brought to Iran by European painters by the order of the Safavid kings in Esfahan, was popular at that time. However, studies have indicated that the first group of paintings done in Iranian style and technique including decorations of wall flower design paintings (decorative painting), the pictorial wall paintings, had Arabic gum with animal glue. Second group of pictorial paintings in the internal view have had egg yolk or Arabic gum and wax binder are in very good condition. However, all the paintings done with oil paint having lead-white, in the outer facades, have undergone chemical changes and have been converted into black and grey (All the dye and oil paintings of the north and the south small verandas in Chehel soutun palace have become black)”.

5. **Arabic gum**

   This gum is extracted from a particular plant found in Egypt, Arabia and Africa. However, it is abundant in India and Australia.

   The best brand of Arabic gum is white, transparent, brittle, and sticky and is like pearl. Its taste is slightly sweet and gets well dissolved in water. In water Colour, sometimes instead of the Arabic gum, tragacanth is used. Sometimes a drop of flax oil or almond oil or cow gut or glycerine is added to the solution of Arabic gum, which makes the layer of the combined dye or Arabic gum and prevents scaling of paint layer.

   In the decorative wall paintings of Chehel soutun palace and other monuments of Safavid dynasty, Arabic gum has been used as binder; after observing dye layers, it was found they were all water-soluble.
6. Tragacanth

Tragacanth is a gum extracted from goats’ thorn. For its preparation, goats’ thorn is usually bladed; all species of goats’ thorn have Tragacanth gum. Tragacanth is not soluble in water but forms a sticky glaze. Different Colours of tragacanth include white, yellow, pale and dark brown, and its gum, which is somewhat transparent, tasteless and slimy. The use of tragacanth as a dye binder especially in the Iranian seven Colours tiles has been common since ancient times and retains this usage. Yet, Tragacanth can be served as a final stabilizer of Tempera paintings. One of its main characteristics of is that it does not create any change in the Colour layer and maintains the appearance of the tissue and condition of the Colour. This substance has been used as stabilizer in the murals of the historical buildings of the Safavid era.

“For using tragacanth as binder, first some tragacanth is poured in a container of water, and the next day, when tragacanth emulsifies and becomes loose, it will be passed through a fabric filter and made ready to be mixed with the dye”.

7. Glue

Glue is a plant with land flowers and with thick glace underground stems. It is used as gum after pounding. This plant has probably been used as binder in Iran after Islam.

8. Eggs

Use of egg yolk and white by the ancient Egyptians has been common. Some researchers believe that the worn dyes were mixed with concentrated oil and egg yolk and by adding some water, made it ready to use in the past. In addition, the combination of egg with animal glue and water and oil has been used for dying in the older days.

“Egg yolk has an emulsion containing water, albumin, lipids, minerals … Using egg yolk makes the dye layer dry quickly and allow the painter to apply the second layer over the primary dye. When egg yolk is used as the dye binder, over time, layers of dried dye, form a hard layer due to evaporation of the water layer dye and also because of the gradual hardening of oil. Egg white is entirely different from the egg yolk combination and was used as binder. Most probably, egg has been used as binder in the pictorial painting of Reza Abbasi School Chehel soutun palace and it has been used as a binder on the four great central hall of boards.”
Aesthetically Characteristics of Srirangapattana:

“Indian art evolved with an emphasis on inducing special spiritual or philosophical states in the audience, or with representing them symbolically. According to Kapila Vatsyayan, "Classical Indian architecture, sculpture, painting, literature (kāvya), music, and dancing evolved their own rules conditioned by their respective media, but they shared with one another not only the underlying spiritual beliefs of the Indian religio-philosophic mind, but also the procedures by which the relationships of the symbol and the spiritual states were worked out in detail."\(^ {40}\)

“Indian paintings provide an aesthetic continuum that extends from the early civilization to the present day. This form of art in India is vivid and lively, refined and sophisticated and bold and vigorous at the same time. From being essentially religious in purpose in the beginning, Indian paintings have evolved over the years to become a fusion of various traditions which influenced them”.\(^ {41}\)

Painting in India has a very old tradition, with ancient texts outlining theories of colour and aesthetics and anecdotal accounts suggesting that it was not uncommon for palace beholds to paint their doorways or facades or even indoor rooms where guests were received. Cave paintings from Ajanta, Bagh and Sittanvasal and temple paintings testify to a love of naturalism-both in the depiction of the human form and in the depiction of nature. The most famous surviving Buddhist paintings are from the caves at Ajanta. In Ajanta, we also see the emergence of a style that appears again and again - the ability to draw abstractions from nature in a manner that is both aesthetically pleasing and very effective as a decorative embellishment. Illustrations on palm-leaf manuscripts of Jain and Buddhist texts in Gujarat around the 12th century have strong resonances of folk paintings.

Aesthetic Characteristics of Indian painting:

It is essential to study the history and aesthetic characteristics of Indian painting in brief before starting discussion on the Srirangapattana painting aesthetics. Indian painting manifests a perfect harmonization of life, expression, and emotion. In its various styles it delivers an innovative aesthetic perception to one and all.

Indian art has a very long and illustrious history. Painting as an art form has flourished in India from very early periods as is evident from various epics and other
literary sources; and also from the remnants that have somehow survived the test of time, vagaries of nature and vandalism—wanton or otherwise caused by humans.

The main characteristic of Indian art has been its remarkable unity and consistency. Though there were regional variations and individual styles, the works produced in diverse geographical and cultural regions shared certain common values, concepts and techniques. And, all those varied manifestations were inspired by a common general principle. The regional idioms, nevertheless, contributed to the richness of Indian art, and their mutual influences gave birth to multi-faceted development of Indian art.

That was true not merely of the classical paintings but also of the art works and paintings created by the village craftsmen and artists. Since there never was a nodal body to preserve and develop art in India, it was the initiative, enterprise and imagination of those dedicated humble artists that kept alive the ancient traditions. Their exquisite themes inspired by life around them, painted in their homemade bright Colours employing indigenous styles have enriched the cultural diversity of India.

Another significant feature of the ancient Indian art was its vision of life and its world view. That inward vision and a sense of peace and tranquillity are its hallmarks. The old paintings serve as a valuable record of the thoughts and aspirations of our ancestors. These ancient arts present the world as a great harmony that blends seamlessly into the whole of creation. It recognizes the oneness that exists in all of us, in the animals, the flowers, the trees, the leaves and even in the breeze which moves the leaves. All are seen as a manifestation of That One.

Indian art is often classified as religious art, though not all Indian art is purely religious, and some of it is only nominally so. The impression was perhaps grafted by the contemplative imagery presented by the ancient Indian art. But, the art, in general, was inspired by life, by reflecting upon human concerns and aspirations; and celebrating and delighting in the life of this world.

Even the religious art is not sectarian. It is at once Hindu, Buddhist and Jain, for its style was a function of time and region and not of religion. Thus, it is not strictly correct to speak of Hindu or Buddhist art, but, rather, of Indian art that happened to render Hindu or Buddhist themes. For example, an image of Vishnu and an image of
Buddha of the same period are stylistically the same, religion having little to do with the mode of artistic expression. (PL231, PL231A)

The Indian art that rendered religious themes shared a common pool of symbols and avoided imitation of the physical and ephemeral world of the senses. For instance, in all the Hindu, Jaina and Buddhist themes (PL232, PL232A, PL232B, PL232C), alike, the Chakra - the revolving wheel of time symbolizes the cyclical rhythms of all existence; the Padma - or the lotus embodies creation - that springs from the bosom of the earth; the Ananta (represented as a snake) symbolizes water - the most important life-giving force from which all life emerges, evolves and then resolves; the Swastika (PL233) represents the four-fold aspects of creation, motion and a sense of stability; the Purnakalasha (PL234) the over-flowing pot symbolizes creativity and prosperity; the Kalpalata and Kalpavriksha - the wish-fulfillment creeper symbolize imagination and creativity; and, Mriga - or deer – symbolizes desire and beauty. (PL235), (PL236)

Similarly there were common set of gestures (mudra) by position of fingers, hands, limbs; and by stance of images in paintings and in sculptures. These varied mudras made explicit the virtues such as wisdom, strength, generosity, kindness and caring etc. (Pictures237) the similarity to Buddhist iconography is obvious, but Jain Tirthankaras can be distinguished by the nudity of their figures.

The objects depicted in Indian art evoked an imagery or represented an idea that sprang from the mind. That might perhaps explain the relative absence of portraiture and even when it was attempted the emphasis was on the ideal person behind the human lineaments rather than on the physical likeness.

Another feature is the absence of the sculptures and other representations of rulers or rich patrons. And, hardly any sculpture or painting bears the signature or the name of its creator. That might again symbolize a move from particular to the universal. But, it surely baffled generations of historians.

Indian figurative art is therefore not mere portraiture of the specific; but is a symbol pointing to a larger principle. It is akin to the finger pointing to the moon. For instance the image or the painting of the Buddha could be seen as that of the Buddha the historical prince Siddhartha Gautama and Sakyamuni. But, it is more than that. The Buddha –figure is the embodiment of all the compassion, pathos and grace in absolute.
Often, certain symbols surrounding the Buddha-image are meant to amplify its message. For instance, the idea of reverence and holiness could be represented sometimes by the surrounding vegetation, flora, fauna, yakshis, gandharvas, and apsaras (PL238) each playing a specific role in building a totality; or it may be the single austere simple statement of the still centre of peace and enlightenment suggested through the symbols of the Buddha such as the Bodhi tree, seat, umbrella, sandals, footprints etc.

The Buddha–image is, thus, at once particular and universal. The spirit and soul of the Buddha is contained in the body of the particular but impersonalized form; the serene mood of compassion it portrays is everlasting and universal.

The earliest substantial specimens of Indian painting, that have survived, are the murals found in caves of Ajanta and in Kailashnath temple at Ellora. The Cave temples at Badami in Karnataka, and Sittanavasal, in Tamil Nadu too contain paintings of similar style. (PL239, PL239A, PL239B, PL239C) But, the most well-known of them all is the set of murals on the walls in Ajanta caves, probably of the early 6th and 7th centuries. It followed the golden age of the Guptas. They depict the tales of the Buddha in his previous births on his way to enlightenment. Bodhisattva Padmapani, the bearer of the Lotus is painted amidst playful monkeys and joyous musicians. (PL240) yet, amid all that activity, the Bodhisattva looks within in tranquil harmony. There is a sense of sublime peace that pervades this figure, which is one of the masterpieces of Indian art. And, on the ceilings of the caves are the illustrations of the teeming life of the world, its flowers and fruit, the animals of the world and mythical creatures. (PL241, PL241A) The murals also bring to life an innumerable variety of other persons such as princesses, maids, soldiers, guards, mendicants, merchants etc.

The artists of Ajanta, who created those valuable treasures of the art world, were the inheritors of an ancient tradition that painted and decorated palaces, temples and caves. The theories, principles and techniques followed by those artists came down to them through oral traditions bequeathed by a long line of artists spread over several generations. (PL242)

The artists of Ajanta were also inspired and guided by the principles and techniques described in texts such as the Chitrasutra of the Vishnudharmottarapurana, which attempted to preserve the ancient and pass it on in its purity to the
subsequent generations. The main characteristics of the Ajanta paintings are the use of free flowing lines for delineating beautiful figures and their delicate inner feelings; together with the use of shading different parts of the body to produce three dimensional effects in the images. The other was use of proper Colours at times contrasting and at times matching, to create magical effects. These were precisely the principles that Chitrasutra emphasized repeatedly.  

**The Chitrasutra of Vishnudharmottara**

Vishnudharmottara is dated around sixth century AD, following the age of the Guptas, often described as the Golden Age of Indian Arts. It is perhaps the world’s oldest known treatise on art. However, not much is known of its author, as is the case with most Indian texts. Vishnudharmottara follows the traditional pattern of exploring the various dimensions of a subject through conversations that take place between a learned Master and an ardent seeker eager to learn and understand. Chitrasutra too employs the pretext of a conversation between the sage Markandeya and King Vajra who seeks knowledge about image making (shilpa).

“...The Vishnudharmottara Purana or the Vishnudharmottara (as it is usually referred) is a supplement or an appendix to the Vishnu-purana. It is generally believed to be a later insertion into Vishnu Purana. The part three of the Vishnudharmottara gives an account among other things, of the then known branches, theories, methods, practices and ideals of Indian painting. The text deals not only with its religious aspects but also, and to a far greater extent, with its secular applications. It initiates the aspirant into a world of joy and delights that only the Colours, forms and representation of things seen and unseen can bring forth.

Chitrasutra is that part of the Vishnudharmottara which deals with the art of painting. Its compiler described it as “the legacy of the collective wisdom of the finest minds. Explaining why he took up the compilation, he said he was prompted by his concern for the future generations; for their enlightenment, delight and quality of life. He said it was his firm belief that paintings are the greatest treasures of mankind as they have the aura and power to beneficially influence the minds and lives of the viewers.”

**The Chitrasutra of Vishnudharmottara, in a little more detail:**

Great paintings are a balm on the troubled brow of mankind.
Of all arts, the best is chitra. It is conducive to dharma and has the virtue to liberate (emancipate) an individual from his limited confines wherever it is established—in home or elsewhere—a painting is a harbinger of auspiciousness. Art is the greatest treasure of mankind, far more valuable than gold or jewels.

The purpose of art is to show one the grace that underlies all of creation, to help one on the path towards reintegration with that which pervades the universe.

A painting cleanses and curbs anxiety, augments future good, cause’s unequalled and pure delight; banishes the evils of bad dreams and pleases the palace hold deity. The place decorated by a picture never looks dull or empty.

The Chitrasutra commences with a request by king Vajra to sage Markandeya seeking knowledge about image-making.

**Example of Chitrasutra painting making style:**

“He who paints waves, flames, smoke and streamers fluttering in the air, according to the movement of the wind, should be considered a great painter. “He who knows how to show the difference between a sleeping and a dead man; or who can portray the visual gradations of a highland and a low land is a great artist”.

The sage then instructs that without the knowledge of music one cannot understand natya. And, without the knowledge of natya one can scarcely understand the technique of painting. “He who does not know properly the rules of chitra (painting) declares the sage “can scarcely discern the essentials of the images (shilpa) (sculpture)”.

The Chitrasutra says “it (natya) guides the hand of the artist, who knows how to paint figures, as if breathing, as if the wind as blowing as, if the fire as blazing, and as if the streamers were fluttering. The moving force, the vital breath, the life-movement (chetana) are to be explicit in order to make the painting come alive with rhythm and force of expression. The imagination, observation and the expressive force of rhythm are the essential features of painting”. The Chitra sutra recognized the value and the significance of the spatial perspective too.

The Shilpa (sculpture) and Chitra (painting) are closely related to Natya (dance) in other ways too. The rules of the iconography prathimalakshana appear to have been derived from the Natya-shastra. The Indian sculptures are often the frozen versions or
representations of the gestures and poses of dance (caaris and karanas) described in Natya-shastra. The Shilpa and chitra (just as the Natya) are based on a system of medians (sutras), measures (maanas), postures of symmetry (bhangas) and asymmetry (abhanga, dvibhanga and tribhanga); and on the sthanas (positions of standing, sitting, and reclining). The concept of perfect symmetry is present in Shilpa and chitra as in Nrittya; and that is indicated by the term Sama.

The Natya and Shilpa shastras developed a remarkable approach to the structure of the human body; and delineated the relation between its central point (navel), the verticals and horizontals. It then coordinated them, first with the positions and movements of the principal joints of neck, pelvis, knees and ankles; and then with the emotive states, the expressions. Based on these principles, Natya-shastra enumerated many standing and sitting positions. These, demonstrated the principles of stasis, balance, repose and perfect symmetry; And, they are of fundamental importance in Indian arts, say, dance, drama, painting or sculpture.

Another aspect of the issue is that painting as a two-dimensional form, can communicate and articulate space, distance, time and the more complex ideas in way that is easier than in sculpture. That is because, the inconvenient realities of the three dimensional existence restrict the fluidity and eloquence of the sculpture.

The Indian artist never took in the world at a sweeping glance. He had an eye for details. Chitrasutra gives an elaborate classification of different types of men and women. They are classified into one of the five standard types called: Hamsa, Bhadra, Malavya, Ruchakaand and Sasaka. Their respective measures were 108, 106, 104, 100, and 90 angles. Twelve angle or digits make one tala, which is the length of the palm from the edge of the wrist to the tip of the middle figure. Usually, the face of the image would measure a length of one tala, which, in other words, would be one-ninth of the body length of a Hamsa category image. The proportions of the various parts of the image body would be in terms of the tala and its denomination (the angula). Hamsa is the standard measurement of body-length of an image; and the proportions of the other categories of images (Bhadra etc.) are to be worked out by taking Hamsa asa bench mark.

Similar tala-mana system of proportions and measures governs the shilpa iconography. Its econometric prescribes the proportion of the limbs and other parts of
its body in relation to its face-length. The Indian artists are governed by proportions than by actual measurements. Thus a figure might look pigmy or colossal while the principles that govern the proportions would be the same. (PL245)

These rules specify the various standards to be adopted for ensuring a harmonious creation endowed with well-proportioned height, length, width and girth. These rules also govern the relative proportions of various physical features - of each class and each type of images. (PL246) In this picture, composition the central figure is given importance and the other figures; and that leads to the heightening of the fundamental emotions or fuller expression of the central figure for which alone the others exist.”

The characteristic features of the five categories of male form by Chitrasutra:

1. “- Hamsa (108 angulas) should be strong, with arms resembling the king of serpents, with moon-white complexion, having sweet eyes set in a good-looking face; and with lion-like waist and swan-like majestic gait. The deities are depicted in Hamsa category of style.

2. - Bhadra (106 angulas) is learned, is of the Colour of lotus; with full grown tapering round arms, hairy cheeks and elephant like step. The rishis, gandharvas, vidhyadharas, ministers and family priests are depicted under this category.

3. - Malavya(104 angulas) is dark like a mudga –pulse (kidney bean), good looking; with a slender waist, arms reaching up to the knees, broad shoulders, broad jaws and a prominent nose like that of an elephant. The kinnaras, nagas, rakshasas and domestic women are depicted under Malavya category.

4. - Ruchaka (100 angulas) is high souled, truthful and clever. He is of autumn-white complexion and strong with a conch-like neck. Yakshas, vaishyas and prostitutes are depicted under this category

5. - Sasaka (90 angulas) is clever reddish dark and of a slightly spotted Colour; with full cheeks and sweet eyes. The tribal chiefs and sudras are depicted as Sasaka.” (PL247)
The characteristic features of the five categories of the female form by Chitrasutra:

As regards the female figures, they too fall under each of the above five categories. The figures of corresponding category (say Hamsa, Bhadra etc.) too should be depicted in proportions that are applicable to that category. But the size of the female figures should be smaller than that of the male figures appearing on the same canvass or surface. Her height should be made to reach the shoulder of the man placed near her, in proportion. Her waist should be two angular thinner than that of a man. On the other hand, her hips should be made wider by four angular. The breasts should be rendered soft, charming and proportionate to her chest.

“A female figure should be drawn with one foot calmly advanced and with the part about the hips and loins broad and flurried on account of amorous dalliance”.56 (PL248)

The women of good-family should be made bashful, wearing modest ornaments and not-showy dresses; and she with a slender waist depicted under Malavya characteristics. (PL249)

“The courtesans on the other hand should be painted with vermilion or emerald Colour, moon-like complexion or dark like the petals of blue-lotus. Her dress should be unrestrained, designed to excite and evoke erotic feelings. She should be painted as a Ruchaka character”57. (PL250)

Another characteristic

The Chitrasutra then goes to describe in great detail the characteristic appearances of country folk, the nobility, widows, courtesans, merchants, artisans, soldiers, archers, door-keepers, wrestlers, monks, mendicants, bards, musicians, dancers and others. Vivid descriptions of their dresses, movements, habits, and features peculiar to their class are given in Chitrasutra. (PL251, PL251A, PL251B)

Features of the images:

There is a detailed enumeration of the features of the images of deities, kings and other class. The Chitrasutra also makes some general remarks of such paintings; and says:
• A painting drawn with care pleasing to the eye, thought out with great intelligence and ingenuity and remarkable by its execution of beauty and charm and refined taste and such other qualities yield great joy and delight.

• A painting without proper position, devoid of appropriate rasa, of blank look, hazy with darkness and devoid of life movements or energy (chetana) is considered inauspicious.

• A painting cleanses and curbs anxiety, augments future good, cause’s unequalled and pure delight; banishes the evils of bad dreams and pleases the house hold deity. A place decorated by a picture never looks dull or empty. (PL252, PL252A)

The front view, face, chest and abdomen should remain undiminished; but, it should grow narrow towards the waist from thighs and also from the shoulders. Its shoulders should be broad. The abdomen should neither be shrunk nor bloated. (PL253)

The deities should be drawn wearing strings of garlands and ornamented by crowns, earrings, necklaces, bracelets, ornaments of the upper arms, long girdles reaching up to the ornaments on their feet, and sacred threads with ornaments for the head. (PL254), (PL255, PL255A)

The text says, in general, an image possessed of all auspicious and beautiful marks is excellent from every point of view. Its mudras (gestures of hand and fingers) should be benevolent blessing people with welfare, peace and prosperity. Such an image would add to the wealth, crops, fame and the longevity of life of the worshipers. ” Blessed is the work of art that is endowed with auspicious marks as it is a harbinger of fortune, fame to the country, to the king and to the maker. (PL256)

The text also warns, when an image is devoid of these auspicious marks (lakshanas) it would cause destruction of wealth and crops. And, it instructs that such an image should therefore be made with great care, dedication and devotion.

Vidhyadharas should be shown with garlands and ornaments; and accompanied by their wives on either side. They should be shown either on land or in air, with swords in their hands. (PL257, PL257A)

As regards the depiction of great men such as kings and noble persons, the text recommends their images should possess the auspicious lakshanas associated with
greatness. Apart from that, it also mentions that their hands should reach up to their knees (a-janubahu). The hands and feet of a Cakravartin should be webbed (jala). The auspicious mark of small circle of hair (urna or tuft of hair) should be shown between their eyebrows. On the hands near the wrist three delicate auspicious lines slender curving should be drawn; as if scratched by a hare. (PL258, PL258A)

The hair should be made thin, wavy, shiny, with natural glossiness and like the dark blue sapphire. They should be properly ornamented. (PL259)

**Postures and perspectives:**

Chitrasutra mentions that an image could be presented in any number of positions; but categorizes nine positions as the leading attitudes. The nine postures, mentioned under, can perhaps be understood as stylized views, as they are the same figure viewed from different angles. That causes portraying the same figure, with altered body-proportions, because some parts are hidden from view while some others are prominent. The ratio of the head with the other limbs of the body has to be altered in accordance with the different postures and view positions (perspectives). Yet, the image should not look disproportionate. That has to be done by manipulating density of light and shades. These indicate that the Chitrasutra had a sound understanding of the spatial perspective of things.

The various positions and perspectives are achieved by what the Chitrasutra callas – kshaya and vridhi, (PL260) decrease and increase, which are the art and skill of foreshortening. The positions are:

(i)* Front view (rivagata);

(ii)* back view (anrju);

(iii)* bent position – in profile view (sat-chikrat-sarira)

(iv)* face in profile and body in three quarter profile (ardha-vilochana);

(v)* Side view proper (paravagata);

(vi)* With head and shoulder-belt turned backwards (paravritta);

(vii)* back view with upper part of the body partly visible in profile (prastagata);

(viii)* With body turned back from the waist upwards (parivrtta);
Foreshortening:  

Foreshortening is achieved, as the text says, by manipulating light and shadows with the aid of Colouring, shading with delicate cross lines, stumping and dots; and at the same time maintain the proper proportion (pramana) of the figure and its aspects.

“Weakness or thickness of delineation, want of articulation, improper juxtaposition of Colours are said to be defects of painting.”

A painting without proper position, devoid of appropriate rasa, blank look, hazy with darkness and devoid of life movements or energy (chetana) is inauspicious. “Proper position, proportion and spacing; gracefulness and articulation; resemblances; increasing or decreasing (foreshortening) are the eight good qualities of a painting.”  

The rich heritage of the country is a witness to various styles and forms of paintings since the introduction of art. Some of the most important and renowned styles of Indian Paintings are as follows: Mural Painting, Miniature Paintings, Madhubani Painting, Tanjore Painting, Glass Painting, Kalamkari and etc.

Types of presentations:  

The paintings were executed on various surfaces: wall paintings (bitthi), pictures on board (PLalaka), on canvas (pata), on scrolls (dussa-pata) and on palm leaf-manuscripts (patra). These rolls were often in the shape of lengthy rolls facilitating continuous representations. The Chitrasutra instructed that the surface chosen should suit the purpose of the proposed painting; and, in any case, it should be smooth and well coated. That would help achieve a better presentation of the painting.

As regards the shapes of the boards and scrolls, Chitrasutra mentions four types: sathya, realistic pictures in oblong frames; vainika-lyrical or imaginative pictures in square frames; (PL261) naagara-pictures of citizens in round frames; and misra– mixed types.

Indian mural painting  

Mural Paintings are the earliest remnants of Indian Art. Ajanta Murals include sculptures of animals, guards and deities. It also includes paintings of courtly life, scenes from the life of Lord Buddha and also has a few statues of the lord himself.
History records that the Ajanta Murals date back to the 2nd century BC. It would be interesting and perhaps necessary to discuss the technique and process of making Indian wall paintings which have been discussed in a special chapter of the Vishnudharamotaram\textsuperscript{61}, a Sanskrit text of the 5th/6th century A.D. The process of these paintings appears to have been the same in all the early examples that have survived with an only exception in the Rajarajeshwara\textsuperscript{62} temple at Tanjore which is supposed to be done in a true fresco method over the surface of the rock. (PL262)

Most of the colours were locally available. Brushes were made up from the hair of animals, such as goat, camel, mongoose, etc.

“The ground was coated with an exceedingly thin layer of lime plaster over which paintings were drawn in water colours. In true fresco method the paintings are done when the surface wall is still wet so that the pigments go deep inside the wall surface. Whereas the other method of painting, was followed in most of the cases of Indian painting is known as tempera or fresco-secco. It is a method of painting on the lime plastered surface which has been allowed to dry first and then drenched with fresh lime water. On the surface thus obtained the artist proceeded to sketch out his composition. This first sketch was drawn by an experienced hand and subsequently corrected in many places with a strong black or deep brown line when the final drawing was added. After the painter had drawn out his first scheme in red, he proceeded to apply on this a semi-transparent terraverte monochrome, through which his outline could be seen. Over this preliminary glaze the artist worked in his local colours. The principal colours in use were red ochre, vivid red (vermilion), yellow ochre, indigo blue, lapis lazuli, lamp black (Kajjal), chalk white, terraverte and green\textsuperscript{63}.

The murals of South India, which flourished in the kingdoms of Cholas, Vijayanagara and Nayakas are highly significant while studying the painting traditions of India.\textsuperscript{64}

**Colour**

Chitrashutra, in one of its passages, observes that delineation, shading, ornamentation and Colouring are the decorative aspects of a painting; suggesting that rekha, the lines that articulate the forms, are the real substance of a painting.
Colour is a major medium in painting. The emotions and moods are expressed through manipulating Colours, their density, tones, lines, light, shades etc. The ingenuity, imagination and skill of the artist discover their limitations here.

The Colours in a painting have a descriptive and also a suggestive significance. Colours bestow a personality to a figure and speak eloquently of its character and mood. Colours also carry rich symbolisms; they might depict the gunas such as the satva, rajas or tamasguna; and make explicit the essential character and attributes of an image.

The Ragamala attempted translating the emotional appeal of a Raga into visual representations. Each raga was personified by a Colour, mood, the nature surrounding the hero and heroine (nayaka and nayika). (PL263, 263A) It also elucidated the season and the time of day and night in which a particular raga is to be sung. The Colours, substance and the mood of the Ragamala personified the overall bhava and context of the Raga. It is a delightful amalgam of art, Colour, poetry and music. (PL264)

**Primary Colours and their derivatives:**

“Chitrasutra, mentions five primary Colours: white (svetha), yellow (pitha), black (krshna), green (harita) and red (raktha). At another place it mentions white, yellow, black, blue (shyama) and the Colour of myrobalan (the dried fruit of a bush that resembles a plum) as the five principal Colours.

The text says it would be impossible to enumerate the mixed Colours in the world created by the dexterous mixing of various Colours and their derivatives; the combinations are limited only by ones imagination and logic. The mixing of the Colours, in various shades and tones, is a mark of an artist’s ingenuity. There is no limit to the numerous finer varieties of tints that can be produced. Colouring should be natural.

It appears, the range of Colours employed by the ancient artists was wide enough to render with subtlety the local Colours of the objects.

Chitrasutra classifies the application of Colours into four categories: as those that are employed to depict

(i) the faithful representations of nature;
The true proportions but largely exaggerated size of the object;

Artificial qualities and perspectives of objects; and,

An admixture of the three. The text mentions five kinds of whites of light shade (gaura); and twelve kinds of whites of dark shades (shyama).

The light-whites are the: gold like white (rukma); ivory like white (dantagauri); white like the split sandal (sphuta -candana- gauri); autumn cloud like white (sharada- gana); and autumn moon like white (sharad –candraka- gauri).

Some other texts, which followed Chitrasutra give a slightly varied versions of the light-whites as: milk, pearl, silver, star or a conch-shell (Kasyapasilpa); Foam-white, champaka and karnikara flowers (Bana); and lime (Manasollasa).

The twelve dark (shyama) shades of white which are derived by the mixtures and manipulations of white with other Colours and shades, as mentioned in the text are: the mixtures with dark red (rakthashyama); with brownish red like the mudga pulse (mudga-shyama); with dark green like durva grass (durvankurashyama); with pale green (pandu-shyama); with greenish like topaz (haritashyama); with yellow (pithashyama); with brown like priyangu creeper (priyangu- shyama); with reddish brown like monkey’s face (kapi -shyama); with blue like blue lotus (nilothpala -shyama); with slight blue like casa bird (casa- shyama); with purple, lotus, red (raktotpalashyama); and with grey, dark like a dark cloud (Ghana shyama). The objects gain a character (vishesha) and a dimension with judicious intermixture of Colours.

The forms of a few other Colours:

Blue Colour is three kinds: with white predominating, with very little white; or with both in equal parts.

When blue is transformed a great deal it becomes green; and, it could be pure green or an admixture of white; and green with blue predominating. Blue with black and red becomes metallic blue (nila-lohitha). Blue is transformed variously while in association with anything applied as an astringent.

Blue tinged with yellow and white gives rise to a variety of Colours and shades; and to Blue-lotus Colour when shaded dark. “Thus beautiful paintings should be made greenish like durva sprout; Yellowish like wood-apple; and dark like mudga.”

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The kinds of red mentioned in Manasollas and Kasyapasilpa are: red lead (darada), crimson (sona), juice of lac (alaktarasa), blood red (raktha), soft red (mriduraktha), and red ochre (lohita).

“A painting in red and dark like the red-lotus (rakthothpala) becomes beautiful when combined with white lac, covered by a coating of lac and resin.”

Four kinds of yellow are mentioned in Kasyapasilpa: golden (svarna), yellow (pita), turmeric (haridra) and like pollen of lotus (pisanga).

As regards black, Kasyapasilpa mentions four shades: –of clouds (nila), of forest crow (shyam), of a peacock (kala), and of wing of a balck-bee (krshna). To that list Bana adds: light black like that of a buffalo; darker black like the face of a golangula monkey; black of the pitch dark night.

“A painting should be then very beautiful, when a learned artist paints it with golden Colours, with articulate and yet very soft lines, with distinct and well-arrangedgarments; and blessed with beauty of proportions and rhythm.”

**Colour pigments:**

The Colour pigments were made from mineral and vegetable Colouring substances (Rangadravyas) or dyes. Some Colouring articles includ: gold (kanakam), silver (rajata), copper (tamra), mica (abrakam), lapis lazuli’s (rajavarta), red lead (sindhura), lead (tavara), yellow orpiment (haritala- a bright yellow arsenic sulfide mineral), lime (suddhe), lac (lakshya), vermilion (hingulakam) and indigo (nila). (PL265)

Pure gold, which is costly, should be slowly ground on a stone slab with an instrument (tunda) having at its tip the virana grass.

The gold-powder thus prepared should be placed in a bronze vessel and melted over again. Thereafter water should be poured into it and then be stirred up time and again. Now water of the vessel should be so carefully shifted that the stone-dusts remain for their solidarity. In this manner, pure golden pigments, showing the hue of the luster of a newly risen sun, would be prepared. Thereafter, this gold-pulp should be mixed with a small quantity of vajralepa, should be placed at the tip of the brush and all ornaments, imagined as of gold, should be gilded therewith. When the gold applied in
painting becomes dry, it should be slowly rubbed with a boar-tusk as long as necessary to attain a brightness of lightning.”

**Shading**

Methods of producing effects of light and shade were considered very important for projecting three dimensional presentation of the image. Weakness or thickness of delineation, want of articulation, improper juxtaposition of Colours are said to be defects of painting.”

**Three methods to make shading:**

By crossing lines (pat raja)

By stumping (airika)

By dots (vinduja).

The first method of shadings called (patraja) on account of lines being in the shape of leaves. The airika method is said to be very fine. The vinduja method is restrained handling of the brush while planting dots patiently.

**Brushes and crayons**

The tools required for drawing and sketching. Vartika was a general term used to denote both a brush and a crayon or a pastel for drawing. It appears Tindu was a crayon too, of carefully burnt ebony twig; while kitta was black carbon prepared as a roll for sketching. Tulika was brush prepared, perhaps, out of animal hair like sable, squirrel and hog; and, of bird feathers. It is said, a painter used at least nine brushes for every Colour. A painting firmly drawn with a tulika, a magnificent hairy brush, on a canvas, dipped in juice of the best Durva grass cannot be destroyed; and it remains intact for many years, though washed by water.

**The task of painting:**

“The outlines ought to be drawn in yellow and red as a rule. “The painter should think of the proportionate size of the thing to be painted, and think of it as having been put on a wall. Then calculating its size in his mind, he should draw the outline marking the limbs. It should be bright in prominent places and dark in depressed places. It may
be drawn in a single Colour where comparative distinction is required. If depressed places are required to be bright jet black should be used.

At another place, the text mentions that outlines should be drawn with an oozing black and white brushes in due order fix them on the duly measured ground. Outline has to be filled with the first Colour-wash which could be either white or green. And it can later be filled with Colour in appropriate places.

Chitrasutra cautions that an inconvenient painting stance or a bad seat or thirst or restlessness or sloppiness or bad temper could spoil the picture.”

Aesthetic Characteristics of srirangapattana:

Style in painting is a particular way to do something. Style comprises of those distinctive characteristics that enable the observer to link an artwork with other works. Within stylistic groupings, evolutionary changes will occur over time, in both forms and imagery. These trends are generally referred to as stylistic development.

“During the 18th century, painting in Karnataka did not evolve into an extensive school following a tradition, nor did it grow into an individual style after assimilation of various influences from outside. But the assimilation of influences at this period helped in the refinement of the style at a later stage. In the mid-19th century during the rule of Krishnaraja Wodeyar, the tradition of painting transformed into a full-fledged school known as the Mysore traditional school of painting that is popular even today’.

Mysore became a great cultural centre where traditional painting of the Vijayanagara. School was given a new lease of life and new attire.

Mysore Paintings are characterized by delicate lines, intricate brush strokes, graceful delineation of figures and the discreet use of bright vegetable colours and lustrous gold leaf. More than mere decorative pieces, the paintings are designed to inspire feelings of devotion and humility in the viewer. The painter’s individual skill in giving expression to various emotions is therefore of paramount importance to this style of painting.

Themes:

Religious and mythological stories and anecdotes from the Ramayana, Mahabharata and Bhagavata Purana and Jaina epics form the primary basis of a large
number of Mysore traditional paintings, murals and illustrated manuscripts. Individual deities, court scenes, epic heroes and their achievements and battle scenes are also depicted.

**The theme of the Srirangapattana paintings:**

On reviewing the commitment of Tipu to the Islamic religion, it is obvious that he could not have chosen anything iconic. Being a Muslim there was no way he could have depicted anagrams from the Koran as the faith professes a total nonrepresentational of religious subjects. Islamic religion does not have a strong mythology, which could have been depicted. Landscape painting was not popular and the artists were not well versed with the technique. Floral designs used generously to adorn the palace could not have become the main theme for the important panels. So the only theme that was suitable for depiction was a scene from history similar to the practice of great Moguls like Akbar and Jahangir. Tipu probably spent days looking at Moghul miniatures of battle scenes or other historical renditions like the Persian Shahnama which were replete with several battle scene pictures, before he decided to let the artists begin their work in his palace. Hence the choice of theme becomes interesting here.

Another point to be considered is that this is probably the first time that such a theme was chosen in the history of mural tradition of Karnataka. Although the appearance of a historical figure is not new, a small portion of history being chosen to be depicted in parts is introduced here for the first time. A tradition is, hence set here and is also followed in a number of places later. The depiction of small portraits in miniature frames is superseded again in consequent years particularly in Mysore Jaganmohan palace and Surupura (Gulbarga Dist.) popularly known as the Garudadri style of painting.\(^7\)(pL267, PL267A)

**Techniques of the Srirangapattana paintings:**

“The first stage of Mysore Painting was to prepare the ground; paper, wood, cloth or wall grounds were variously used. The paper board was made of paper pulp or waste paper, which was dried in the sun and then rubbed smooth with a polished quartz pebble. If the ground was cloth it was pasted on a wooden board using a paste composed of dry white lead (safeda) mixed with gum and a small quantity of gruel (ganji). The board was then dried and burnished. Wood surfaces were prepared by applying dry
white lead, yellow ochre and gum, and walls were treated with yellow ochre, chalk and gum. After preparation of the ground a rough sketch of the picture was drawn with crayon prepared from the straight twigs of the tamarind tree. The next step was to paint the furthest objects such as sky, hill and river and then gradually animal and human figures were approached in greater detail. After colouring the figures, the artists would turn to elaboration of the faces, dress and ornaments including the gesso work (gold covering), which is an important feature of Mysore painting”.

Preparation of the wall:

During the 12th century another Sanskrit work known as Abhilashimarta chinramani or Manasollasa was compiled by King Some shwara of the Western Chalukyan dynasty. This has a separate and interesting chapter on painting, discussing the preparation of the wall, mixing of colours, their variations, the kinds of brushes to be used etc. for classical painters. This was an indispensable source as it even guided in the variety of poses and the preparation of forms of religious icons.

While describing the qualities of a painter, Basavabhupala advises that, ”Pictures or portraits should be painted on flawless walls by painters who are efficient, well versed in the techniques, proficient in drawing minute sketches, clever in measuring, skilful in drawing pictures, competent in applying colours and who put effort in mixing them.

The Sivatattvaratnakara discusses the technique of making brushes and crayons for basic sketch and the use and mixing of colours and gold for decoration, the artist when attempting to draw a painting or a portrait must understand the shape and measurement of the subject he wants to paint. For the artists of Srirangapattana this could have been an important source book.

To get a smooth and flawless wall there are two methods of painting the wall. One is the fresco buono and the other fresco secco. Fresco buono painting is done by using colour pigments on a plaster surface when it is wet. The work, if it is large the plaster is applied on is done in parts (Only one part at a time). Murals done with this technique can be found at Bagh and Shravanabelagola. (PL268, PL268A)

“In fresco secco, painting is done on finished plaster or clay surface. A mixture of powdered bricks and clay in fixed proportion are made. Next, gum, beeswax,
jaggery and oil, lime prepared out of burnt shells, pulp of bilva were added to it. This mixture was stored for a month and applied to the wall and later polished to give a smooth surface. There is yet another technique mentioned in the Sivatattvaratnakara. “Fresh buffalo hide should be made into small pieces and dried till the pieces become hard”. This is called ‘vajralepa’ or adamantine. This vajralepa should be placed in a strong mud vessel filled with water and heated. When it gets melted it is proportionately added to any colouring pigment to get a particular desired shade. Adding soft white sand and conch powder to this vajralepa; the wall is smeared with this paste three times and allowed to dry till the wall becomes glossy. Most of the murals in Karnataka have made use of this technique of preparing the wall. Francis Buchanan explains the following method of preparing the wall at Srirangapattana and the colours used by the artists which is almost first-hand information.

“The Archaeological Chemist working on the conservation of Daria Daulat Bagh paintings stated that a chemical analysis of the paintings was never undertaken and hence it is difficult to be sure as to the composition used by the artists of the period”.

Srirangapattana painting colours:

Indian painters have long been accustomed to the use of earthen colours for their paintings. These earthen colours are referred to as tempera. Their range of hues is small. Red ochre (gairika), yellow ochre (haritala), crushed lapis lazuli fat blue (neela), conch powder for white (sudha) and lamp black for black (kajjafa) are some of the main pigments. These primary colours were often mixed to derive secondary colours. At the Daria Daulat Bagh, it is the gold colour that was used that needs some mentioning.

At first sight, one would imagine that much gilding is used in the ornaments; but in truth not a grain of gold is employed. The workmen use a paper covered with false gilding. This they cut into the shape of flowers, and paste these on the walls or columns. The interstices are filled up with oil colours, which are all of European preparation. The manner of making this false gilded paper is as follows: take any quantity of lead, and beat it with a hammer into leaves, as thin as possible. To twenty-four parts of these leaves add three parts of English glue, dissolved in water, and beat them together with a hammer, till they are thoroughly united: which requires the labour of two persons for a whole day. The mass is then cut into small cakes, and dried in the
shade. These cakes at any time can be dissolved in water, and stretched thin with a hair brush on common writing paper. The paper must be put on a smooth plank and rubbed with a polished stone, till it acquires a complete metallic lustre. The edges of the paper are then pasted down on the board, and the metallic surface is rubbed with the palm of the hand which is smeared with an oil called gurna and then exposed to the sun. On the two following days the same operation is repeated: when the paper then acquires a metallic yellow colour, which however, more resembles the hue of brass, than that of gold. The gurna oil is prepared as follows- take three quarters of a maund,(about lb18) of agashayany (linseed oil), half a maund (lb 12) of the size called chunderasu, and a quarter of a mound of musambra, or alas prepared in the country. Boil the oil for two hours in a brass pot. Bruise the musambra: and having put it into the oil, boil them for hours more. In another made red hot, the chunderasu is to be put into it, which will immediately melt. Take a third pot, tie a cloth over its mouth, and strain into it the oil and musambra: these must be kept over a gentle heat, and the chundrasu added to them gradually. The oil must be strained again: and it is then fit for use.

The chundrasu is prepared from the milky juice of any of the following trees: (licus glomerata Roxb), Goni (which it called Ficus gonia), Bayla, Bayviml, gobali etc. It is therefore an elastic gum.

The oil used for painting consists of two parts of linseed, and one part of chunderasu.

“In white washing their walls, over the chunam or lime plaster, the workmen of Seringapatam first give a thin coat of Suday or fine clay: which is mixed with size, and put on with a hair brush. They next give a coat of whitening made of powdered Balapum, or pet stone, and finish with a coat composed of eight parts of Abracum, or mica, one part of powdered Balapum, and one of size. The Abracum is prepared from white mica, by repeated grindings, the finer particles being removed for use by washing them from the grosser parts. The wall, when finished in this manner, shines like the scales of a fish; but in the day time, the wall white washed with the powdered potstone alone”.

Murals were usually done by the master who had good Hastocbaya (a good hand) in producing good pictures. Inferior artists of mediocre talent were used to fill in colours bur the preliminary sketch was always done by the proficient artist. He was generally referred to as a craftsman (Chitrakara) and held a place of eminence in
society. The artists were invariably members of a guild; knew more than one art and were experienced in different media.  

Repainting occurs for many different reasons. Conquering dynasties get fresh paintings done on old ones, a particular idea may become irrelevant forcing a change or a particular subject may require replacement due to political pressures and so on and so forth.

**Renovation and Protection of Works**

Historical buildings along with a motivating sense of wonder induce us to learn more about past culture and architecture. Although they have architectural, artistic, aesthetic, historical, symbolic, spiritual, social and economic values, as they are considered symbols of cultural identity and social continuity of that region as well as a part of our heritage, at first glance the feelings are emotional.

Historical buildings determine the type of renovation and methods of stability and renovation is an opportunity to give recognition to these buildings. If the renovator is unable to understand properly, he will not only lose the creative opportunity but also will damage the building.

One of the prime factors that bring about changes in the world around us is the climatic conditions. Moreover, lack of maintenance strategies and natural disasters cause damages to the cultural and historical works.

**Disruptive factors in historical structures:**

1. **External Factors**

   **Natural factors**

   - Natural factors with immediate damages are attributed to natural disasters (earthquakes, Thundering and lighting, fires, floods, landslides and earth changed places)
   - Natural factors with gradual deterioration (climatic changes)
   - Physical factors (wind, solar radiation, changes in moisture, temperature changes, acid rains, air pollutants . . .)
   - Chemical and electrochemical factors in nature
   - Plant Disruptive Factors
Microbiological and biological factors
Combined factors
Social factors due to profiteering or peoples lack of awareness and wrong management practices in the third world societies.

2. Intrinsic and Internal Factors:

“These are due to poor operational techniques and lack of understanding of climate and available materials. In researches carried out so far in the field of artwork protection, major causes of failures and damages have been specified. Today, renovation experts use a variety of methods to reduce or eliminate damages that happens to painting over time. These findings provide useful information for painters to enhance durability of their works”78.

Modern renovators attempt to revive destroyed works of the old masters by using the most advanced technology in analysis of materials (especially pigments and binding medium).

Painting Damage Factors: Painting damage may occur in two ways:

- Pigments change their Colour and / or varnishes become yellow.
- Bonding Layers of paint is weakened due to different movements or internal pressure.

Factors involved in painting damage include:

Light

The most specific cause of pigment and varnish disColouration is the effect of light on them. The more the light intensity, the severe damage on the painting especially sunlight; because of ultraviolet rays, accelerates the destruction of the painting. Therefore, painters prefer to put their work in a shaded place.

Heat

Effect of heat is similar to the light effect. If a painting is to be under direct sunlight for a long time, its surface heat may even reach up to 40 to 50 ° C. As a result, the oxidation reaction is accelerated in the pigment and varnish and physical pressure of the painting speeds up. Therefore, the lower the temperature, the less or the damage
to the painting (Temperature of 20 °C is a suitable temperature for museum galleries). An important point is that the temperature should not vary. A content temperature, usually about 20 °C ensures the longevity of a painting.

**Humidity**

“Relative humidity (percentage of moisture in the air) is considered one of the most important factors in the changing pressures on a painting. The drier the air, the more the pressure on the pigment and underlying layers. In general, moist air is better than dry air for protecting painting works”.

**Preventive approaches**

The total effects of light, heat and humidity impose a pressure on the layers of paint that over time will result in the separation of the layers. In such a situation, the painting should be given to an expert for renovating.

**Cleaning work**

If the surface of the painting is very dirty, it can be cleaned with cotton smeared with distilled water (To ensure that the Colours are not removed while cleaning the painting, it is better to first impregnate the cotton with the cleaning material and test rub on one corner).

**Cleaning work of oil painting:**

*In an Oil Painting, if the surface is dark and fat, a small amount of white gas can be used but one should be careful not to resolve varnish on the work.*

**Cleaning work of Tempera painting:**

In the egg Tempera, a strong and lasting skin is formed on the work, which is resistant to soot and dust. However, it can be cleaned by gently rubbing a wet linen cloth over the paint surface and then, using a piece of silk the surface of the painting could be polished. It should be noted that the experts, who are in charge of protecting the art works, do the cleaning work basically, which means they remove the varnish layers and Colour of the worn material from the surface of the painting. This work is necessary for displaying the Colours that the painter has used. In many paintings, over time, some Colours undergo change and others remain constant. In addition, it should not be forgotten that the solubility of old varnish is reduced over time and thus the
degree of difference in varnish solubility and material-dye shell is reduced. Thus, should be taken that a solvent able to solve old varnish but not damage the material-dye shell must be used. Alcoholic solvents are suitable for this purpose, but while working, the toxicity problem of the released vapours should be kept in mind.

If the difference in degree of material-dye shell and varnish solubility is very small, conventional solvents are not suitable for cleaning (In this case, chemical reactors can be used).

“The chemical reactors, which include a range from soaps to sodium hydroxide, can cause breakup of molecular bonds of material. These reactors act on the painting surface and react against varnishes. Of late, application of enzymes, especially lipase (fat enzyme breaker) has become common. However, cleaning an old painting is a risky business. Studies show that in the process of cleaning, some materials are released from the pigment shell and their displacement may make the pigment hard and brittle. Therefore, as much as possible, it is necessary to place very thin layers of primary varnish on the painting”.

Repainting of Murals

Murals depicting historic events provide us a picture of the socio-political environment of the time, the cultural background of the people, their practices and beliefs and their economic conditions. Study of ancient murals is usually taken up for these qualities that one hopes to find. A point to ponder while studying ancient murals is the fact that the murals undergo changes over the years. A modern conservationist will try at best to clean and treat the paintings and retain the original painting to the greatest extent possible. Previously, repainting was done in the name of restoration. It is possible that the only way of conservation known was by erasing or modifying the panels and replacing them with new ones. So, changes that occur in paintings are chiefly during repainting. The changes may not be too grave to the extent of changing the subject but subtle alterations in line or colour can dampen the study of style to a great extent.

Renovation of Chehel Soutun palace

“Amidst the pages of foreign travel logs it is inferred that from 1300 lunar years onward too much damage has happened in this palace and other Safavid buildings and
many exquisite decorations of this building such as integrated mirrors, and inlaid and painted doors and amazing windows have been looted. (For example, Sheikh Jaberi Ansari in his book History of Esfahan and Ray writes: "I remember the woven carpet at the Chehel soutun entry showing a child on a rope of which, each piece was purchased at a high price and due to the resulting imprudence in the years 1298 to 1305 AH, this piece of carpet vanished")  

“Considering that most of the historic wall paintings in Iran have been implemented with Tempera technique, protection of these works is one of the foremost concerns of the Iran Cultural Heritage Organization. Various factors such as humidity, temperature and light gradually caused loss of original properties such as the layer of paint, becoming fragile corrosion and colourlessness of the artwork. Chehel soutun palace paintings have been renovated and restored many times and reconstruction experts have been able to maintain its appearance configuration so far”.

Painting Repairs at Chehel soutun were started by Sarkis Khachaturian. After him and during the subsequent period, the work is done by people like Haj Mirza Aqa Emami, Jafar Rashtian, Haj Hussein Musveralmky, and Javad Rostam Shirazi in the years between 1320 to 1327 A.H. The method of working of these persons who were all painters and miniaturist was as the style of the main painters who worked in building and includes measures such as strength, Colour renovation, and completing reconstruction of shortages in paintings parts with little interference and possession. They recreated the old paintings in which the protective layer had become dark and Colour was scaled or in parts damaged or had Colour mixing using oil painting technique (with respect to size, dimensions and Colour that the original painters had used; by completing defected parts). They have considered the old-style paintings so that they could imitate the original design on the painting. Later (40 decades. A.H.) The Italian Institute of Izomo began research and renovation of historical monuments in Esfahan including the palace of Chehel soutun. Oljinio Galdibiri, expert in renovation of historical monuments (painting) and Roberto Cherbino were in this group of architect’s engineers who played an important role in the renovation of Chehel soutun paintings. This delegation also had the cooperation of Iranian experts, including Er. Ayatollah Zadeh Shirazi, Dr. Jabal Ameli, and Er. Morteza Freshteh Nezhad, in the field of architecture, and Mr. Hussein Aqajani Esfahani and Mr. Njarzadgan in the field of historical monuments renovation. Experts of this period cleaned the annexed Colours
of artists from many paintings of the past period and in some parts, left unchanged their work due to aesthetic issues and laws governing the scientific renovation\(^3\) (pL269, PL269A)

**Conservation of paintings at DariaDaulatBagh:**

“One excellent example of a historical mural that underwent many changes is the mural of DariaDaulatBagh in Srirangapattana. The paintings are represented in three different schemes delineated on the eastern and the western walls of the palace. On the western wall is the picture of a battle scene and its proceedings depicted in four frames, narrating the battle of Polillur in action. The paintings were commissioned in 1784 by Tipu Sultan to commemorate his victory over the British. In later years these paintings began to undergo as many changes as there were in the political showground. Apart from the murals on the walls of Daria Daulat Bagh the outer walls of Srirangapattana are supposed to have contained demeaning pictures of the British. During the last siege of Srirangapattana, a lot of these paintings were obliterated. And before that in 1792, on the approach of Lord Cornwallis’s army, a positive order to whitewash all the walls was given by Tipu. An order for the defacement of the Daria Daulat Bagh paintings was also issued at the same time. The paintings frequently faded and were repainted, and at each repainting some details were omitted or altered. On the eastern wall are two huge panels containing portraits. These distinctly show signs of modifications”.  \(^4\)

The chemical officer in charge of the conservation of paintings at Daria Daulat Bagh informed that no chemical treatment had been done on the paintings. So it is difficult to be sure about the colours used. This information is indeed surprising because there is substantial proof that the paintings were repainted and it could not have been possible without an analysis of the colours used previously. In cases where the colours don't match the results can be disastrous. In some areas a variation in colour is clearly visible. These could have been left by the previous attempt at saving the paintings. Measures used for the conservation of the paintings by the museum authorities are undoubtedly insufficient. (PL270, PL270A)
REFERENCE AND NOTES

Chapter-5.

1. The Parthian Empire (247 BC – 224 AD), also known as the Arsacid Empire after the eponymous founder was a major Iranian political and cultural power in the Ancient Near East was founded in the mid-3rd century BC by Arsaces I of Parthia, leader of the Parni tribe, when he conquered the Parthia region roughly western Khurasan.

2. Pakbaz, Ruyin (1383), p. 52

3. Pakbaz, Ruyin (1378), p. 53

4. Ibid, p.53

5. Ibid, p. 54

6. Pope, Arthur Upham, Parviz Natel, Khanlari (1338), Masterpieces of Persian Art, pp.46-47

7. Nezami Ganjavi was a 12th-century Persian poet. Nezāmī is considered the greatest romantic epic poet in Persian literature, who brought a colloquial and realistic style to the Persian epic His heritage is widely appreciated and shared by Afghanistan, Azerbaijan, Iran, and Tajikistan.

8. Nur ad-Dīn Abd ar-Rahmān Jāmī is known for his achievements as a scholar, mystic, writer, composer of numerous lyrics and idylls, historian, and one of the greatest Persian and Sufi poets of the 15th century. He was recognized for his eloquent tongue and ready at repartee that analysed the idea of the metaphysics of mercy. Among his famous poetical works are: Haft Awrang, Tuhfat al-Ahrar, Layla wa -Majnun, Fatihat al-Shabab, Lawa’ih, Al-Durrah al-Fakhirah.

9. Pakbaz, Ruyin (1383), Naqqashi-e Iran az dirba ta emruz, p.63

10. Pakbaz, Ruyin (1378), Encyclopaedia of Art, Persian painting

11. Ibid.

12. Pakbaz, Ruyin (1383), Naqqashi-e Iran az dirba ta emruz, p.63-65

13. Aqhajani Esfahani, Hossein, Asghar Javani (1386), Wall-painting during Safavid Dynasty in Esfahan, p. 13

14. Seyed Hossein Nasr (born April 7, 1933 in Tehran) is an Iranian University Professor of Islamic study at George Washington University, and a prominent Islamic philosopher. He is the author of many scholarly books and articles.

15. Seyed Hossein Nasr, (1375), Islamic art and spirituality, p.173-175

16. Aqhajani Esfahani, Hossein, Asghar Javani (1386), Wall-painting during Safavid Dynasty in Esfahan, p.13

17. Ibid., p.13

18. Ibid, pp.13-15

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The Achaemenid Empire (ca. 550–330 BCE), also known as the Persian Empire, was the successor state of the Median Empire, ruling over significant portions of what would become Greater Iran. The Persian and the Median Empire taken together are also known as the Medo-Persian Empire, which encompassed the combined territories of several earlier empires. It was the largest empire in ancient history of Iran.
Kalasha, also spelled as Kalash and kalasa is a metal (brass, copper, silver or gold) pot with a large base and small mouth, large enough to hold a coconut.

Yakshis, in the mythology of India, a class of generally benevolent nature s Gandharva is a name used for distinct mythological beings in Hinduism and Buddhism; it is also a term for skilled singers in Indian classical music. Pirits who are the custodians of treasures that are hidden in the earth and in the roots of trees.

Apsara celestial nymph is typically the consort of a gandharva or heavenly musician.

Chitra Sutra was first detailed in Vishnu Dharmottara, a Purana, dedicated to the science of arts, particularly paintings and has been around for more than 1800 years.

The Ajanta Caves: Ancient Paintings of Buddhist India, by Benoy K. Behl and Milo Cleveland Beach.

Markandeya is an ancient rishi (sage) from the Hindu tradition, born in the clan of Bhrigu Rishi. He is celebrated as a devotee of both Shiva and Vishnu and is mentioned in a number of stories from the Puranas.

Vajra was Aniruddha's Son and Sri Krishna's great-grandson. His mother was Aniruddha's wife, the Daitya princess Usha. Krishna just before his death made Vajra the King of Yadava dynasty at Indraprastha.


Ibid

The Natya Shastra is an ancient Indian treatise on the performing arts, encompassing theatre, dance and music. It was written during the period between 200 BC and 200 AD in classical India and is traditionally attributed to the Sage Bharata.

Tāla, Taal or Tal is the term used in Indian classical music for the rhythmic pattern of any composition and for the entire subject of rhythm, roughly corresponding to metre in Western music, though closer conceptual equivalents are to be found in other Asian classical systems such as the notion of usul in the theory of Ottoman/Turkish music.

Talamana is a traditional system of Indian econometric based on the Shilpa Shastras which uses certain measurements and proportions in creating temple icons and images.


Kramrisch, Stella (1928), the Vishnu dharmottara Part III, A Treatise on Indian Painting and Image-Making, p.38-42

http://ssubbanna.sulekha.com
Vidyadharas are a group of supernatural beings in Hindu mythology. They possess magical powers and dwell in the Himalayas. They also attend God Shiva, who lives in the Himalayas. They are considered as Upa-devas, semi-gods.

The Vishnudharmottara Purana is a Hindu text, encyclopaedic in nature. Along with the narratives, it also deals with cosmology, cosmogony, geography, astronomy, astrology, division of time, pacification of unfavourable planets and stars, genealogies (mostly of kings and sages), manners and customs, penances, duties of Vaishnavas, law and politics, war strategies, treatment of diseases of human beings and animals, cuisine, grammar, metrics, lexicography, metrics, rhetoric, dramaturgy, dance, vocal and instrumental music and arts.

The Rajarajeswara temple is a Shiva temple located at Taliparamba in the Kannur district of Kerala, South India.

Ragmala or Ragamala literally means a 'garland of Ragas, or musical melodies'. "Mala" means "garland", while "Raga" is a "musical composition or mode", which has also given rise to the series of Ragamala paintings.

Jaggery is a traditional unrefined non-centrifugal whole cane sugar consumed in Asia, Africa, Latin America, and the Caribbean. It is a concentrated product of cane juice without separation of the molasses and crystals, and can vary from golden brown to dark brown in Colour.

Krishnamurthy (1998), Ancient Indian furniture, p172.
77 Ibid, p.165-166
78 Ibid, p.167
79 Pakbaz, Ruyin (1383), Naqqashi-e Iran az dirba ta emruz, p.17
80 Ibid, pp.17-18
81 Aqhajani Esfahani, Hossein (1359), Aqhajani, Esfahani, Hossein, 1359, Repair Painting, no.1
82 Razani, Mehdi (1386), Introduction to the special terms of painting conservation and restoration, Journal, no3
83 Aqhajani Esfahani, Hossein, Asghar Javani (1386), Wall-painting during Safavid Dynasty in Esfahan, p.32
84 Veena Shekar, Repainting of Murals, http://www.chitralakshana.com/repainting.all about India