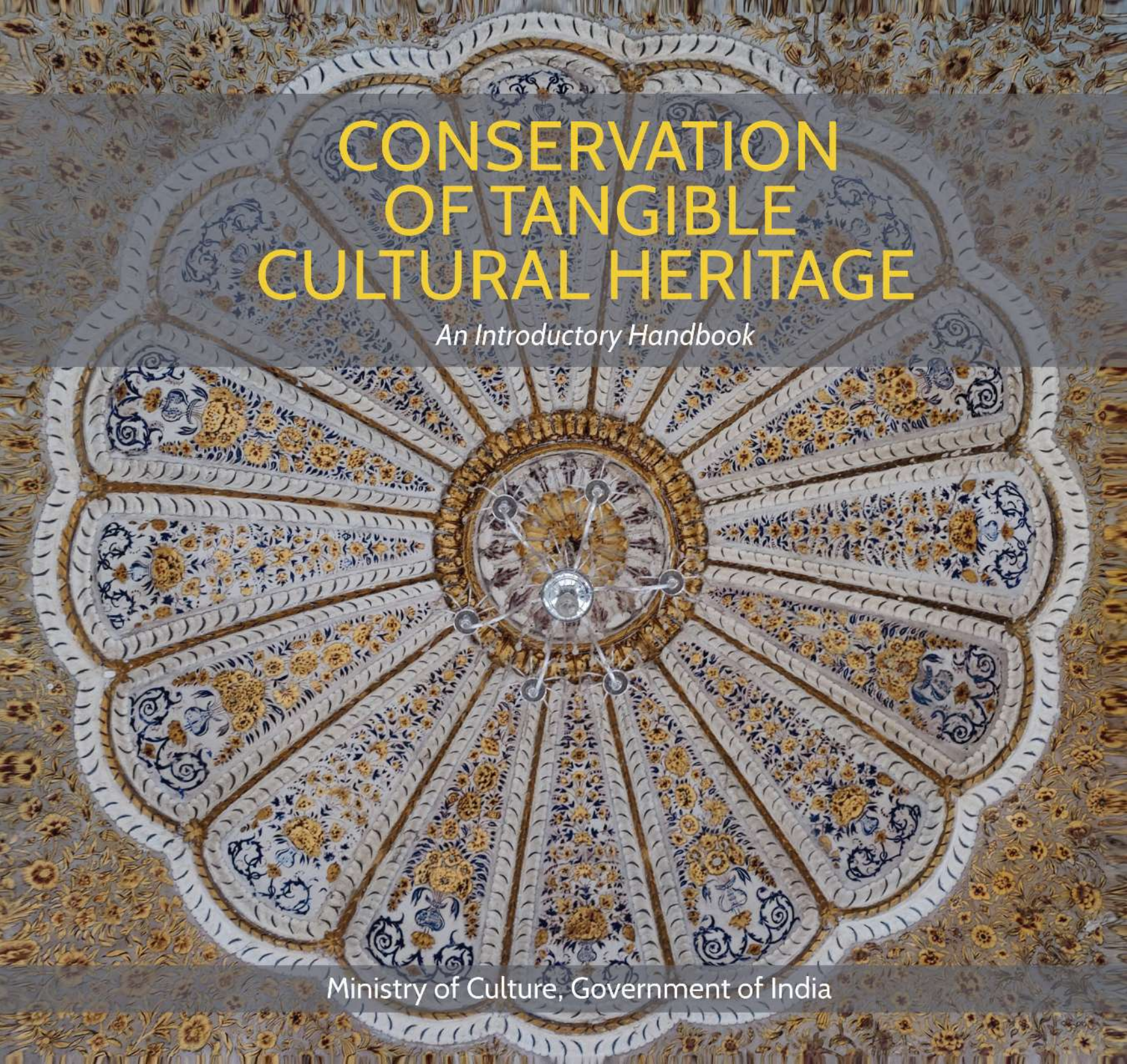

CONSERVATION OF TANGIBLE CULTURAL HERITAGE

An Introductory Handbook

Ministry of Culture, Government of India

CONSTITUTION OF INDIA

THE CONSTITUTION OF INDIA
Article 51 A (f) Fundamental Duties

It shall be the duty of every citizen of India…
to value and preserve the rich heritage of our composite culture.

भारत का संविधान

धारा 51–क (च) मूल कर्तव्य

भारत के प्रत्येक नागरिक का यह कर्तव्य होगा कि ...
वह हमारी सामासिक संस्कृति की गौरवशाली परंपरा
का महत्व समझे और उसका परिरक्षण करे।

Conservation of Tangible Cultural Heritage

An Introductory Handbook

- Anupam Sah

सत्यमेव जयते
Ministry of Culture
Government of India

International Museum Expo-2023

This book has been published on the occasion of the International Museum Expo at New Delhi from May 18-20, 2023

Conservation of Tangible Cultural Heritage – An Introductory Handbook
This book provides a brief introduction to conservation of historic, artistic and sacred works

Non-commercial.

Foreword by Smt. Mugdha Sinha
Jt. Secretary, Ministry of Culture, Government of India

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FOREWORD

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नई दिल्ली–110001
GOVERNMENT OF INDIA
MINISTRY OF CULTURE
NEW DELHI-110 001

I am delighted to present a handbook on *"Conservation of Tangible Cultural Heritage - An Introductory Handbook"* to those who are generally interested in cultural preservation, as well as those who work in, or aspire to work in, museums, which are repositories of both our tangible and intangible - cultural heritage. While most relics have found homes in museums, the majority are still left to fend for themselves.

This book will serve as a checklist for developing captive conservation labs in the museums where tangible cultural heritage is preserved. Tangible Cultural Heritage refers to physical objects created, preserved, and passed down through generations in a civilization. It comprises innovative creations, constructed heritage such as buildings and monuments, and other physical or tangible results of human ingenuity that have cultural significance in a culture.

Museum collections instil national pride and familiarise citizens with their interconnected histories, and they are some of the most powerful educators in the promotion of awareness and experience of the great Indian heritage. It is now more important than ever to reconsider the role of museums. As we celebrate the International Museum Day, on the theme of "Museums, Sustainability, and Well-Being," the Ministry of Culture is happy to present this handbook as a tool to fulfil "the Fundamental Duty of every citizen of India (under Article 51A) to value and preserve the rich heritage of the country's composite culture."

I am hopeful that this book will serve as a guide to various of museums that need preventive collection care and enable them to set up conservation labs on their Museums.

(Mugdha Sinha)
Joint Secretary
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PREFACE

Preservation of cultural heritage is an effort that harmoniously brings together the various sciences, technology, humanities, fine arts, craftsmanship, manual and technical skills into a holistic and multidisciplinary profession known as heritage and art conservation. It can also be employed as an effective lever for holistic development.

This handbook introduces the reader very briefly to the following topics: The various historic, artistic and sacred objects of the Indian subcontinent, their significance, and an introduction to the principles of preventive conservation that protects cultural heritage from deteriorating in the first place;

The materials and technology of tangible cultural heritage followed by an introduction to deterioration of art objects and preventive conservation actions and then;

An introduction to Remedial Art Conservation and Restoration, the field that treats damaged objects so they can continue to be accessed and appreciated.

The fact that objects of cultural relevance have been handed down to us by our ancestors as our heritage shows that ancient societies looked after their creations and handed them over to subsequent generations without any loss of authenticity or altering of their physical form.

In India there are numerous traditional and time-tested systems of preservation of our tangible heritage, whether it is the application of *vajra-lep* on our monuments or it is the use of traditional formulations to protect manuscripts from decay.

With this backdrop of indigenous systems of conservation of heritage, It was in 1784 that modern conservation efforts were initiated by European traders and the Asiatic Society was founded. In 1796 it was designated as a museum – for reception and preservation of objects that were important from an industrial point of view.

Various departments took care of only those collections that they deemed useful. Even within one museum, different departments took care of their individual collections – botanical, mineral etc. In 1861, Archaeological Survey of India was established. In 1917, Chemical branch of ASI was established, and in 1921 the Science branch was set up in Dehradun. In 1930, the first conservation laboratory for cultural artefacts was established at Chennai, and subsequently at the National Museum.

Today the art conservation profession has grown beyond just chemistry to a profession that has developed protocols that pay attention to ethics and philosophies that govern conservation of cultural heritage. There is intense engagement in the world for the preservation of our common human heritage.

This publication draws from the practice of art conservation the key points that govern the conservation of our tangible heritage. Once the longevity of the physical form of our cultural artefacts is ensured, then we can showcase them to share the knowledge, essence and intangible richness of our cultural heritage.

-Anupam Sah
Art Conservator-Restorer

SIGNIFICANCE OF ART OBJECTS

Human beings have created objects for their utility, display, rituals, education, celebration and as carriers of human expression and for many other purposes. Human creativity and efforts are expressed in these works that can be termed as historic, artistic or sacred. In Oriental thought, creation of a sacred work of art is considered to be also a path for spiritual growth.

The creation of a work of art is not just an individual effort, but also involves various members of diverse communities and practices and involves a variety of materials, indigenous techniques and technologies, as well as contemporary advances in products and facilities. They are an indicator of the development of society, knowledge and skills, environmental situation, as well as economic strength. These are physical manifestations of human progress over millennia
carrying time-tested and continually improved practices.

While these objects have physical form, they are imbued with intangible qualities that appeal in different ways to different groups of people.

An acknowledgement of the significance of these historic, artistic and sacred creations is the very first step in their preservation as well as ensuring that they continue to thrive as living traditions thus adding value to the cultural fabric of this land.

It is therefore important that we consciously develop a culture of respecting, conserving, and learning from our tangible heritage.

On this 75th year of India's independence,
we reiterate Article 51 A (f) of The Constitution of India...

Fundamental duties .....
It shall be the duty of every citizen of India
to value and preserve the rich heritage of our composite culture.

PREVENTIVE CONSERVATION STRATEGY

The seven-step strategy

Preventive Conservation is any action, direct or indirect, aimed at reducing future risks of deterioration

A simple step wise approach that was articulated by Gaël de Guichen and the ICCROM team in 1995 is still relevant today:

1.Know your collection – its materials, condition, significance, art history etc

2.Identify the factors of deterioration or risks to the collection – such as climate change, humidity, insects, fungus, human inaction, wrong action or vandalism, inherent decay, and disasters.

3.Avoid the risks – eg. situate the collection in a place where the causes of decay are absent, or avoid action that could prove harmful.

4.Monitor the risks- Instruments that measure humidity, temperature, light, volatile organic compounds, carbon dioxide and dust levels are easy to handle.

5.Block the risks- Once monitored, then block them and monitor risk levels again.

6.Take action- If we cannot avoid or block these factors of deterioration, then we must take physical action, for example – keep manuscripts bound tightly in their wooden covers, wrapped in clean cotton cloth, and kept in a good quality box or chamber; or, switch off lights when the displayed objects are not being seen by visitors.

7.Communicate- We must create awareness of the significance of our heritage, share successes and challenges of our efforts, write to governing authorities and professional colleagues.

HISTORIC, ARTISTIC AND SACRED WORKS IN THE INDIAN SUBCONTINENT

Some of the common materials with which works of art have been created since millennia in the Indian subcontinent have been clay, plant fibres, mineral and earth pigments, stucco, terracotta, wood, stone, cloth, metal alloys, glass, ceramic, paper, minerals, and now modern materials. These have been fashioned into as many types of objects as the cultural leanings and skills of the people that enrich this land.

The next few pages showcase some of these works. Before we can take a decision on how to preserve an object, we need to understand how it is created and how it deteriorates.


Rock Art and Petroglyphs

ROCK ART AND PETROGLYPHS

Rock Art is our First Cultural Heritage and truly a *prasaad* from our prehistoric ancestors and connects us to them. It is our good fortune some of it still remains to be seen today, as much has already been lost. Rock Art is very vulnerable and highly at risk of disappearing forever. Because it is so old, it is one of the earliest memories of human progress and connects all of humankind together.

Rock art is designs made on the rock surfaces including caves and rock shelters. They have been found to be even older than 10,000 years and were made using tools and earth colours such as yellow and red ochre, that were sourced from the surrounding environment.

Bhimbetka is one of the largest rock art complexes in India with more than a hundred rock shelters. There are numerous sites in various States of India.

Petroglyphs are engravings on stone surfaces such as can be seen in in Ratnagiri in Maharashtra, and in the Spiti valley in Himachal Pradesh.

Rock Art has to be preserved together with the landscape it is situated in, and with the indigenous people who inhabit the area.

The world's Rock Art could well be a symbolic reflection of the Sanskrit phrase, *Vasudhaiva Kutumbakam* – the world is one single family.


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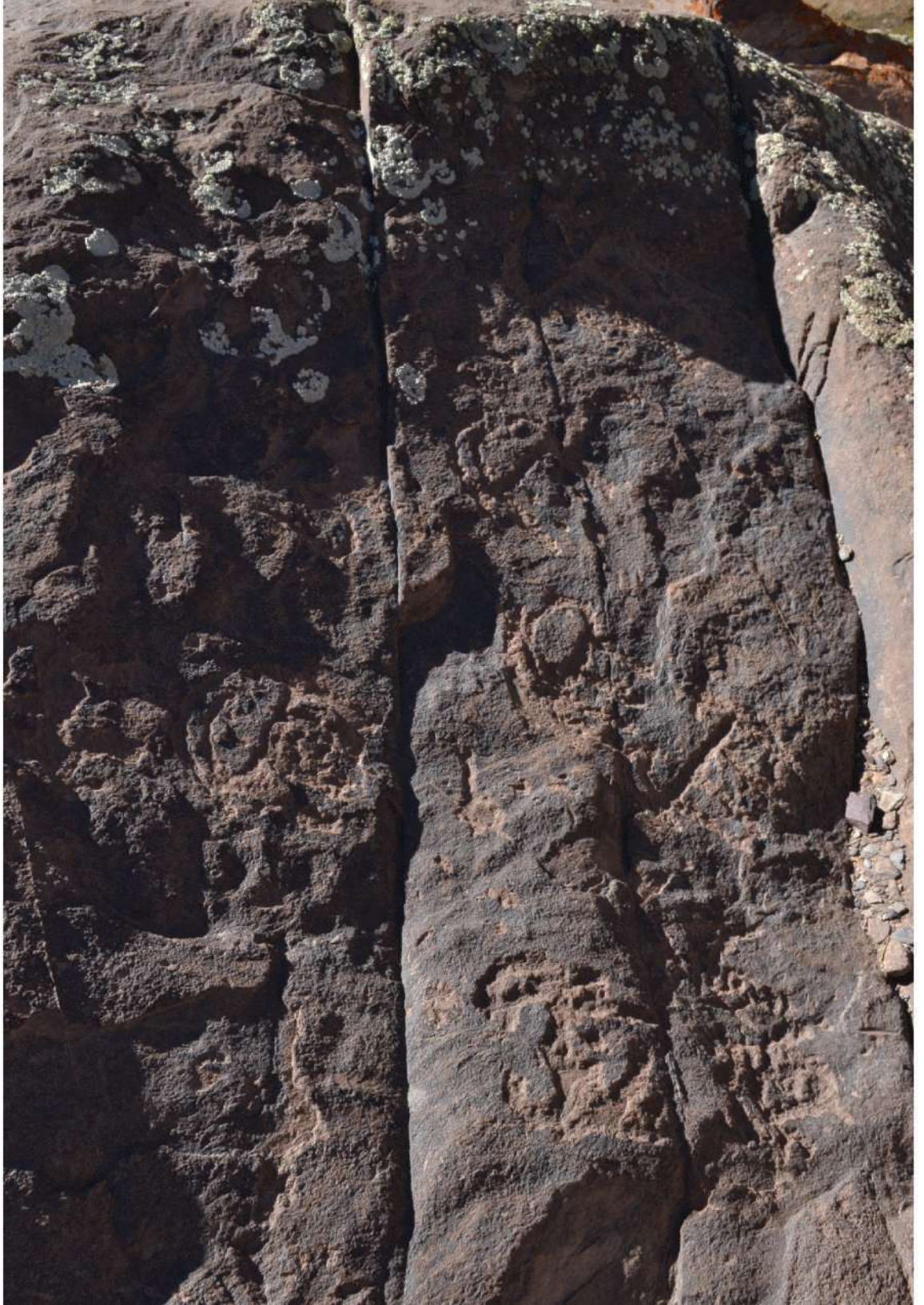
IFRAO



DETERIORATION of Rock Art and Petroglyphs

Rock Art of India is highly vulnerable as it is situated in far flung areas where construction, agriculture, and mining have now become common and with lack of controls, absence of monitoring, and vested interests compounded with insensitivity, this oldest of human heritage may be lost forever, severing our link with our ancestors who once first inhabited this land.

Other than pressures of development, physical interventions by unauthorised researchers, graffiti by unruly visitors, erosion by people walking on petroglyphs, fires on the grass and vegetation, water damage, use of concrete and other carelessly planned tourism infrastructure compound and speed up the natural degradation of these sites, only a few of which are formally protected. Incorrect and sensational interpretation by guides degrades its value too.

PREVENTIVE CONSERVATION of Rock Art sites

There are some protected sites, but there are many for which the the local, administrative and political will need to be mobilised in order to preserve them.

As the monetary value of land and its resources rise, rock art sites become even more vulnerable to exploitation. Rock art sites need to be showcased in a responsible manner, and their socio-economic-cultural value needs to be demonstrated by creating pilot projects with local community involvement.

Local archaeology colleges, national, state, parastatal and urban local bodies must be empowered to document this unique physical, natural and intangible heritage of India and of the world, and create a sound management plan for their preservation and employment for the greater good of all.

Clay, Stucco and Terracotta

CLAY, STUCCO AND TERRACOTTA

Clay is made up of very fine particles of soil that have a sheet-like structure that slip over each other when wet, and become very hard when dry. Wet clay is moulded to make figurines and also bricks for large buildings such as the thousand-year-old monasteries one can see in Ladakh.

Stucco has been used for more than a thousand years to make statues and decorations on buildings. It is made of lime mixed with stone particles and plant fibres.

The word **terracotta** means cooked or baked earth. Clay is moulded into objects and utensils and then fired in kilns. Terracotta is a very stable material and is therefore found in excavation sites under the sea and under the earth where it has laid buried for millennia.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DETERIORATION of Clay, Stucco and Terracotta

While clay, stucco and terracotta can naturally last for centuries in ideal conditions if they are not disturbed, their greatest risk comes from physical damage.

These objects need to be protected from water. For example, monasteries made of the local clay called *markalak* in the higher reaches of the Himalaya, which have stood for more than a thousand years, are developing cracks and leakages due to heavy rainfall in these times of climate change.

Terracotta objects are sometimes excavated without buffering them against moisture changes, and if there are no trained art conservators or preventive conservation guidelines on handling, packing, transport, storage, salt removal or stabilisation treatment, they break apart, get stained, or are damaged due to improper repairs.

PREVENTIVE CONSERVATION of Clay, Stucco and Terracotta

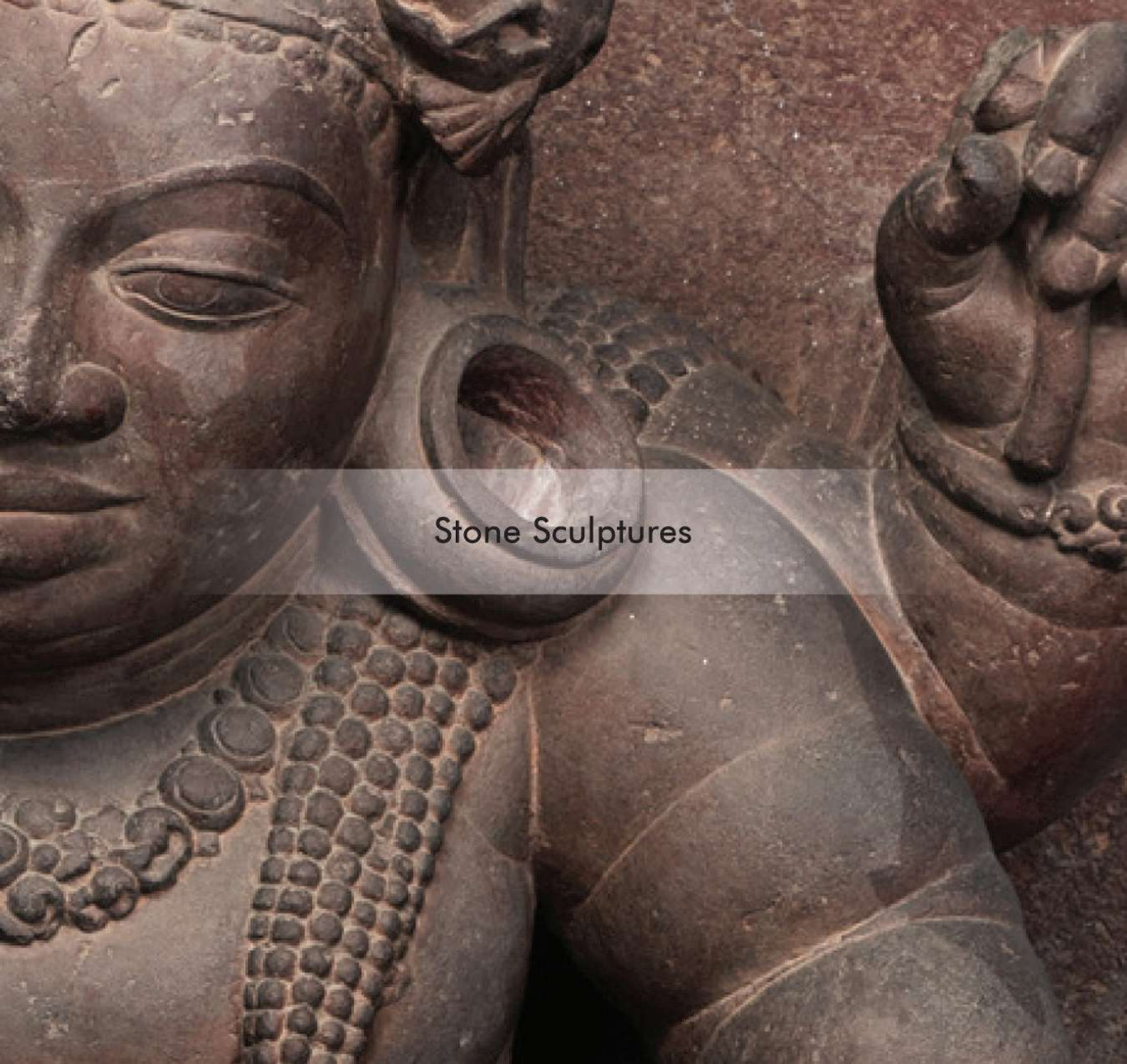
During excavations these objects must be buffered against moisture changes by managing their moisture content and wrapping them in layers of well washed cloth and storing in well cushioned boxes.

Pieces often get lost and must be numbered, and stored without loading them one on top of the other. Protect them from dust.

During transport in trolleys or vehicles, and in storage, they must be placed on proper supports, individually wrapped and cushioned so they do not move or come in contact with each other.

In case salt formation is seen on the surface, do not brush it, but consult an art conservator immediately. Avoid washing these objects with water.

Consult a conservator on how to use reversible materials when joining fragments.


Stone Sculptures

STONE SCULPTURES

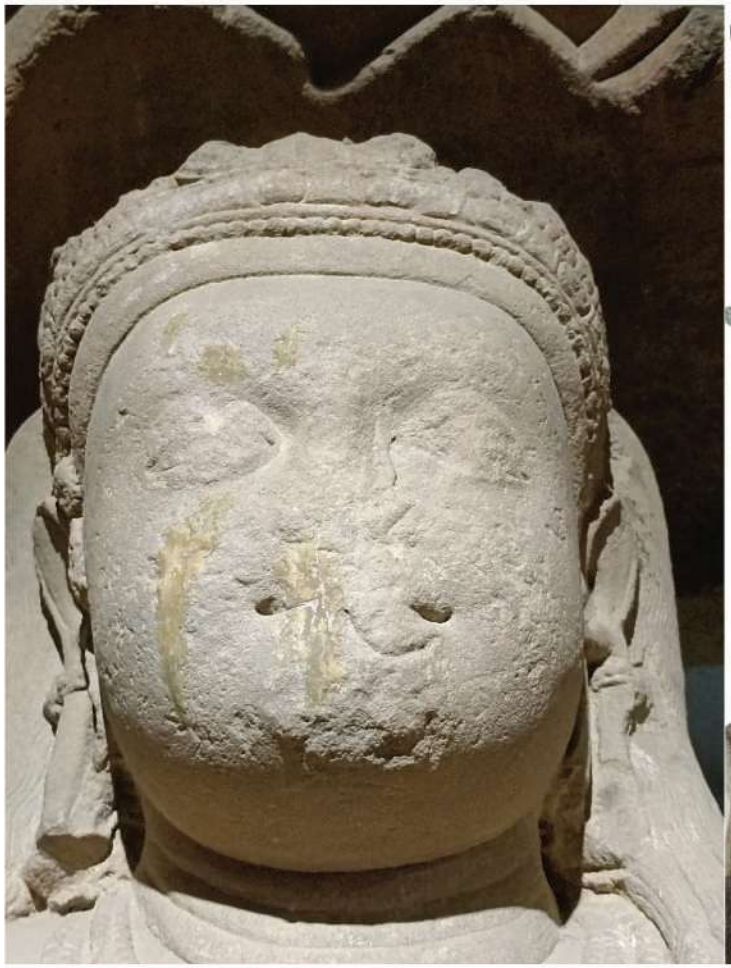
A variety of rocks are fashioned into sculptures.These include sedimentary rocks such as limestone and sandstone; igneous rocks such as granite and basalt; and metamorphic rocks such as gneiss and schist.

Many of these stone sculptures are individual objects, or as part of a composition, and often they are an element in a built structure or rock cut architecture.

The is a huge variety of stone sculptures in India both in terms of scale, as well as of technical skill by which they were sculpted.

We must keep in mind that most sculptures in our collections are those that have been removed from sites and therefore their context must also be explained when being displayed or being conserved.


National Museum



DETERIORATION of Stone sculptures

Stone can suffer from mechanical and biological, damage, weathering and surface deposits. Indiscriminate repairs with cement and seepage of water can severely damage stone due to salt crystals forcing their way out of the stone (efflorescence). This also causes thin layers of stone to peel off like onion skin. Dark crusts and accretions form on surfaces, as do stains of various types.

The surface of stones gets abraded, weathered, and crumbles causing loss of surface details. Fractures that cause failure of the stone form due to the nature of the stone or due to the rusting of iron insertions during construction or repair of the sculptures and structures.

Due to biological action or rough cleaning action, holes form on stone surfaces (pitting), stones may get discoloured and plants may pry open the cracks.

PREVENTIVE CONSERVATION of Stone sculptures

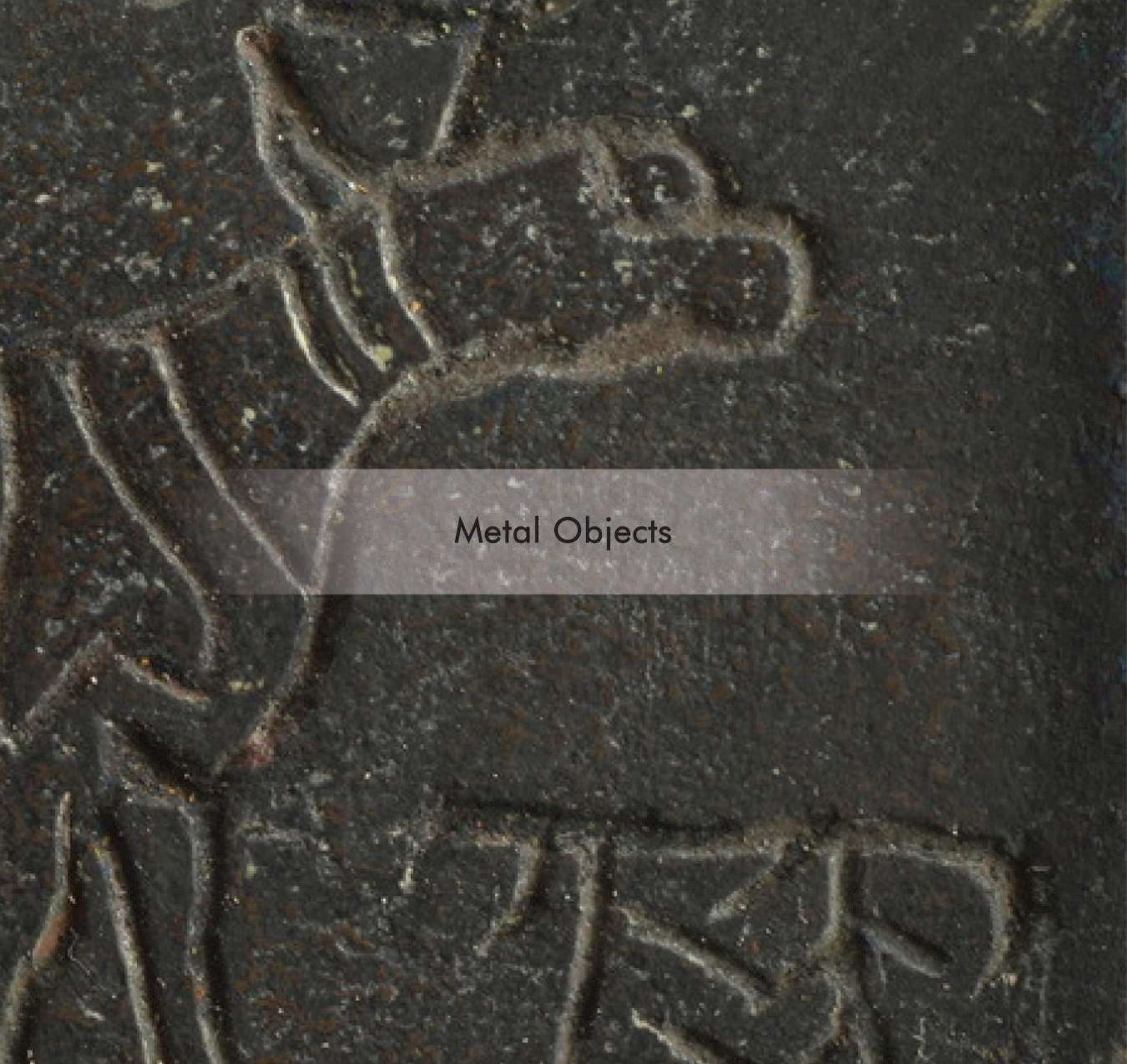
The sculptors must select stone free from inherent defects, and align the stone according to its bedding plane.

Stone sculptures must be protected from water and any sources of seepage or rising damp must be blocked. They must not be scrubbed with hard materials nor cleaned with high pressure water jets or abrasives.

Cement should not be used to repair damages in stone or to fix them on walls and pedestals for display in museums. Avoid iron insertions to support stone sculptures.

Consult a stone conservator to remove stains and surface accretions or metal insertions, to remove salts, or consolidate and stabilise exfoliation of the surface.

Protect stone sculptures from high winds or rain, extreme climate and dust.



Metal Objects

METAL OBJECTS

India has had a very strong and ancient tradition of metallurgy as can be seen in the forging prowess evidenced in the famous iron pillar, the creation and export of wootz steel technology, and the world's earliest production of zinc, among others.

India's heritage in metal comprises of exquisite sculptures and objects in alloys of copper, zinc, tin, lead, iron and steel, gold and silver created using various techniques such as punching, repousse, chasing, engraving, metal encrustation (*Tanjore Swami* work), *bidri, kuftgari, tarkashi,* gold amalgam gilding, etc.

Extensive and rich local vocabulary related to metallic ores, metallurgy and artistic production exists in the various regions of India and needs to be documented and preserved just as much as the objects in our collections and institutions.

DETERIORATION of Metal objects

The seeds of deterioration of metal objects can be found in the choice of raw material, its fashioning into the objects, and their use and storage in humid and polluted environments.

Active rusting of iron results in an orangish colour that turns brown later. Lead objects, coins, can disintegrate to whitish gray powder, and tin to a grey one. Silver tarnishes. Aluminium can develop a white crust. There can be blistering and pitting on the surface of metals.

Copper alloy objects have corrosion products that are commonly greenish in colour, and the light green powder that we see as pinhead sized spots on this metal is indicative of a dangerously active corrosion called copper disease. When different metals are in contact with each other, much faster galvanic corrosion takes place.

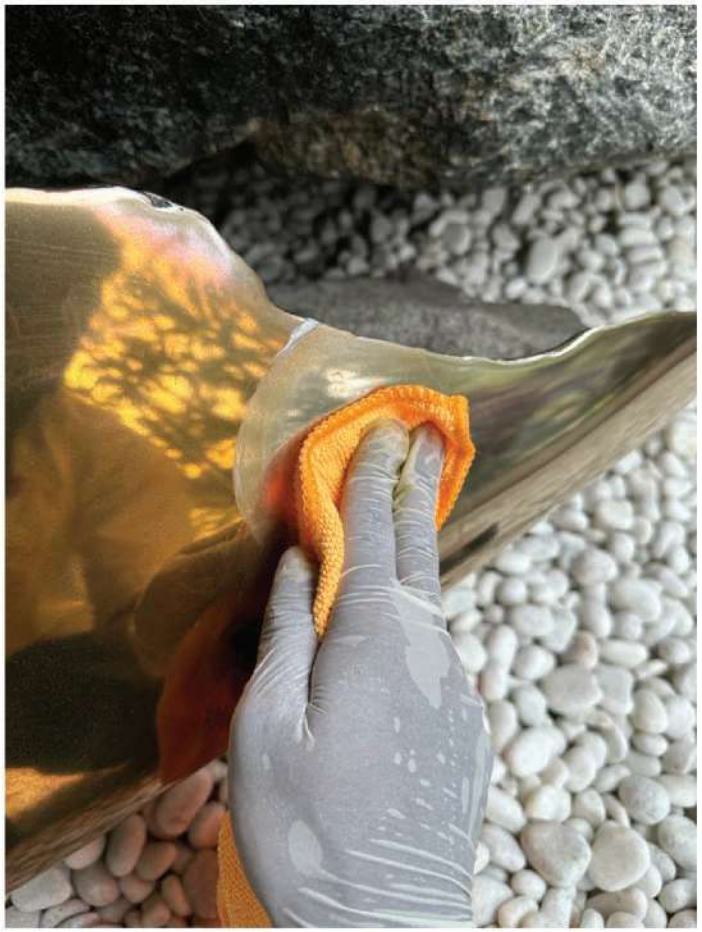
PREVENTIVE CONSERVATION of metal objects

Perhaps the biggest enemy of metallic objects is humidity, and objects should be kept in a dry and non-polluted environment with good air circulation.

Avoid cardboard, plywood or wooden boxes for storage as they release VOCs (volatile organic compounds) including acids and sulphur.

Do not keep metal objects in direct contact with other metallic surfaces or objects. Keep them in separate polythene bags.

Wear nitrile (often sold as purple colour gloves in chemists stores) or cotton gloves when handling metal objects as salts from finger tips can stain the surfaces. Do not scrape objects to clean them as protective oxide layers on metal surfaces may be lost, leading to further damage.




Wooden Objects

WOODEN OBJECTS

Wood has been one of the most preferred materials and wonderful for the environment when used in a selective and sustainable manner. Wood locks carbon from the atmosphere and its fashioning into art objects or structures by hand leaves behind a negligible carbon footprint.

The traditional wooden architecture of India is impressive not just for the quality of understanding of the material, or for the technical skills that the vernacular wood workers had, but also for the quality of workmanship.

Wood is categorised into hard or soft wood based on size of its pores, not on their softness. Wood responds to changes in the environment and expands and contracts and bends in different directions (anisotropy). Wooden objects are often painted over after pasting a cloth support over them.

DETERIORATION of Wooden objects

Wood if it is not seasoned properly starts warping and bending. Cracks form on it and it can split and break. In the open wood weathers and discolours.

Wood is relatively soft and gets physically damaged easily. Such wood also catches fungus and starts rotting and getting soft and then insects attack it too eating it up until sometimes only a thin wooden shell remains.

Wood is fabricated into sculptures and structures and the joinery may fail, or the inserted nails may cause cracks and splits. Paints and other impermeable coatings on wood often fail and may sometimes increase the rate of decay.

Waterlogging of wood can make the wood spongy and may cause it to crumble if dried in an uncontrolled manner.

PREVENTIVE CONSERVATION of wooden objects

Wood should be handled gently and away from hard materials. Fluctuations in temperature and relative humidity should be kept to a minimum by wrapping small wooden artefacts in layers of clean cotton cloth. Check for fungus growth, and keep RH less than 65%.

Keep indoor wooden objects away from sources of heat as the chemical bonds of the wooden fibres weaken due to heat and even more in the presence of moisture. Keep wood in non-acidic environments and avoid direct sunlight.

Presence of fine powder (frass) or pin-sized holes (fight holes), indicate a chance of active insect attack. Regular inspection is the key to preventive conservation.

Do not store in cardboard or plywood as they release acidic vapours. Care for wooden painted surfaces is explained in the following sections.


Pigments and Binders

PIGMENTS AND BINDERS

Most of the painted surfaces in India, since ancient times, were prepared with earth (E) and mineral (M) pigments mixed with a plant gum as a binder. While there are many pigments, some of the most common pigments have been:

Red

Red ochre, *geru* (Earth)

Cinnabar, *hingula* (M)

Red lead, *sindoor* (M)

Blue

Lapis Lazuli, *rajavarta* (M)

Indigo, *neel* (It is actually a dye that is precipitated on a white substrate as a pseudo pigment)

Black

Carbon black , *kajal*, is prepared from soot of oil lamps.

Green

Verdigris, *janghal* (It is one of the oldest manufactured pigments prepared by dipping copper in vinegar)

Yellow

Orpiment, *haritala* (M)

Indian Yellow, *gougoli* or *peori*

Yellow ochre, *peeli maati* (E)

White

Conch shell white, *dhaula*

Lead white, (M)

Zinc white, (M)

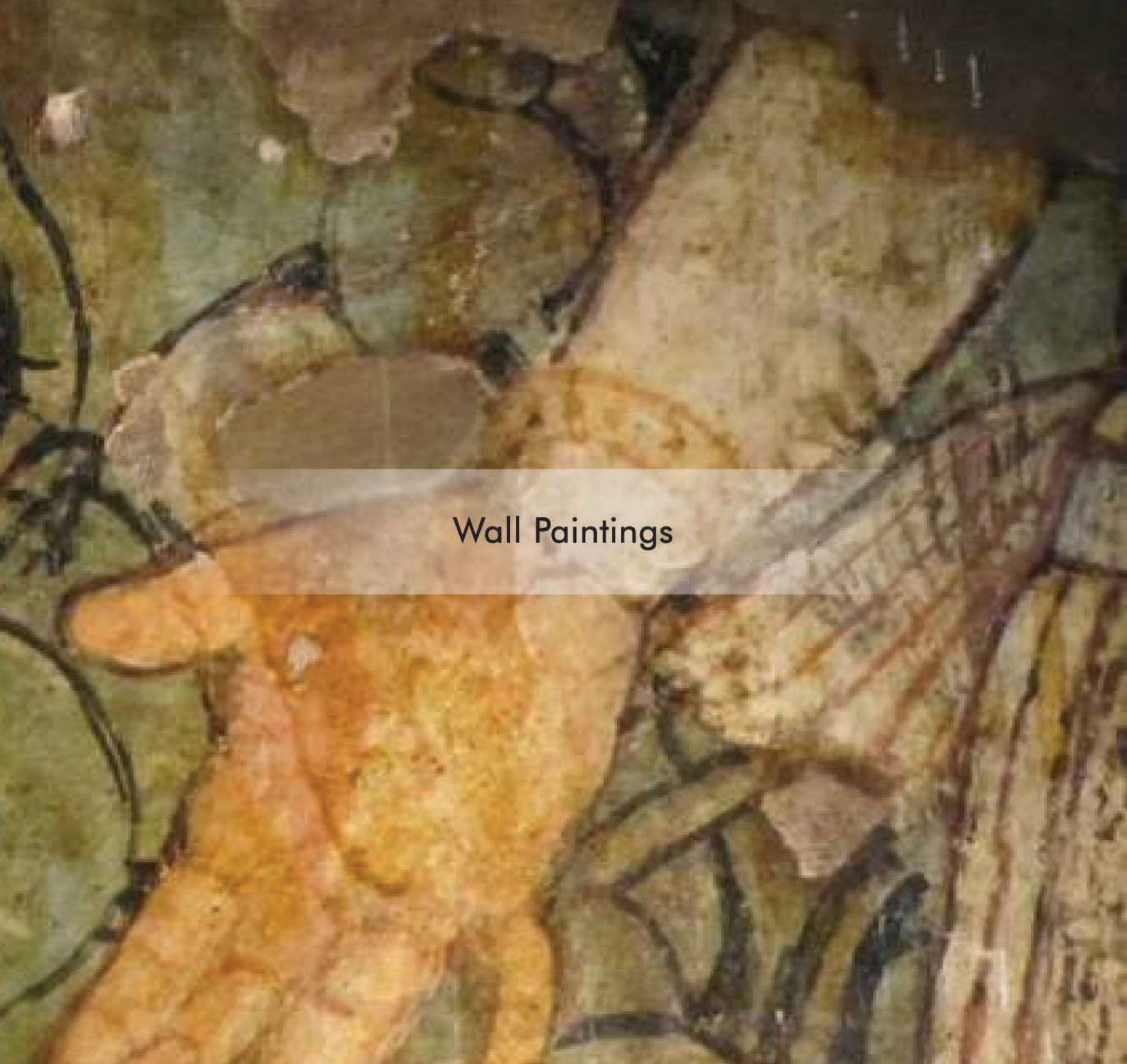
Binders

Pigments have to be mixed with plant gums or diluted animal glues (and today with synthetic adhesives) in order to create paints that are usually applied with brushes to colour objects.









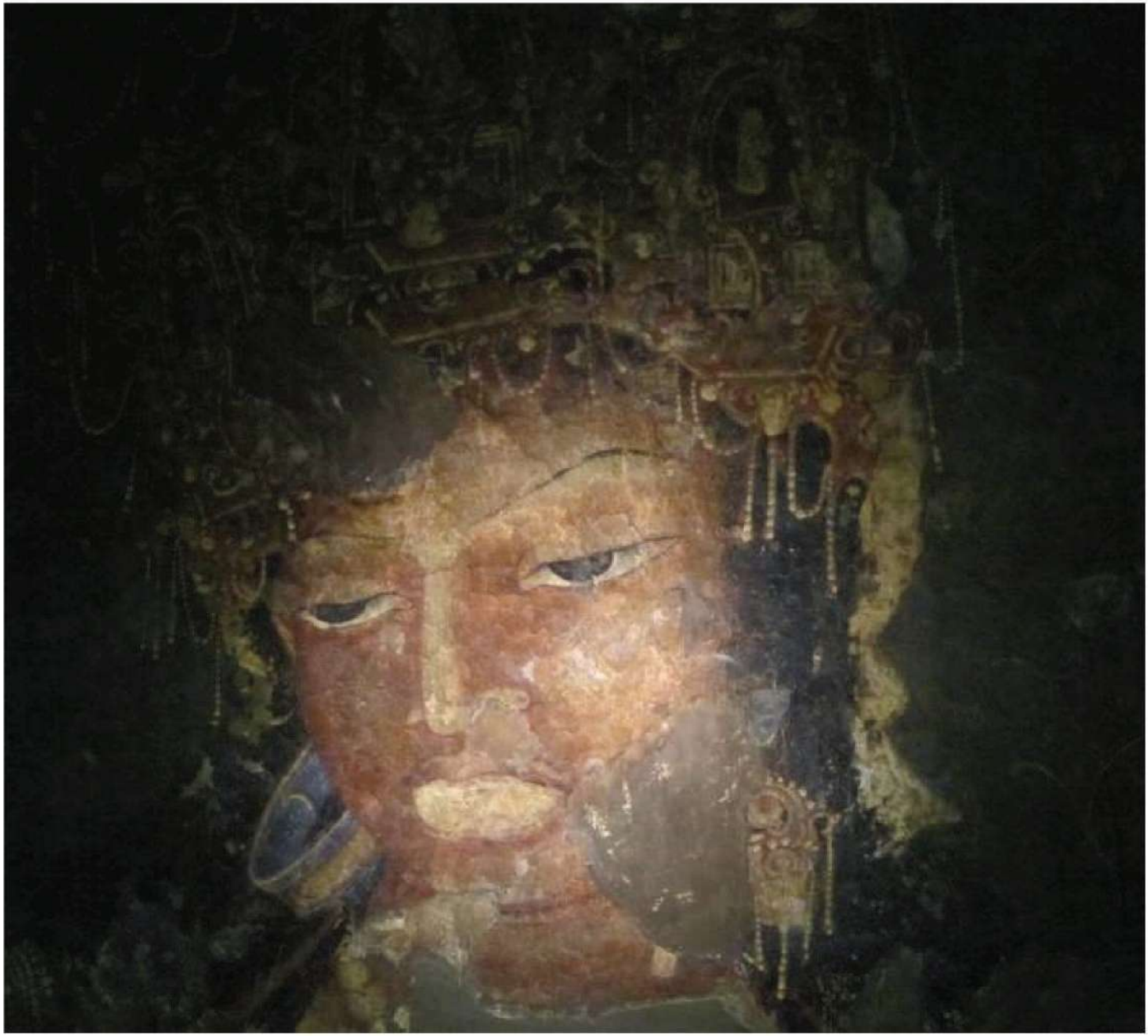
Wall Paintings

WALL PAINTINGS

Amongst the world's oldest and largest wall paintings sites is the 2000-year-old rock cut cave complex, a world heritage site, near the village of Ajintha in Maharashtra. These paintings are known as the Ajanta murals, and they are not frescoes.

Exquisite wall paintings dot temples, churches, seminaries, monasteries, mausoleums, gurudwaras, havelis, palaces, and buildings in almost every State of India. Over centuries, every region of India has developed its unique plaster and painting technique and style.

Some are painted on plasters made of sand, gravel, husk, mixed in clay, or lime, while some are painted on cloth stuck on walls. Artists create designs on the prepared walls and then paint them with pigments mixed with plant gum or animal glue, and in some techniques, such as *araish*, even burnish the plastered wall to create a lustre.



DETERIORATION of wall paintings

As wall paintings are created on the walls and ceilings, if the building structure or roof is weakened, then the paintings will deteriorate very quickly, and also when the plasters on which the paintings were created separate from the wall, or crumble and fall.

Often a careless custodian may direct contractors to fix electrical fittings on the paintings. remove the painted plasters, whitewash or paint over them.

Insect attack, bat droppings, water seepage plays a major role in damaging wall paintings as it stains the murals, causes salts to damage the plasters, encourage microbiological growth, and also cause flaking and loss of paint.

Well-meaning but badly executed repairs by untrained persons, as well as uncontrolled visitor movement damage the works, sometimes beyond repair.

PREVENTIVE CONSERVATION of wall paintings

The roof of buildings that have wall paintings should be waterproof, the water drainpipes should be clear, and the hollows and cracks on the painted plasters should be monitored. All paintings should be photographed and a record maintained.

Custodians of wall paintings should be aware of the significance of the wall paintings under their charge. They must instruct building contractors, masons, and painters to not place any fixtures and fittings on the painted walls.

Avoid sharp fluctuations in relative humidity and temperature. Entry of visitors to be controlled and vandalism checked. Consult a conservator before any repairs are done, or if any damage to the plaster is noticed. If paint is flaking, do not brush it off. Do not paint over faded images before consulting.

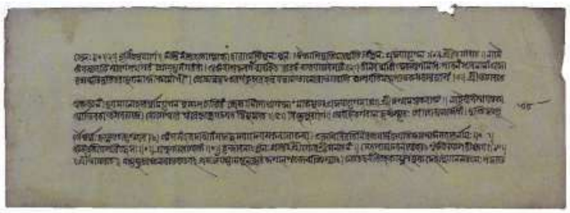
Manuscripts and Archival Documents

MANUSCRIPTS AND ARCHIVAL DOCUMENTS

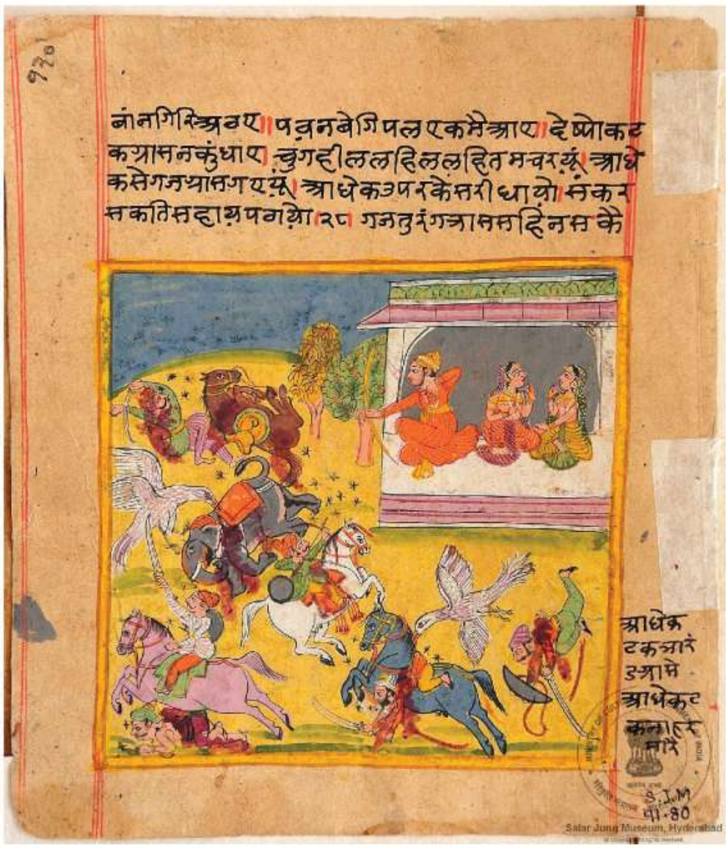
In the classical sense, the term manuscript refers to a handwritten document. There are a variety of writing supports such as palm leaf or *tal patra* on which the letters are incised with a metal stylus or *lekhani*, and then rendered visible by rubbing an ink into the engraved writing.

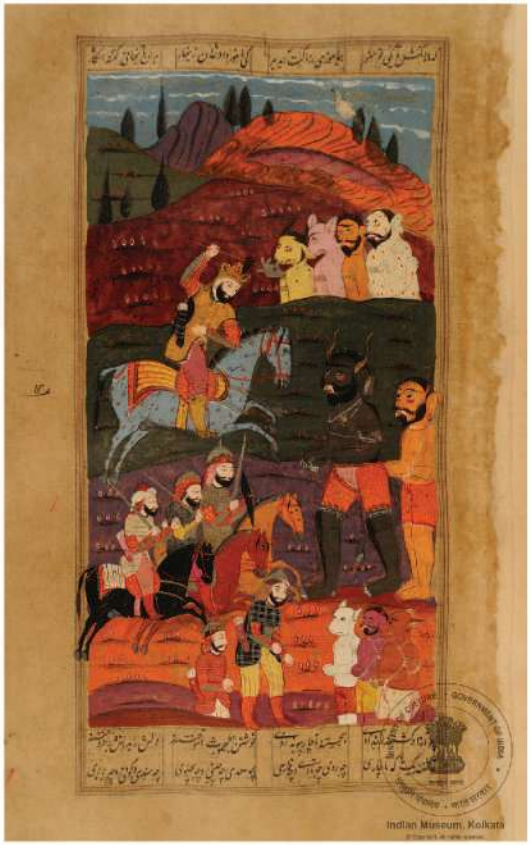
In the Himalaya, birch bark or *bhoja-patra* was employed as a writing support and the text was written on the surface with ink. In Assam, the bast of the *Agaru* tree was treated and used as a support for writing and is known as *haansi-paat*.

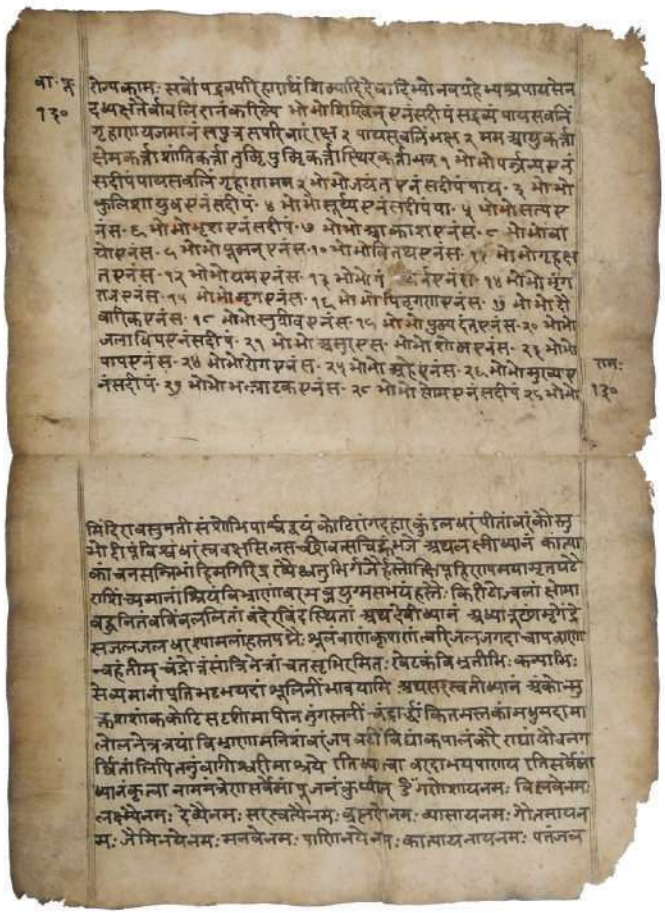
A variety of paper was created with cellulose rich plant fibres in various parts of India. With the advent of manufactured paper as an industrial product, administrative information and events were noted on paper and stored in archives for records and reference.




Salar Jung Museum, Hyderabad




Indian Museum, Kolkata



DETERIORATION of manuscripts and archival documents

Due to the organic nature of the plant fibres that make up manuscripts, the material deteriorates with time. With the action of light and the environment, it turns acidic and embrittles, losing its flexibility, and fragments.

In high humidity manuscripts can be colonised by mold and fungus that stain and weaken them. Rodents and the larvae of Insects can eat away entire collections of documents.

There are reasons inherent in the modern paper manufacturing process that also cause modern paper to deteriorate very fast, for example, the acidic materials used to prepare the paper, the corrosive nature of the inks and adhesives used in the binding.

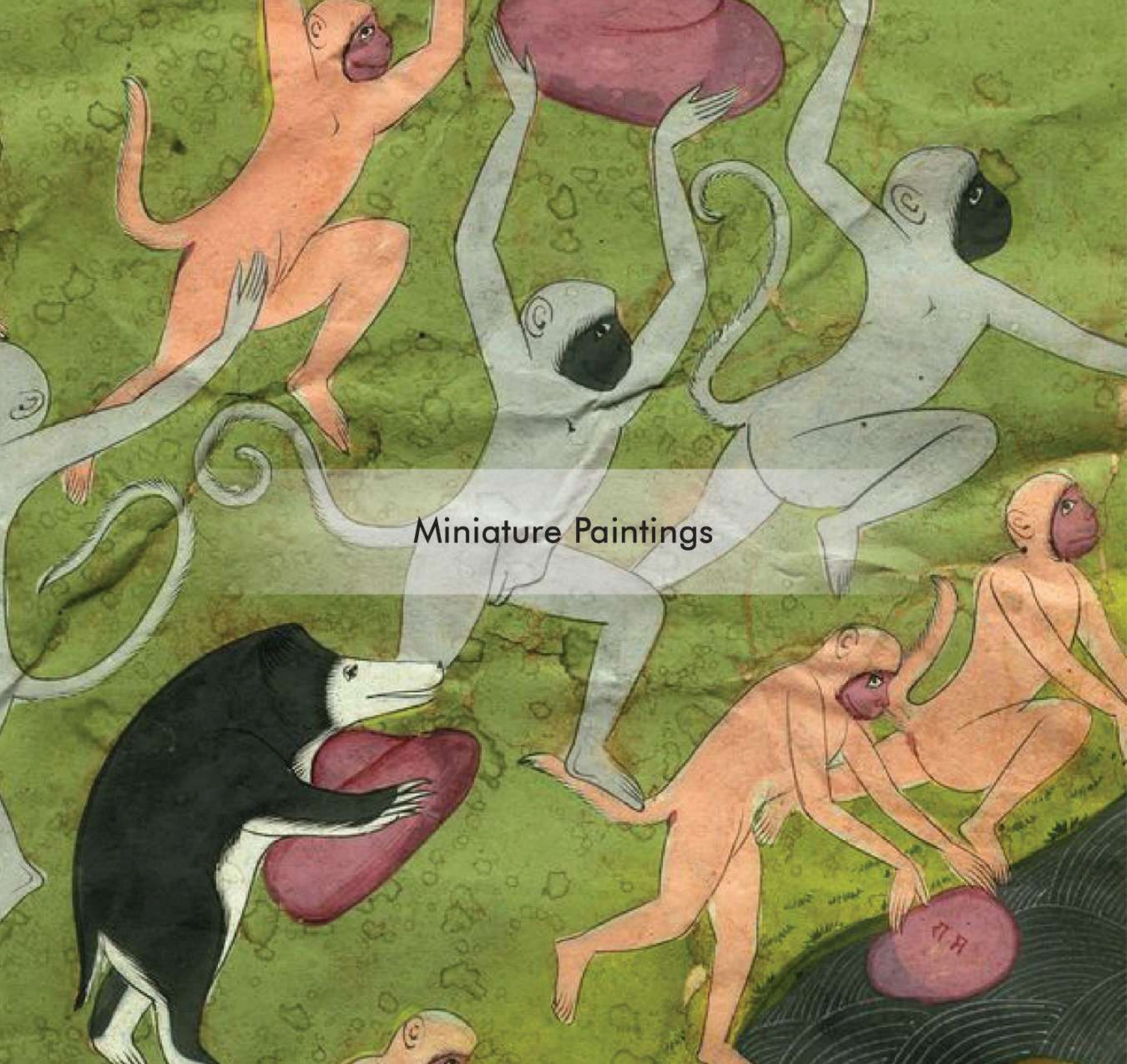
Vandalism, fire and water disasters can destroy entire collections in a short span of time.

PREVENTIVE CONSERVATION of manuscripts and archival documents

The first step is to regularly inspect them for any fungus growth or insects, and gently brush any dust or debris from them. Keep them in their traditional book binding or between their wooden covers, wrap them in well washed, clean, starch-free cotton cloth, and place in a good quality box. Fragile folios may be kept in polyester sleeves.

Manuscripts should be stored in a dry environment. Avoid sharp fluctuations in relative humidity and temperature. Written disaster management and preventive conservation guidelines provide direction.

Digitisation has become a tool to allow researchers to handle a copy rather than original manuscripts or documents. Staff should be trained both in preventive as well as in remedial conservation processes.


Miniature Paintings

MINIATURE PAINTINGS

India has a long tradition of painting with plant gum as a binder on paper and other supports, using earth and mineral pigments. The paintings on palm leaf, paper, mica, ivory etc are what we refer to as miniature paintings nowadays.

Often layers of handmade paper were pasted with starch, coated with a ground of chalk that was burnished to a smooth finish, drawings were made on it and then it was painted with fine brushes. In many paintings, elaborate borders were created separately and then pasted. Many of these painted images are accompanied with text.

Styles and schools of painting are as many as the main regions of India, and include styles from Assam, Manipur, Pala school of Bengal, Odisha, Indo-Gangetic belt, Gujarati, Malwa, Rajasthani, Pahadi, Mughal, Deccani, and styles from Tanjore, Karanataka and other areas.


The Allahabad Museum


74.63


62-72


61-101

DETERIORATION of miniature paintings

Most of the damages on manuscripts are also common to miniature paintings. Other than these, the support can suffer from physical losses and separation of the layers of handmade paper. The movement of the paper support due to changes in humidity or improper handling can cause the paint layer to flake, leading to losses.

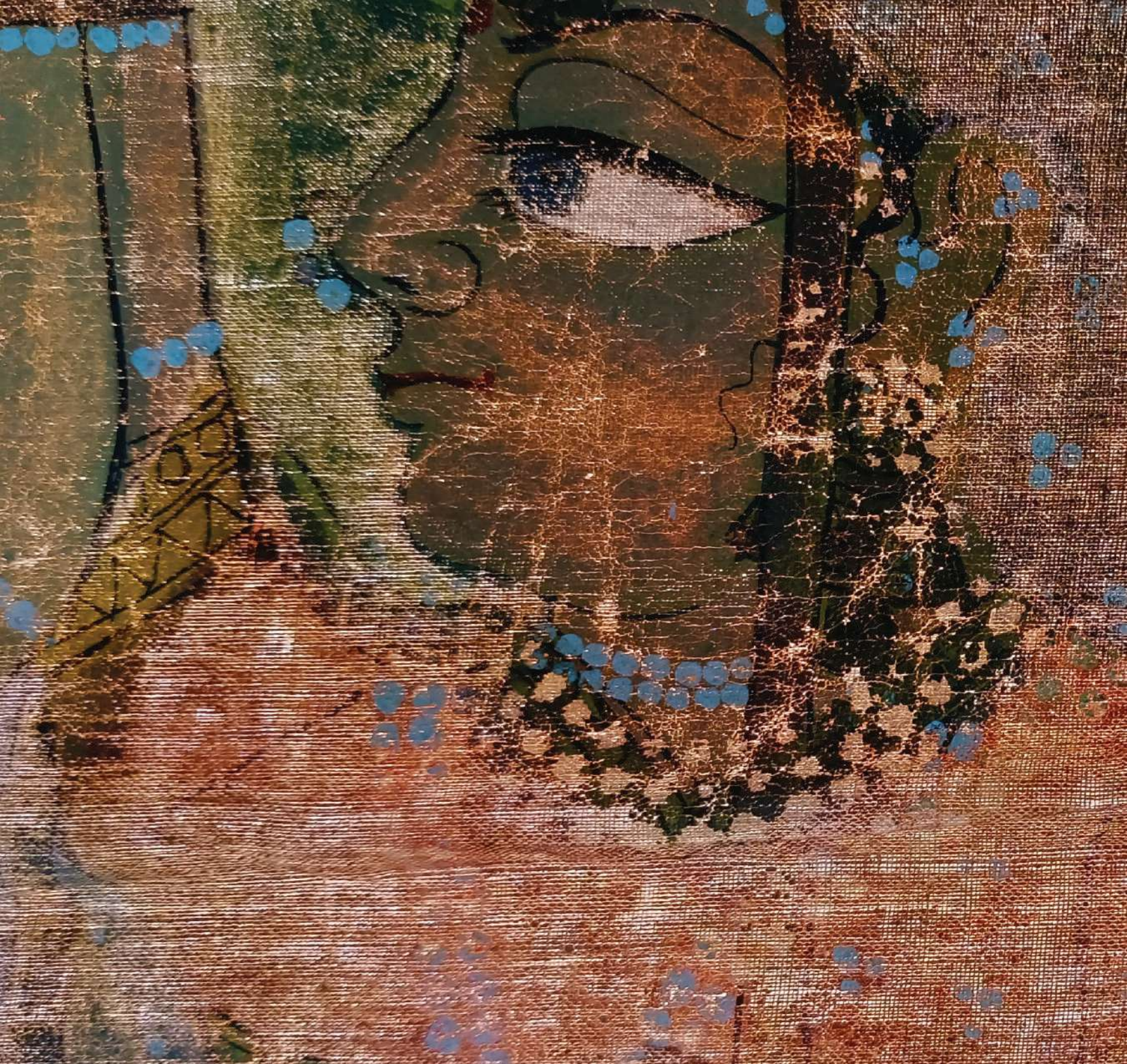
Biological growth can colonise the painting and cause staining if not treated in time. Atmospheric pollution can lead to chemical changes in the paint causing the colours to alter. Moisture damage can cause tide marks and also bleeding of the paint. Uncontrolled drying of the object can lead to cockling, as can improper repairs especially along the edges of the painting. Inappropriate conservation and bad mounting and display techniques can cause long term harm to the paintings.

PREVENTIVE CONSERVATION of Miniature Paintings

Miniature paintings should be stored in a dust free environment just like manuscripts. In addition, they must be well supported at the back and their image should be protected with thick window-cut mounts. The painted surface should be protected with good quality soft paper, and should be kept flat in small stacks with minimal pressure.

In polluted environments they should be displayed behind glass glazing or stored in boxes between polyester sleeves. Any active flaking should be immediately consolidated and mould growth must be removed during regular inspections.

In some paintings where the green pigment Verdigris or *janghal* has charred the paper, that area should be reinforced from the back to prevent loss of the painting.



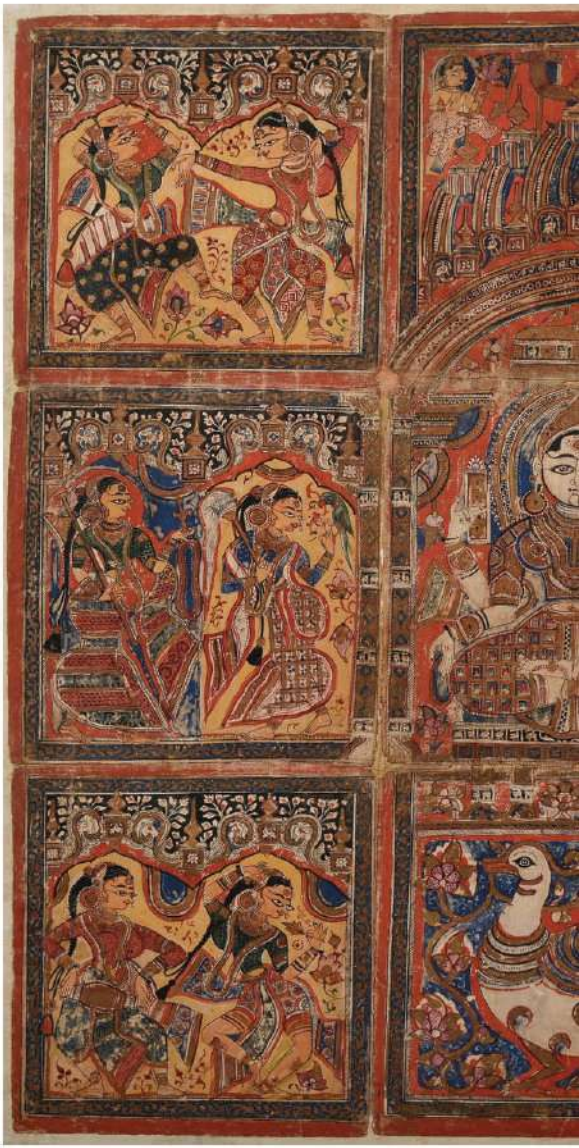

Paintings on cloth

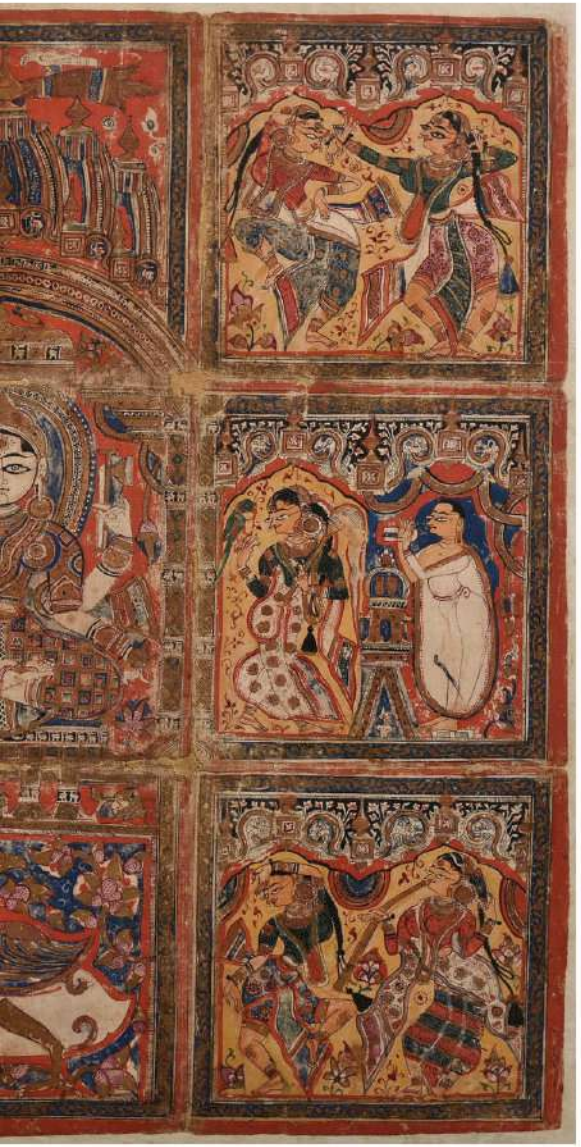
PAINTINGS ON CLOTH

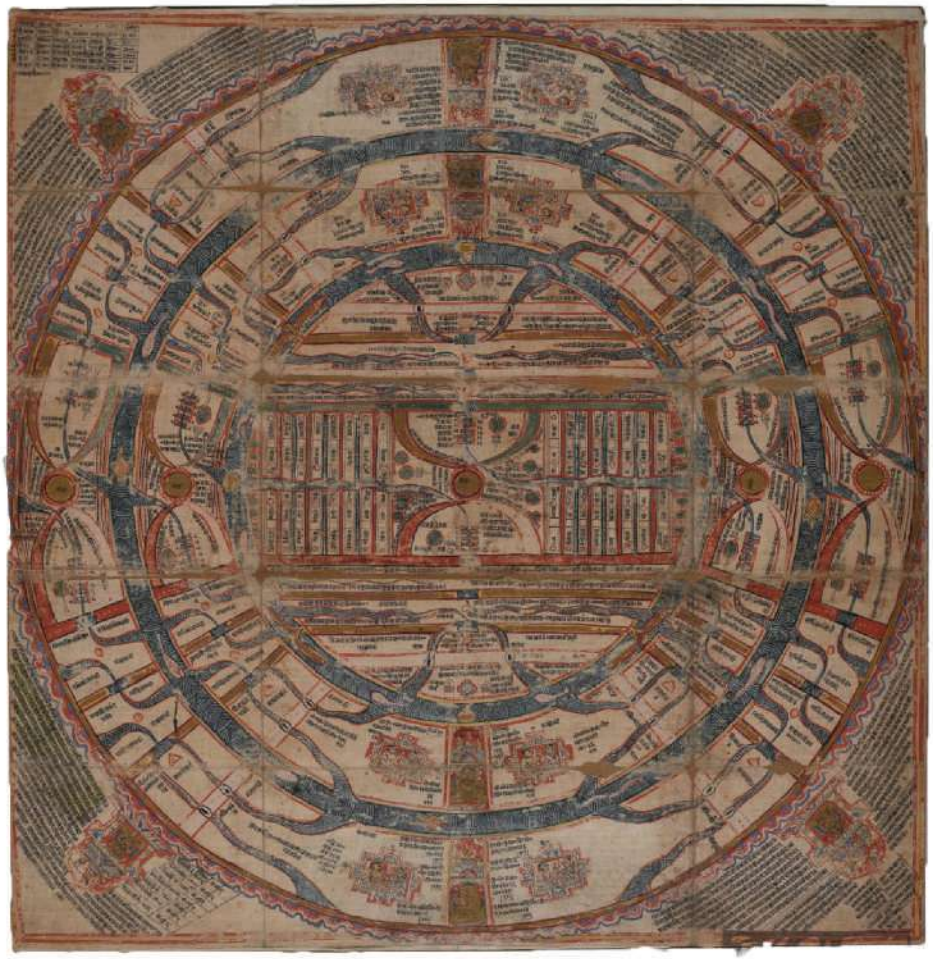
There are a variety of cloth paintings in India such as *Phad, Pichhwai, Pachedi*, *Rogan* in Western India, *Kalamkari* and *Pattachitra* in Eastern India, *Thangka* and cloth paintings on walls in the Himalayan regions. The Tanjore paintings on cloth support pasted on wooden panels are peculiar to that region.

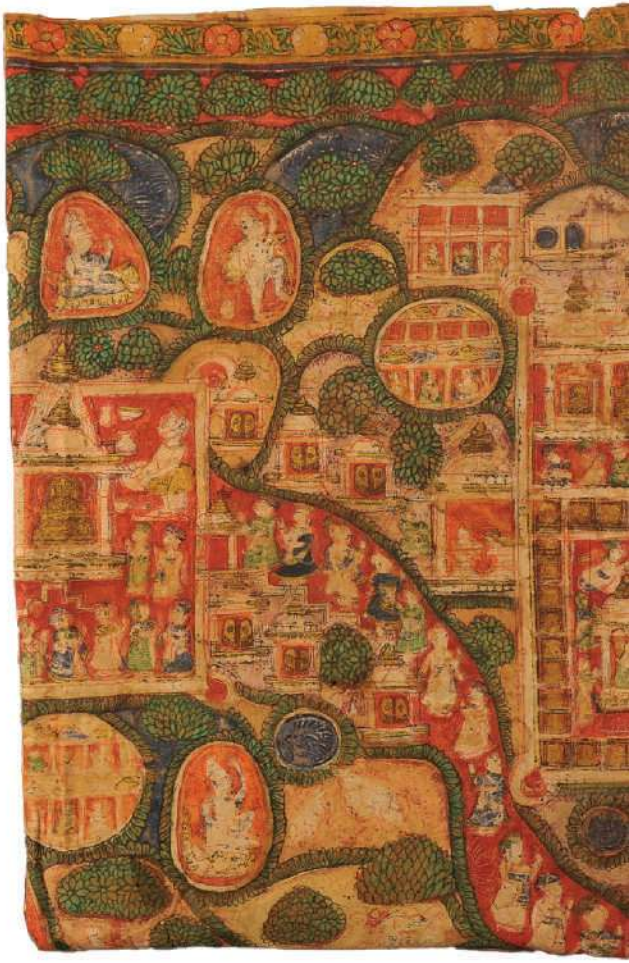
Layers of cloth are pasted on each other, covered with a ground, drawn upon and then painted using pigments and plant gum or diluted glue binders. In Tanjore paintings, rhinestones are stuck on designs on the cloth support with a clayey adhesive. Golden coloured leaf is applied as an embellishment and then remaining spaces are painted.

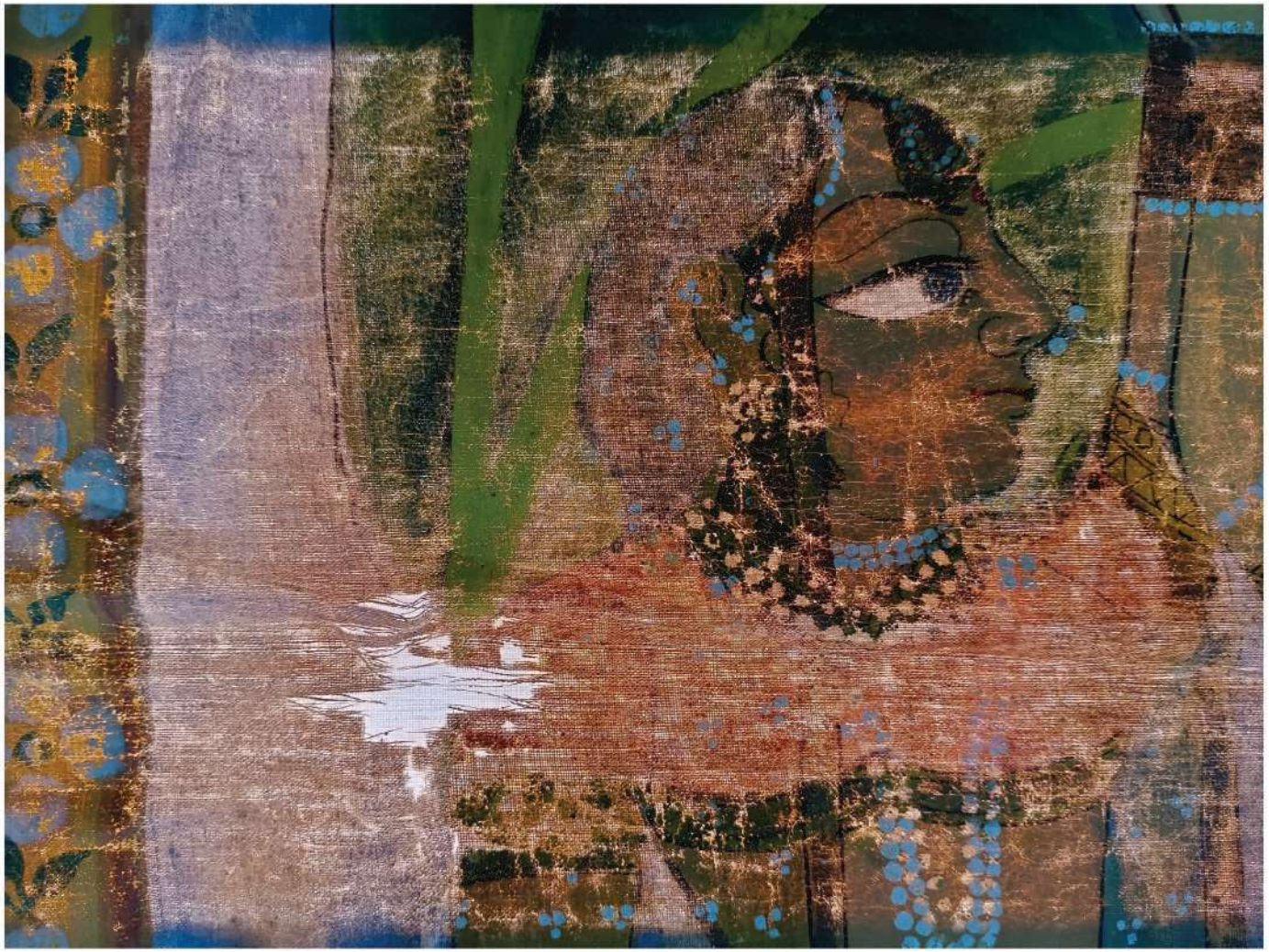
These paintings are often meant to be displayed vertically and are hung on walls either as backdrops for deities, or as accessories to storytelling.











DETERIORATION of Paintings on Cloth

Due to the fragile nature of cloth, dimensional changes caused by fluctuating relative humidity, and the way it is displayed, the paint layers are subject to regular stress and movement leading to formation of cracks, powdering, flaking and loss. Layers of cloth support weaken with moisture and sometimes separate out. Often patch repairs and stitches can be seen in such paintings.

As cloth paintings are often rolled and stored, and sometimes folded, creases are cracks are very common damages. Due to rituals being performed near these paintings, they are often covered with deposits of soot from oil lamps and stains from use of water during worship. In case the wall suffers from water seepage, that causes the cloth painting in contact with the wall to also deteriorate. Light fades away the cloth paintings.

PREVENTIVE CONSERVATION of Paintings on Cloth

The display of cloth paintings should be done in such a way that the stresses on the painting are minimised. If possible, the paintings should be kept in a stable environment. Any powdering or flaking should be arrested by trained conservators.

Cloth paintings can be stored flat with adequate cushioning and support. If rolled, they should be supported in tubes, rolled with the image outwards, with a soft well washed muslin cloth as a separator. Cloth paintings should not be folded.

Ensure that the wall, which the painting is in contact with, is dry, and a separator can be placed behind the painting. Try to maintain low light levels especially in museums where cloth paintings often are unnecessarily exposed to light even when visitors are not viewing them.

DYES

India has a rich tradition of the use of natural dyes and traditional methods of dyeing using plant roots, flowers, and woody material. The use of these dyes has been and still is a vital aspect of traditional textile production.

The primary colour dyes of India include a number of blue dyes including Indigo or *Neela;*

Madder root or *manjishtha*, chay root, sappan wood and lac were employed for reds; and

Turmeric, jackfruit, and *Isparak* were employed for imparting yellow colour.

Dyes are coloured powders that are finer than pigments and dissolve in water. Fibrous materials such as textiles are dipped in them and fixed without or with a mordant.


INDIGO


Textiles

TEXTILES

India has one of the world's oldest living textile traditions, that are an intrinsic part of its identity and culture.

Textile materials include cotton, silk, wool, hemp, and even animal hair that were fashioned into exquisite fabrics and costumes with weaving, embroidery, painting, dyeing, printing, as well as embellishment with metalwork such as *zardozi* or *zari*.

Some household Indian textiles are *Kani* shawls, *Chamba* rumal, *Picchaura*, *Phulakari*, *Banarasi* brocade, *Chikankari*, *Leheriya*, *Patola*, *Ajrak*, *Bandhani*, *Chanderi*, *Maheshwari*, *Paithani*, *Kanjeevaram*, *Sambalpuri*, *Baluchari*, *Pochampally*, *Jamdani*, *Gamocha*, *Moirang phee*, and symbolic weaves such as *Lepcha*, *Khasi*, *Rikutu*, *Risa*, *Rignai* of Tripura, *Naga* shawls, and *Puan* fabrics.


MINISTRY OF CULTURE

DETERIORATION of Textiles

Due to the nature of the yarn, the fibre strength, and the weave, dimensional changes with humidity cause weakening of the cloth. Acidity, detergents, bleaches and other corrosive additives such as dyes play a role in deterioration of textiles. Sunlight fades the dyes and weakens the fabrics.

Metal threads and embroidery in gold, silver and copper result in physical abrasion and tears in the textile fibres, and may also cause staining. Silk materials suffer from shattering, a result of embrittlement of the silk fibre.

A number of insects damage textiles especially during the larval stage of their life cycle.

Creases, folds and improper storage cause immense permanent damage to textiles. Clothes that have been stored unwashed after use deteriorate rapidly due to fungus growth as well as proliferation of bacteria.

PREVENTIVE CONSERVATION of Textiles

Textiles should be cleaned after use and stored in a dry environment with minimum humidity fluctuations. To avoid creases, place a padding of paper or synthetic polyfill at the folds. The textiles should be kept cushioned in acid free boxes, with minimum stacking. For fabrics with metalwork, paper should be placed as separator to prevent snagging. Textiles can be stored on rollers of at least 4 inches diameter with cotton cloth in between the fabric.

Dust from textiles can be cleaned using a low suction with a cloth over the nozzle of the suction tube. Wet cleaning of textiles is a careful process and should be done by trained textile conservators. Textiles should be displayed for limited duration in vitrines to avoid dust, and should be supported well. Lights should be switched off when the textile is not being viewed.


Oil Paintings

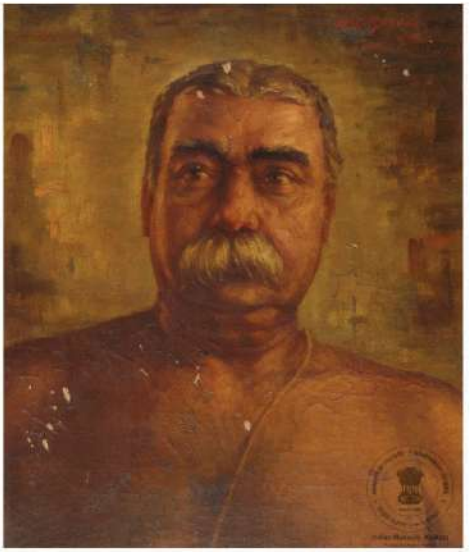
OIL PAINTINGS

The advent of oil paintings in India around the 18th century created a medium that became popular and has now morphed into paintings in acrylic and mixed media.

The traditional structure of oil paintings constitutes of a woven canvas mounted on a wooden stretcher, coated with a ground and then painted with pigments with a drying oil as a medium. Oil paintings were also created on copper sheets, as well as on wooden panels. Over time, these oil paintings were often coated with varnishes to enhance their visual richness.

These paintings were often framed with ornate wooden frames, decorated with stucco and gilding.

Nowadays, artists create paintings with various media on a variety of supports, but oil as a medium on canvas is still most popular. Acrylic paints are gaining popularity too.



DETERIORATION of Oil Paintings

Paintings get damaged due to over-stretching, unbevelled stretchers, and faulty framing.

Over time the canvas may become brittle and dust deposits compound the deterioration. Physical damage such as tears and holes are common. If the ground layer gets damaged due to moisture, paint layers get affected too – they may crack, form ridges, and also flake away and fall off leading to losses.

Other than appearing cloudy or full of cracks (crazing), varnishes often darken with time and change the appearance and contrast of the painted image.

Improper treatment may flatten textures of the paint or make the canvas rigid. Improper choice of materials by artists may initiate deterioration almost as soon as the work is created. High humidity and pollution cause growth of fungus as well as alteration of paint.

PREVENTIVE CONSERVATION of Oil Paintings

Proper framing and stretching of the canvas is essential to ensure proper upkeep of the paintings. Covering the back of paintings with cloth helps to protect it. Avoid stacking paintings against each other.

If the painting is not suffering from flaking paint, then dust from paintings should be removed with a soft brush, and paintings should be covered during storage. Paintings should not be dusted harshly nor wiped with moist cloth.

Proper and planned handling and transport helps to prevent physical damages. Works should be carefully installed with correct hanging systems, and both displayed and stored works should be inspected at regular intervals.

Consult a conservator in case fungus or flaking are visible on the painted surface, and do not attempt to clean the painting.

EXAMINATION OF ART OBJECTS

When an art object is received for treatment, it is first examined to assess the condition of the object and record the damages. The object is examined using light at different angles (raking light), transmitted light, as well as reflected or specular light.

In order to examine details, a conservator takes the help of magnifying glass and stereo microscopes. All damages are written in a condition report and also rendered into a graphic form.

The object is photographed to maintain a visual record of the condition. Sculptures and structures are often documented using photogrammetry and reflectance transformation imaging.

In order to see into the spaces in wall painting plasters or structures, endoscopes are employed.
A variety of tools have been adapted by this field.

ART ANALYSIS

Objects may need to be analysed to detect fakes and forgeries, authenticity, materials and techniques, for dating of artworks as well art historical research.

To carry out detailed investigations, such as identification of the pigments and binders, techniques such as spectrometry and chromatography are employed.

Art analysis is a combination of scientific investigation of artworks combined with art historical and curatorial knowledge. Both the sciences and humanities come together in an effort to understand the physical composition of our cultural artefacts and resolve outstanding issues.

REMEDIAL or CURATIVE CONSERVATION

Once the damages to the object have been identified and the cause of damage has been confirmed, a proposed treatment plan is drawn up by the conservators in consultation with the owner/custodian of the objects, and associated scientists and experts. A work area is set up neatly with all the required tools, equipment and materials.

Art conservators treat the object very carefully, documenting every step of the process and ensuring the work follows accepted principles and ethics of art conservation such as maintaining the authenticity of the object, minimal intervention, reversibility of materials, etc.

Some of the treatment procedures include:
Providing additional support to paintings or manuscripts that are very fragile and in danger of fragmenting;

Treatment of copper disease in bronze sculptures;

Reinforcing wood that has been hollowed out by insects;

Removal of rusting iron dowels that are breaking stone sculptures apart;

Injecting lime-based grouts in order to reattach mural painting plasters that have lost their adhesion with the walls;

Sandwiching textile fragments with translucent nets to ensure they do not deteriorate further;

Removing soluble acids from archival documents;
Consolidating powdering pigments on cloth paintings.

The objective of these treatment procedures is to arrest any active deterioration and preserve the object in its present state so that it can be safely stored, displayed, or employed for education and research.

Remedial Conservation

All actions directly applied
to an item or a group of items
aimed at arresting current damaging processes
or reinforcing their structure.

These actions are only carried out when the items are in such a fragile condition or deteriorating at such a rate, that they could be lost in a relatively short time.

These actions sometimes modify the appearance of the items.

Examples of remedial conservation are
disinfestation of manuscripts or textiles,
deacidification of paper,
stabilization of corroded metals,
consolidation of mural paintings,
removing plants from buildings.

Source: ICOM-CC (International Council of Museums-Committee for Conservation)

RESTORATION

Once active deterioration has been arrested through remedial conservation measures, and the stability of the art object has been ensured, restoration processes are begun if required.

Restoration actions help to re-establish the message that the object is expected or desired to convey. To implement art restoration, first of all, old records of the original state of the object are collected for reference, and based on these authentic records missing elements of an object may be reconstructed only if necessary, or darkened surface coats may be removed revealing original tones underneath.

Art restoration interventions include retouching areas of paint loss, re-assembly of dismantled elements, creating missing parts of an object etc. Such actions have to be very carefully thought of as restoration can often alter the authenticity of the work.

Restoration

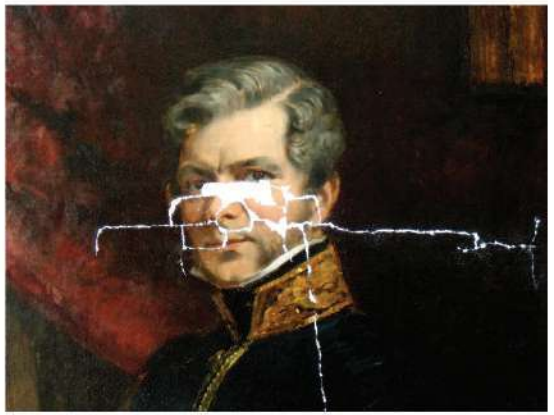
All actions directly applied to a single and stable item aimed at facilitating its appreciation, understanding and use.

These actions are only carried out when the item has lost part of its significance or function through past alteration or deterioration. They are based on respect for the original material.

Most often such actions modify the appearance of the item.

Examples of restoration are retouching a painting, reassembling a broken sculpture, filling losses on a glass vessel.

Source: ICOM-CC (International Council of Museums-Committee for Conservation)



CONCLUDING REMARKS

Today there is new found awareness about the conservation of cultural heritage in the public of rural and urban India, as well as amongst institutions. Resources, political and administrative will are also there.

What we should strive for, together as a nation now, is building awareness through school education and capacity through rigorous university training and skilling programmes, and facilitation of responsibly directed conservation projects that will serve as exemplars of good practices that can be emulated to ensure a mature and respectful approach to preservation of our cultural heritage.

The value of conservation of tangible cultural heritage is being recognised and appreciated across the Indian subcontinent. Indian heritage conservation efforts are also being noticed around the globe.

We need to take up a more responsible role in the preservation of this cultural heritage of the world and the environment appears to be very conducive for building up on the efforts that the pioneers of heritage conservation made in the past century.


MISTRI
LAPS
NTL

THE CONSTITUTION OF INDIA
Article 51 A (f) Fundamental Duties

It shall be the duty of every citizen of India…
to value and preserve the rich heritage of our composite culture.

भारत का संविधान

धारा 51–क (च) मूल कर्तव्य

भारत के प्रत्येक नागरिक का यह कर्तव्य होगा कि ...
वह हमारी सामासिक संस्कृति की गौरवशाली परंपरा
का महत्व समझे और उसका परिरक्षण करे।

CONSTITUTION OF INDIA