

The Causes of Deterioration and Preventive Measures for Traditional Manuscripts



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What are traditional manuscripts?

Traditional Manuscripts are handwritten document in script surfaced in early (4) century till the (19) century. These handwritten documents reflect the rich cultural heritage high intellectual attainment of the Myanmar, covering a wide range of subjects from literature, history, religious Buddhist teachings, medicine and court custom.

Why is it important to preserve traditional manuscripts

Traditional manuscripts are our invaluable documentary heritage of the past which must be preserved because of it being irreplaceable. Due to its contents which offer an abundance of knowledge for the proper understanding of cultural history of the Myanmar and its civilization, therefore it is imperative that these intellectual legacies be preserved and made available for the present and future generations.

Deterioration

Deterioration is a change of original state of any material by interaction between the object and factors of destruction.

Causes of Deterioration of Traditional Manuscripts

- Environmental Factors: light, heat, humidity and moisture, dust and dirt
- Biological Factors: Microorganisms, insects and rodents
- Chemical Factors
- Human Factors
- Disasters

Environmental Factors: light

- Whether natural light or artificial light, cultural manuscripts get deteriorated when it is exposed to light.
- Especially sun light, has a serious damaging effect on manuscripts.
- Light has a bleaching effect.
- It can cause paper (parabike) to whiten and colored paper and ink to fade
- So, light effects the lifespan of traditional manuscripts.
- However the amount of damage by light depends upon the following factors

Intensity of light: as the intensity of light increases the rate of deterioration of the paper also increases.

Duration of exposure : the duration of exposure of paper to light is directly proportional to its deterioration.

Distance from the source of light: more the distance, less the damage.

Environmental Factors: heat

- Usually the source of heat is high atmospheric temperature.
- Heat is measured in terms temperature either in Centigrade scale or Fahrenheit scale.
- High heat with low humidity causes dehydration of cellulose fibers and the manuscripts becomes brittle.
- It loses its flexibility to the extent that it tends to crumble on touch.
- On the other hand, high temperature with high humidity creates the condition for the growth of moulds. (If electric bulbs are used for lighting purpose, they increase room temperature as high powerful bulbs generate more heat.)

Environmental Factors: Humidity and moisture

- Humidity is the amount of moisture in the atmospheric air. The moisture is measured in terms of relative humidity.
- The manuscripts are absorbency properties, especially parabeik absorbs more moisture when there is high humidity.
- Moisture is the root cause of various types of physical, chemical and biological deterioration of cultural manuscripts.
- High temperature and humidity increase the speed of chemical reaction.
- All organic objects absorb water to a greater or lower extent and the water goes inside the object surrounding air.
- Extremely high humidity can cause the manuscripts to stick together.
- Low relative humidity will dry up manuscripts turning it brittle

Environmental Factors: Dust and Dirt

- Fine dry particles of any matter present in the air are known as dust.
- Dust, which is highly dangerous for the manuscripts, composed of soil, tar, metallic substances, fungus spores and moisture among other things.
- Since dust is air borne it settles down on any surface on the manuscripts.
- Dust is hygroscopic in nature and when it is mixed with high humidity, it is transformed into dirt and if this dirt sticks to the surface, it becomes difficult to remove.
- Dust and dirt are sources of both physical and chemical degradation of the manuscripts.
- Dust acts as humidity for the growth of fungus and for chemical reaction, which lead to the formation of acids.
- Dust and dirt are solid particles of varying size and hardness they exert abrasion on the surface of the books.

Environmental Factors: Water

Water is harmful for the manuscripts may come from sources like natural calamities, human negligence, from leaking roofs, defective plumbing and through open windows at the time of raining.

Excessive water brings about biological attack on manuscripts, which is usually manifested as the growth of fungus.

Biological Factors: Microorganisms (Fungus)

- Fungus are a large heterogenous group of plant organisms.
- In libraries fungal growth is known as mould and they appear as brown/ black vegetative growth on paper (parabike)
- Fungus consume cellulose and also thrive on nutrients in paper, they weaken and stain the paper (parabike) and can cause discoloration.
- If palm-leaf manuscripts are kept under air- conditioning fungus will not develop on them, even during the heavy rains of the monsoon period.
- Palm-leaves are normally quite resistant to fungus and fungus is not normally found on them.
- Palm-leaf manuscripts with fungus is sometimes seen in monastic libraries without air-conditioning.
- Mold and fungi grow in warm temperature above 24 C with high moisture (RH above 60%), in dark places with poor air circulation
- They weaken cellulose and cause permanent stains (foxing) on paper and break up the organic cellulose

Biological Factors: insects and rodents

- Insects and rodents are more destructive to manuscripts.
- Insects, rodents, and other pests feed on the records which cellulose and other organic substance. The damage is irreversible.

Chemical Factors

- In the atmosphere among various constituents unwanted materials such as oxides of carbon, sulphur, nitrogen and hydrogen sulphides are also present.
- Because of the absorption of the chemicals by the moisture absorbed by the manuscripts, they get affected.

Human Factors

Apart from physical and chemical factors, a serious cause of deterioration often is the casual attitude of the library staff as well as the users. Librarians in charge of the documentary heritage are directly responsible for the overall conservation and preservation of their collections. But they are not always aware how to handle, store, and use collections carefully to minimize damage and help preservation.

- Humans are a constant threat to archival records through
- Careless or rough handling of manuscripts
- Destructive photocopying practices
- Spoiling manuscripts with hand written notations or remarks
- Mutilation, vandalism or theft
- Inappropriate conservation treatment

Disasters

- Disaster whether arising from human errors or natural events
- These include fires, floods, storms, earthquakes or leaking pipes

Preventive Measures for Environmental Factors

- Sunlight should be prevented from falling directly on manuscripts because the sun is a great emitter of ultraviolet rays.
- The windows must be provided with colored curtains which will prevent falling of direct light as well as absorb ultraviolet rays.
- The UV rays of fluorescent tubes should be filtered by covering the tubes.
- Lights with no UV content such as LED lights are used.
- Archival materials must be protected from ultra-violet and strong light.
- As high humidity and high temperature are more hazardous for manuscripts it is advisable to maintain ideal room temperature (20 C- 25C) and relative humidity of (RH 45- 55%) for preservation of documents.
- Air conditioning of the stack area round the clock is an ideal example of maintaining optimum temperature & humidity for the storage of manuscripts.
- But it is practically not possible for all the libraries to afford for air conditioning for 24 hours.
- High humidity could also be minimized by the use of de-hydrating agents like silica gel.(After the use for 3-4hours the silica gel may get saturated and may need replacement with fresh gels, while the saturated gel can be reactivated for further use after heating it in open pans.)
- The best way is to use a vacuum cleaner because it sucks the dust and can not resettle on the surfaces of manuscripts.

Preventive Measures for Biological Factors

- Provision of cross windows, ventilators, exhaust fans ensures good circulation of air but at times it is necessary to circulate the air inside the room with electric fans.
- It is preferable to avoid contact of books racks with walls (at least 15 cm away from the walls) to eliminate dampness.
- Presence of edibles inside the library should not be allowed.
- Using paradichloro-benzene acts as an insect repellent and insecticide

- Keep naphthalene bricks on the shelves as repels the insects from coming to the book racks.
- Dry neem leaves, neem seed powder and camphor tablets tied in muslin bags should be kept inside the racks for keeping the pests away.
- Integrated Pest Management programme to monitor and treat the entire premises

Preventive Measures for Chemical Factors

- One of the best ways of controlling atmospheric pollutants is filtering of the air intake in to storage areas, which can be attained by air conditioning system operation for 24 hours throughout the year.
- Without this facility simple measures like wrapping the manuscripts in cloth or placing them in containers reduces the effects of pollution to a great extent.
- Good ventilation and air circulation system
- Filtration devices incorporated into air-conditioned system to remove harmful gases, dust, and other particles
- Proper and regular maintenance of systems and replacement of filters
- No chemical spray is allowed in the repositories
- Without this facility simple measures like wrapping the books and manuscripts in cloth or placing them in book containers reduces the effects of pollution to a great extent.

Preventive Measures for Human Factors

- Important manuscripts should keep in specially prepared containers.
- Manuscripts should not be shelved too tightly or too loosely.
- Avoid licking of fingers as an aid to turn pages.
- Underlining must be avoided.
- Staff are trained to handle archives and rare collections.
- Staff are provided with proper and clean gloves and overalls.
- Strictly no food and drinks are allowed in processing areas and repositories.
- Segregation of areas where archival records are handled and stored from staff amenities/facilities.

Disaster Preparedness

- A disaster planning is an essential element of preventive conservation.
- It is also necessary to identify any external and internal threats that might cause problems for the collection and measure to meet those threats.
- Without an existing disaster preparedness plan, the librarians will be unable to act quickly to organize salvage efforts.
- It should be mandatory for every library to have a written disaster preparedness and response plan containing description of emergency procedures, emergency supplies

list, disaster response outline, conservation experts, list of staff volunteers, list of external contacts and names, addresses, home, and work telephone numbers of personnel with emergency responsibilities.

- Use of match stick or open flame and smoking should strictly prohibited inside the library.
- Inflammable materials and chemicals should not be stored inside the stacks.
- The telephone number of the fire office should be visibly and clearly exhibited.
- Install smoke or heat detection system .
- Ensure 24-hour monitoring of fire detection and suppression system.
- Install water detection system to detect any entry of water or water leakage.

Monitoring

- An accurate environment control and monitoring system is important
- Temperature and relative humidity readings are automatically recorded and monitored
- A back-up monitoring system further ensures repository environment is correctly measured and reported
- A screen displays the real time temperature and relative humidity readings in the general office

Conclusion

- There is an old adage that “ Prevention is better than Cure ”.
- So, save our traditional manuscripts for the future.